Logan

E N G I N E E R I N G

DATA BOOK

No. 103–R2

Conveyors

The Logan Co. Engineering Data Book for Conveyors

When I joined Logan Company in Louisville KY in 1978, about 500 people were employed and Logan was one of the largest conveyor system and component manufacturers in the US. As I progressed from Engineering to Proposal Engineering, then to International Sales, I heard that if you could get your hands on a copy of the Old Logan Data Book, you should not turn loose of it because it had a wealth of good engineering information on the various types of conveyors Logan produced. Conveyors haven't changed much in the past 75 years or so.
Sadly, Logan Co. went out of business in about 1991, 26 years ago, and the Logan Team went their separate ways and many are now retired or no longer living. 1stSource Products Inc. sells the Logan Bearing product line, Conveyor Rollers and the Logan round tube overhead conveyor that we acquired about ten years ago and renamed E-Trac Lite.

Partly out of nostalgia and partly a simple effort to provide useful information to our Customers, we are making what used to be a precious well-worn tome available for free download. Hopefully it will be interesting and useful again to "Conveyor People" of all ages. But, if you need any Logan equipment now that Logan Co. is long gone, don't hesitate to contact us at 1stSource and we will do our best to meet your needs.

Sincerely Yours,

Don Sandusky
President, 1stSource Products Inc. Jan. 2017

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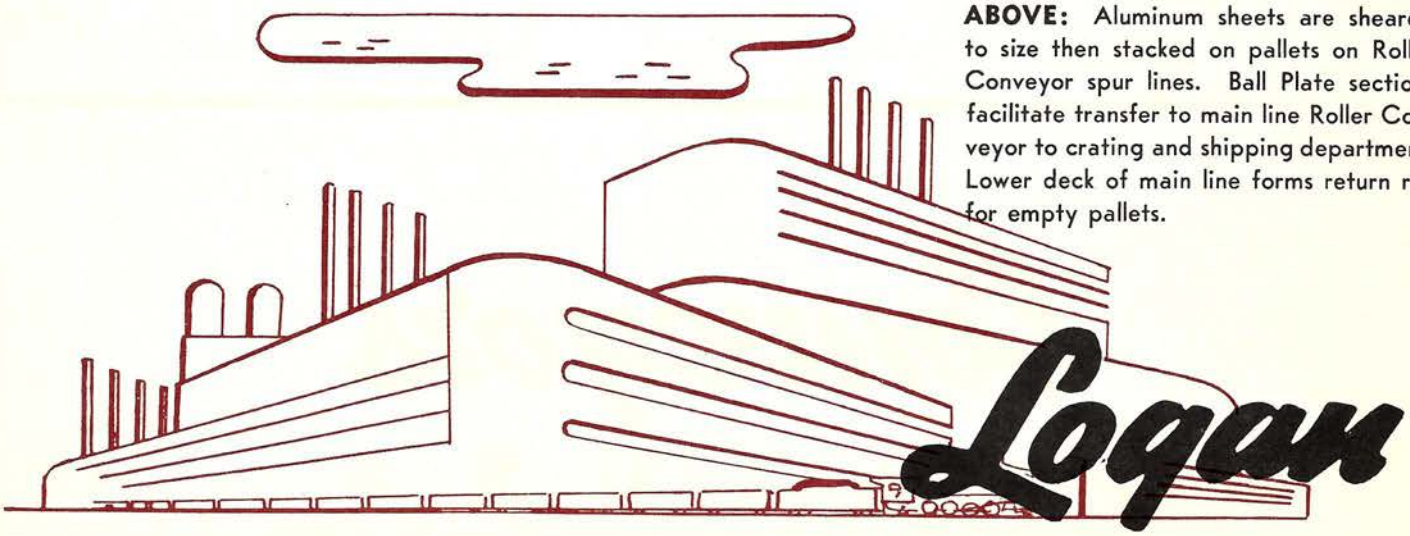
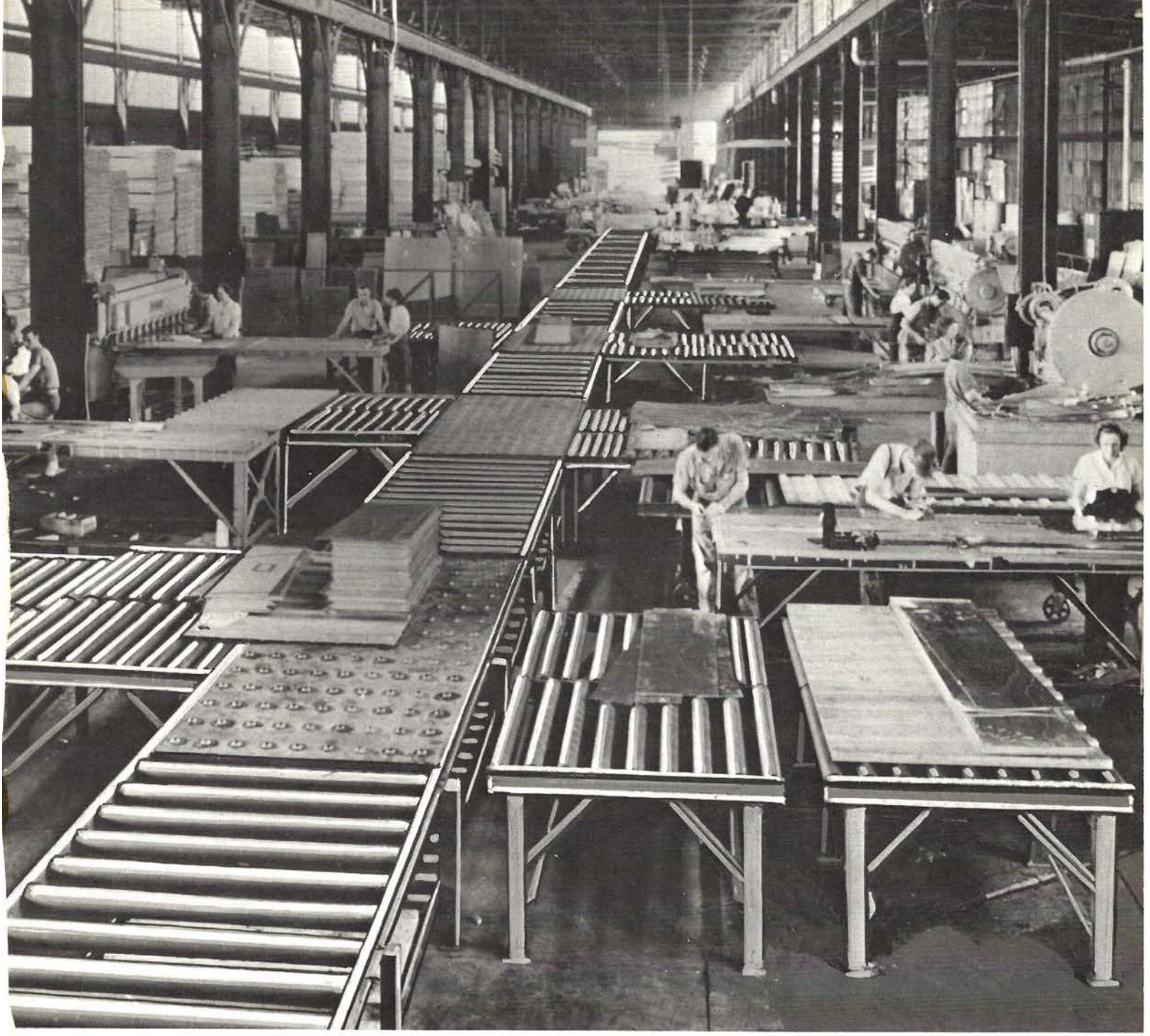
LOGAN CO., LOUISVILLE, KY. 40206

ABOVE: Aluminum sheets are sheared to size then stacked on pallets on Roller Conveyor spur lines. Ball Plate sections facilitate transfer to main line Roller Conveyor to crating and shipping department. Lower deck of main line forms return run for empty pallets.





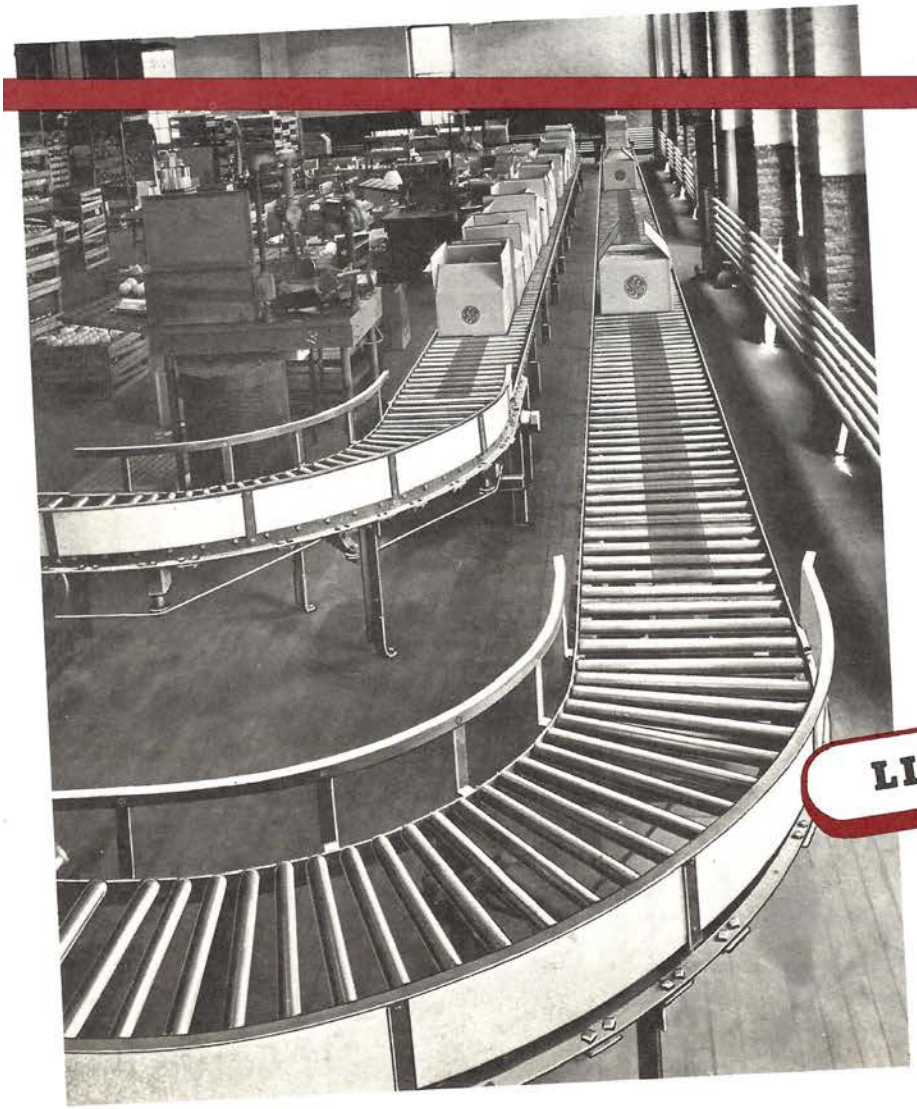
THE selection, coordination, and layout of the correct types of handling equipment to meet individual conditions—are subjects for the experienced conveyor engineer.

The data contained in this book is presented as a guide to your own engineers in planning your conveyor requirements. In addition Logan offers a consulting service based on competent, intelligent engineering, both in the field and at headquarters, backed by more than fifty years' experience in the conveyor business.

CONVEYORS

ROLLER CONVEYOR

ABOVE: Roller Conveyor can be used for handling or storing almost every type of article or container. The initial cost is comparatively low and the maintenance expense negligible. Careful selection of the proper type of Roller Conveyor, however, is important to satisfactory operation. This system of straight and curved sections handles veneer in large midwestern mill. Openings between sections at various points permit passageway through conveyor lines.



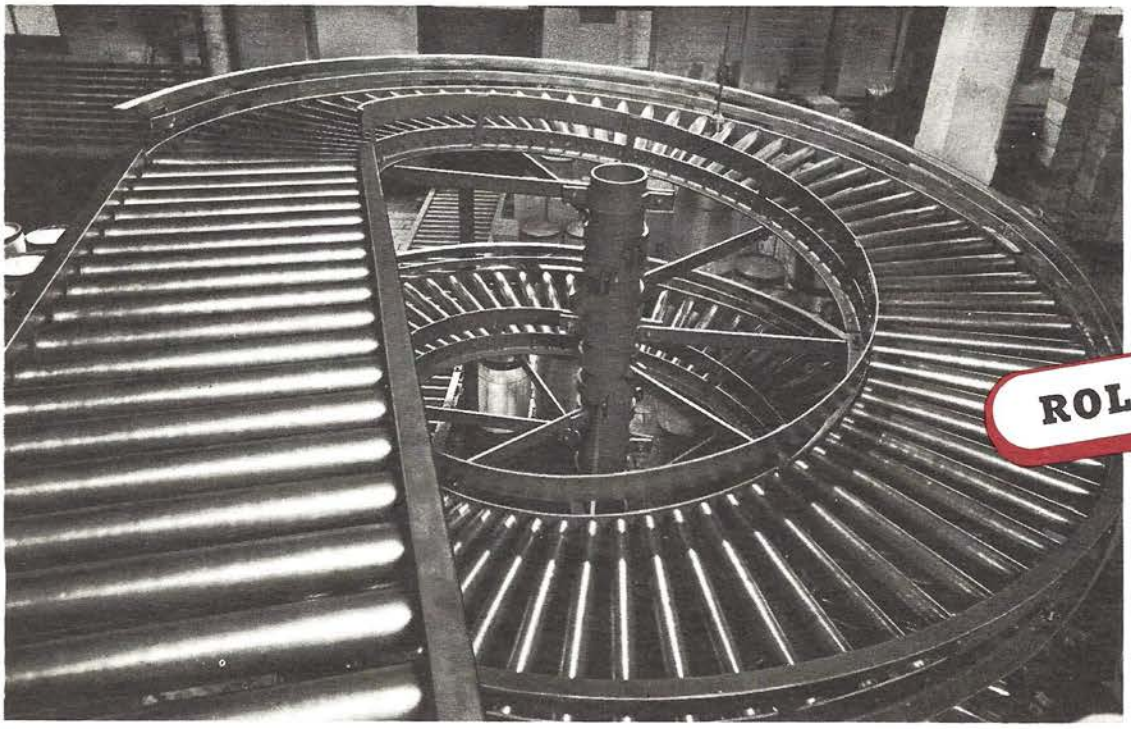
LIVE ROLLER

LEFT: Live Roller Conveyors consist essentially of Roller Conveyors on which rolls are actuated from beneath by a continuous belt. Necessary driving friction is maintained by tension rolls under belt. These two level Live Roller Conveyors handle cartons of electric light bulbs. The shadow down center of rolls indicates position of belt below. The rollers in curve are also powered and other similar units circle the entire room.

BELT CONVEYOR

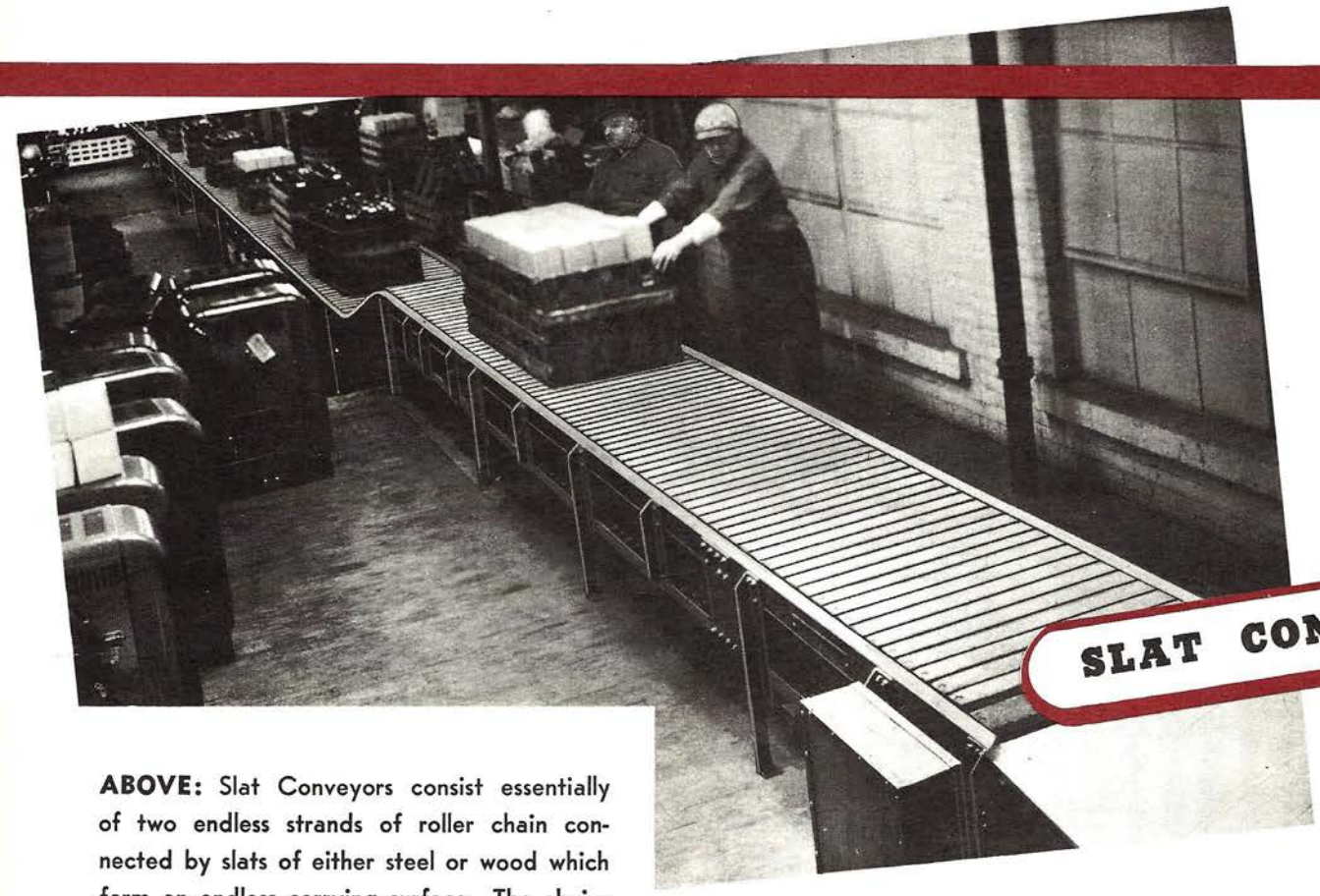
ABOVE: Flat Belt Conveyors are furnished with belt supported on ball bearing rolls of the regular gravity type or on wood or steel slider bed. Can be horizontal or inclined or combination of both. In this installation, handling fluorescent lamps, the conveyor in foreground is a declining Belt from second floor discharging onto horizontal Belt Conveyor at left. This extends through packing department and on to warehouse and shipping at rear.

BELOW: Roller Spirals offer the safest means of lowering by gravity. Operation at small pitch and comparatively slow speed virtually eliminates possible breakage. Also permits handling tote pans and open top containers without spillage. Frequently used for "live" storage. This Logan Roller Spiral speedily and efficiently lowers kegs of nuts, bolts and heavy hardware from packing room on floor above to storage area on first floor.



No freight elevator delays and no power required.

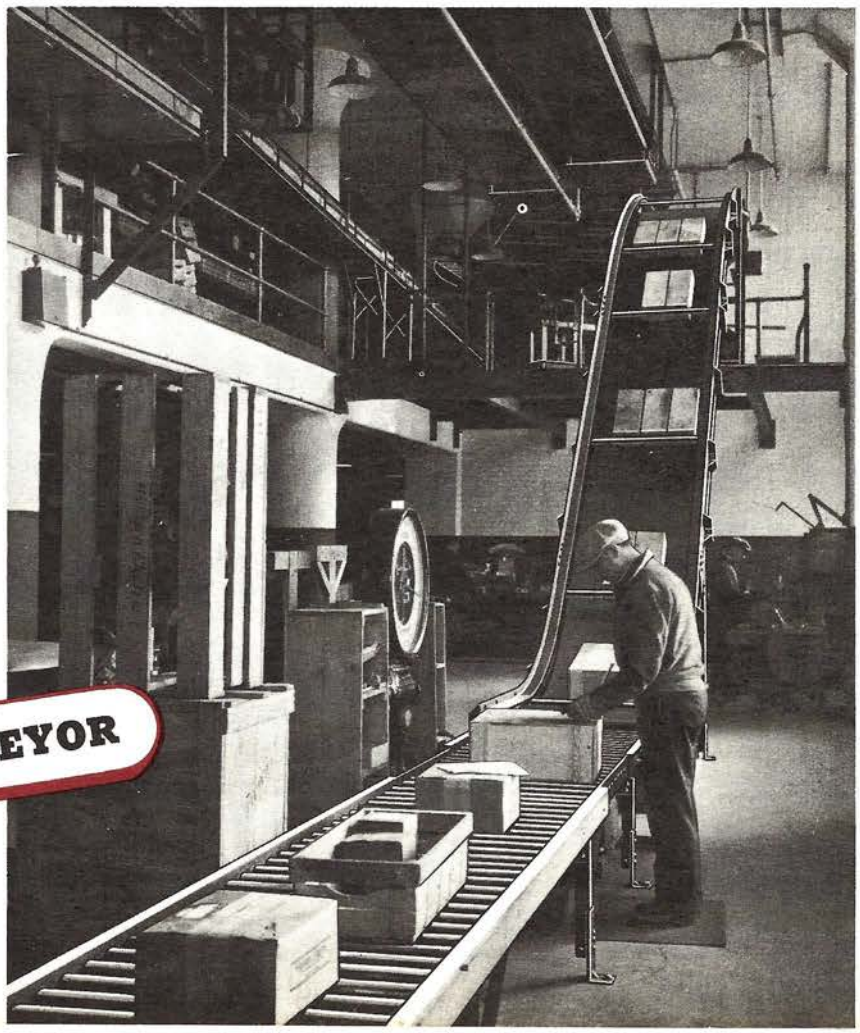
ROLLER SPIRAL



SLAT CONVEYOR

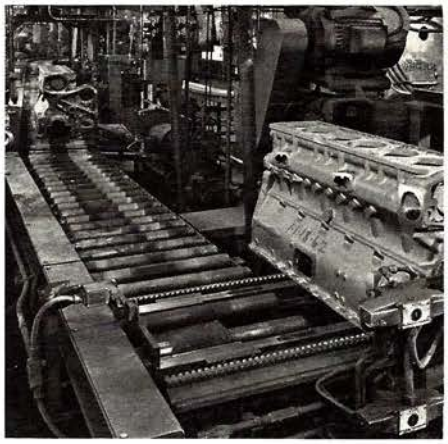
ABOVE: Slat Conveyors consist essentially of two endless strands of roller chain connected by slats of either steel or wood which form an endless carrying surface. The chains roll on steel angle runways. This Slat Conveyor in nationally known stove plant moves heavy baskets of small parts from a sub-assembly department to the main assembly line for assembling onto stove chassis.

RIGHT: Pusher Bar Conveyors are generally used for elevating at angles of 30° or over. Packages slide on stationary bed and are impelled by pushers mounted between two chains. The bed is ordinarily of sheet steel and the pushers usually ball bearing rollers. Loading and discharge are automatic. Pusher Bar at right dispatches electrical supplies from weighing to shipment.



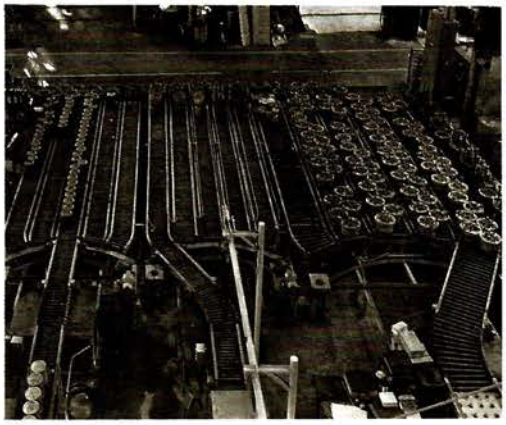
PUSHER BAR CONVEYOR

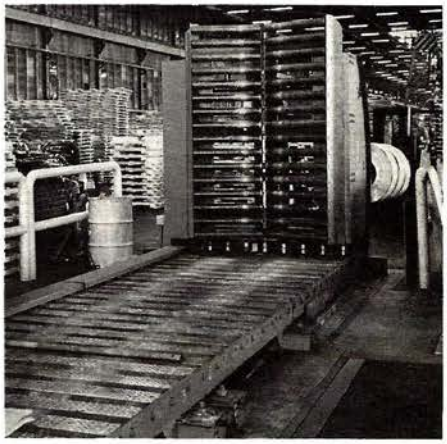
Total Responsibility



Total Responsibility for your engineered conveyor system is the goal of Logan Co. We can achieve this through an organization with:

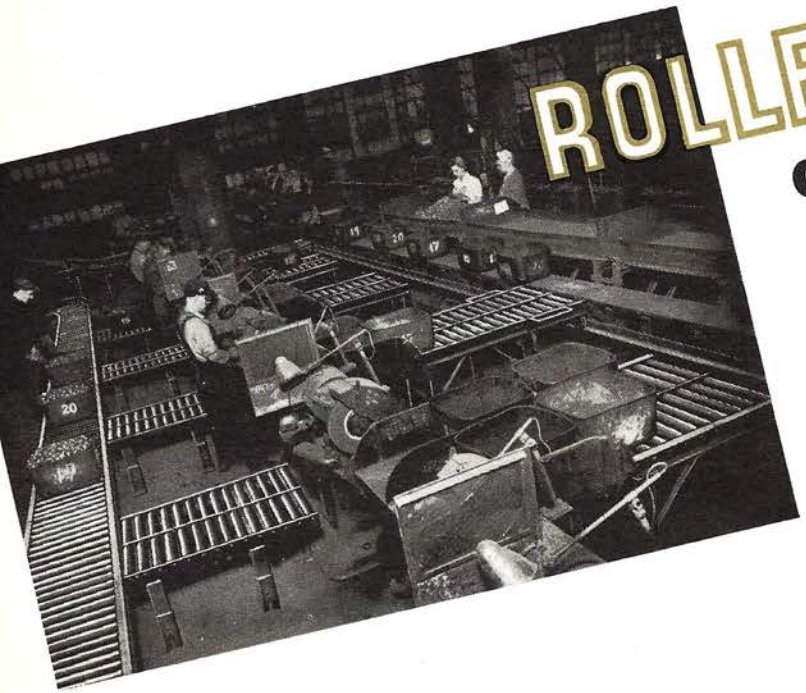
- The experienced understanding to conceive the best system, responsive to all of your material handling requirements.
- The ability to demonstrate with our proposal that we have the solution before you purchase the hardware.
- The devotion to detail necessary to insure that the equipment is in place on time.
- The facility to maximize the effectiveness of the hardware system by designing operating procedures to best implement it.
- The continuing concern for system performance through follow-up procedures intended to spot difficulties before they occur, even after run-in and final acceptance.



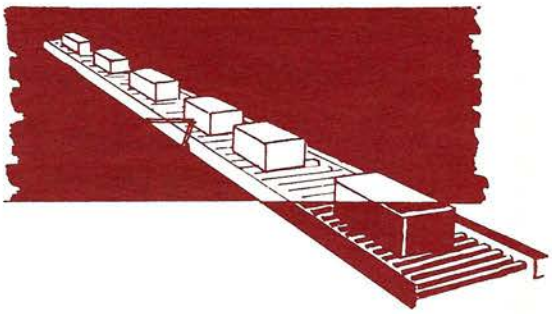


Logan Co. has an experienced team which deals every day in the design, manufacture and installation of solutions to material handling problems.

ROLLER CONVEYORS



CONVEYING by gravity affords the simplest and most economical means of handling wherever practical. Logan Roller Conveyors are available in a wide range of types and sizes, permitting the selection of a conveyor adapted to the exact requirements of each job. This, in a large measure, is the secret of the satisfaction and long life which habitually attend the use of Logan Conveyors.

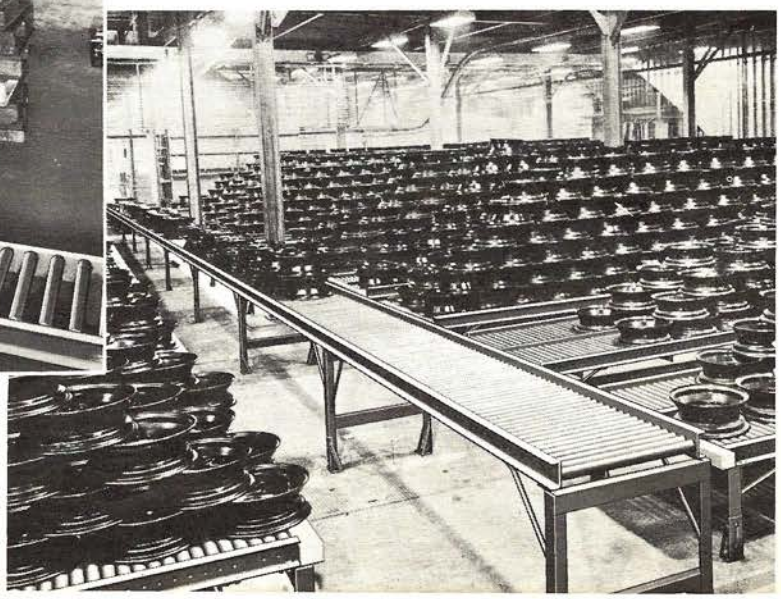


ABOVE: Battery of grinding machines served by Logan Roller Conveyor. Bearings in rolls are dust-protected type.

LEFT: Marking and stenciling bundles for shipment is simplified with Roller Conveyor.

Logan Roller Conveyors feature rigid welded frames — hexagon shafts — bearings in protected position — rugged construction and mechanical excellence—dust-protected bearings—pressure lubricated bearings.

LEFT: Line of Roller Conveyor handling tote pans filled with lock nuts in process. Tote pans facilitate handling small articles and irregular shapes.



RIGHT: Roller Conveyor storage lines for automobile rims. Line through center handles rims to and from storage.

HEXAGON SHAFT ADVANTAGES

The Logan Hexagon Shaft affords the simplest as well as the most positive means of locking the shaft and inner bearing race against rotation. The shaft may be quickly removed from either side of the frame — an important feature if conveyor is against a wall or in cramped quarters, because shaft must be withdrawn to remove bearings for cleaning or replacement.

The hexagon shaft is mounted in the frame with flat sides horizontal — for maximum strength. The ordinary round shaft is supported in the frame in a round hole of larger diameter than the shaft. This means a single point of support as compared with flat side of the hexagon in the Logan construction.

DUST-PROTECTED BEARING

The Logan Dust-Protected Bearing (patented), unless packed with grease, revolves just as freely as a plain bearing because it has no felt washers. The outer shield, which is fixed to the stationary inner race of bearing, does not touch any rotating part. In a reasonably dry atmosphere, excellent results are obtained with no lubrication whatever.

LUBRICATED-FOR-LIFE BEARINGS

Constructed similar to the Dust-Protected type including same labyrinth outer seal, but with an added built-in inner seal. Bearing is pre-lubricated during assembly with a special long-life grease.

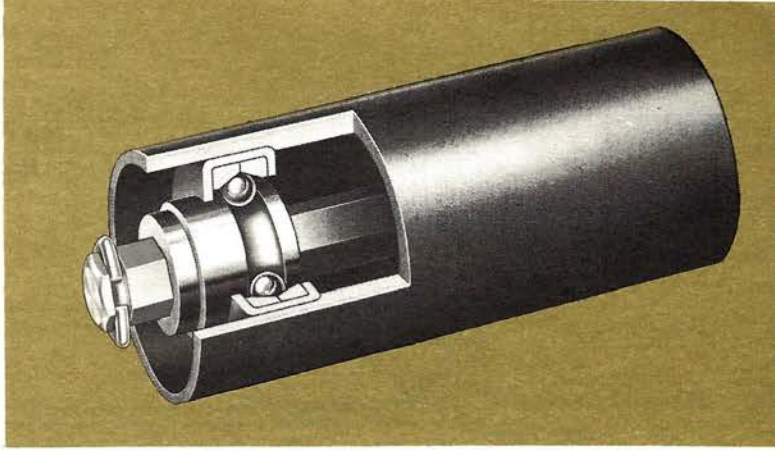
The Lubricated-for-Life Bearing is recommended for power driven rolls as used in Live Roller or Belt Conveyors. Also suitable for push line Roller Conveyor, but not for Gravity lines. Do not use this construction in areas where there is grit or dirt, as this type has no provision for cleaning or regreasing as with the Pressure-Lubricated Bearing.

PRESSURE-LUBRICATED BEARING

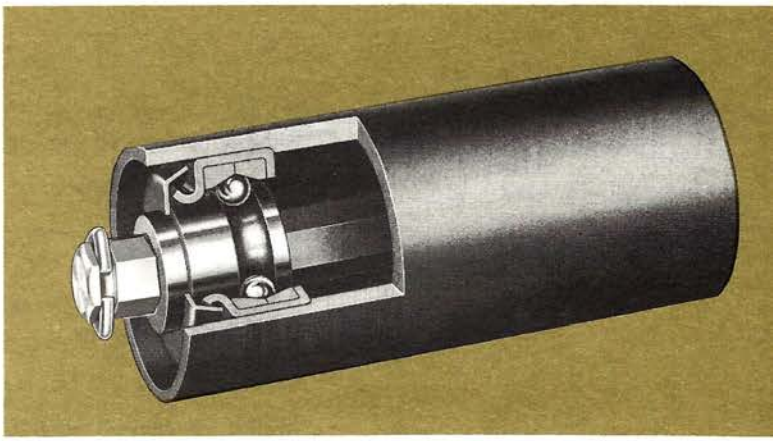
The Logan Pressure-Lubricated Construction is similar to the Dust-Protected, with the addition of a grease chamber behind the bearing plus a grease duct and pressure fitting in the shaft. The floating cup in rear of chamber (patented) prevents entry of grease into interior of roll. As new grease is applied under pressure, this floating cup is forced firmly against the inner cup, sealing this end. The floating cup has a small amount of play between inner cup and bearing and when the roll starts to revolve in operation, the surfaces of both cups being grease covered, the floating cup moves laterally on the shaft enough to clear the inner rotating cup.

The fresh grease, delivered under pressure to rear of bearing, forces the old grease out of bearing and out around the periphery of outer shield. The grease itself forms an effective seal. The superiority of this arrangement over any scheme which delivers fresh grease to one side of bearing only, with no provision for replacing the old grease at each regreasing, is obvious.

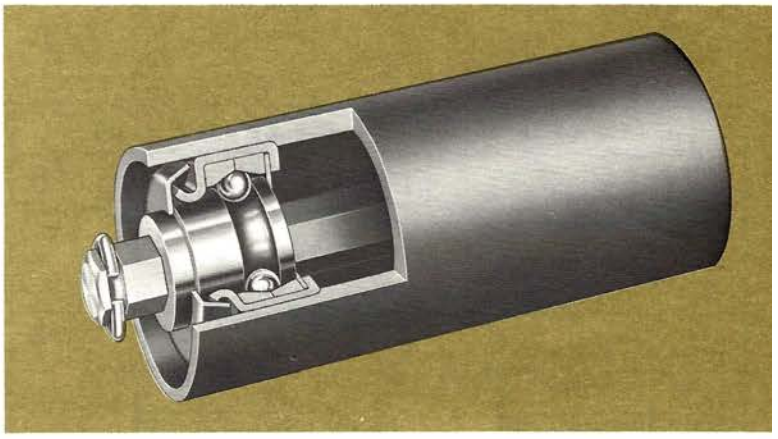
The all-steel seals of Logan Pressure-Lubricated bearings give complete protection with minimum friction loss. The life of the sealing members is indefinite; there are no felt washers to harden, or shrink, or wear, and require replacement.



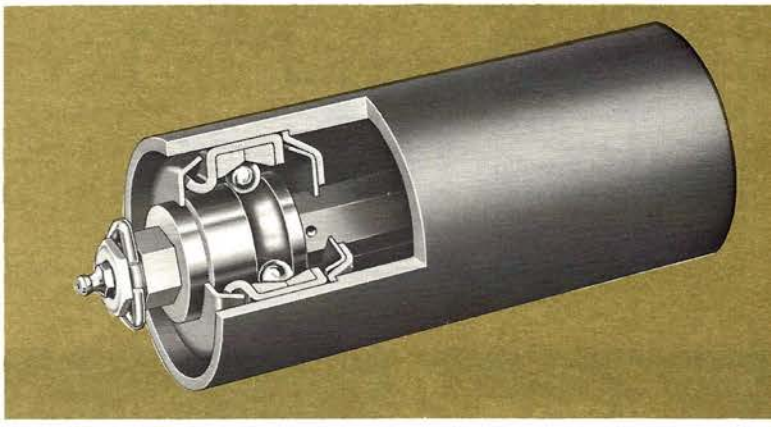
PLAIN BEARING



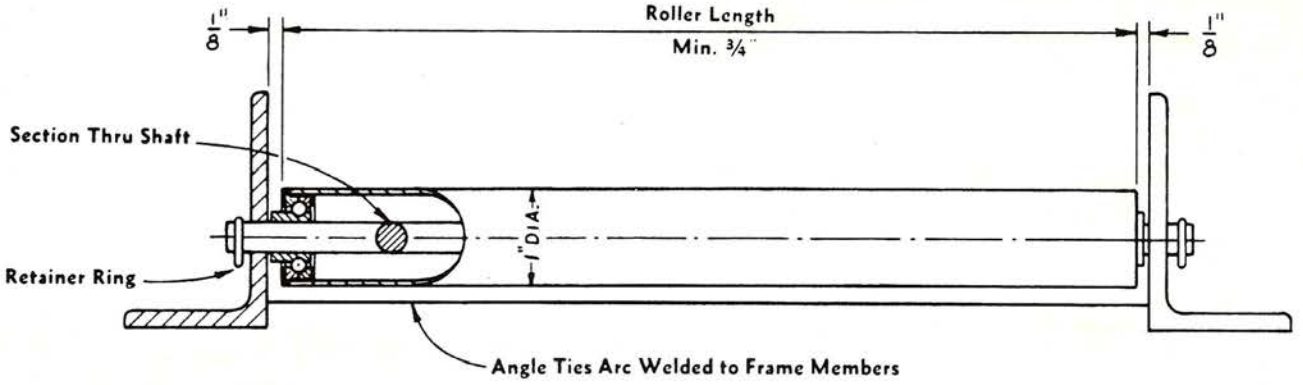
DUST-PROTECTED BEARING



LUBRICATED-FOR-LIFE BEARING



PRESSURE-LUBRICATED BEARING



ROLLER — 1" O. D. No. 18 Ga. Welded Steel Tubing. Reamed to receive bearing.

SHAFT—5/16" Diameter Rolled Steel.

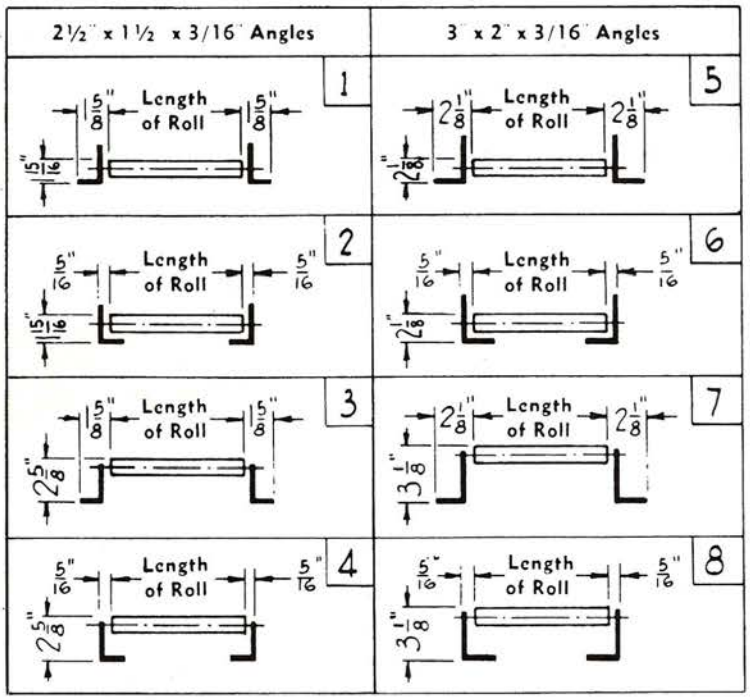
BEARING—No. 7. Slip fit in tubing, easily removed and replaced.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race bored to fit on round shaft.

11–5/32" Hardened Steel Balls.

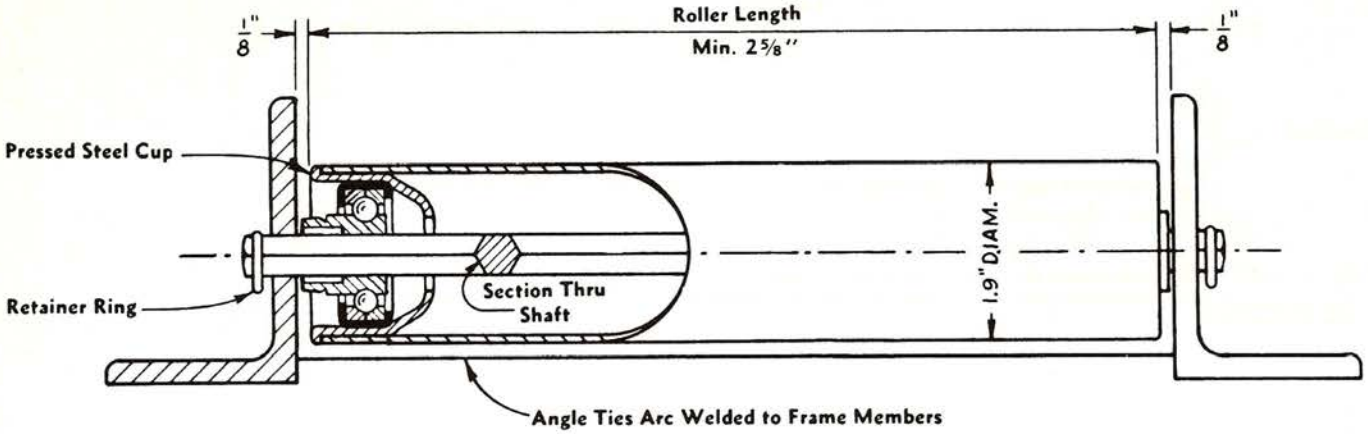
Pressed Steel Outer Casing.



CAPACITY

GRAVITY LINES
40 LBS. PER ROLL

PUSH LINES
60 LBS. PER ROLL



ROLLER—1.9" O.D. No. 16 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

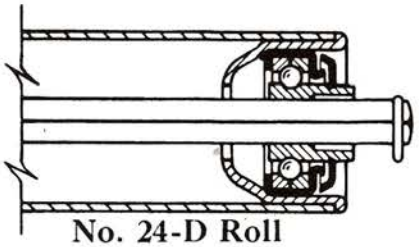
BEARING—No. 50. Slip fit in cup, easily removed and replaced.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12-1/4" Hardened Steel Balls.

Pressed Steel Outer Casing.



No. 24-D Roll

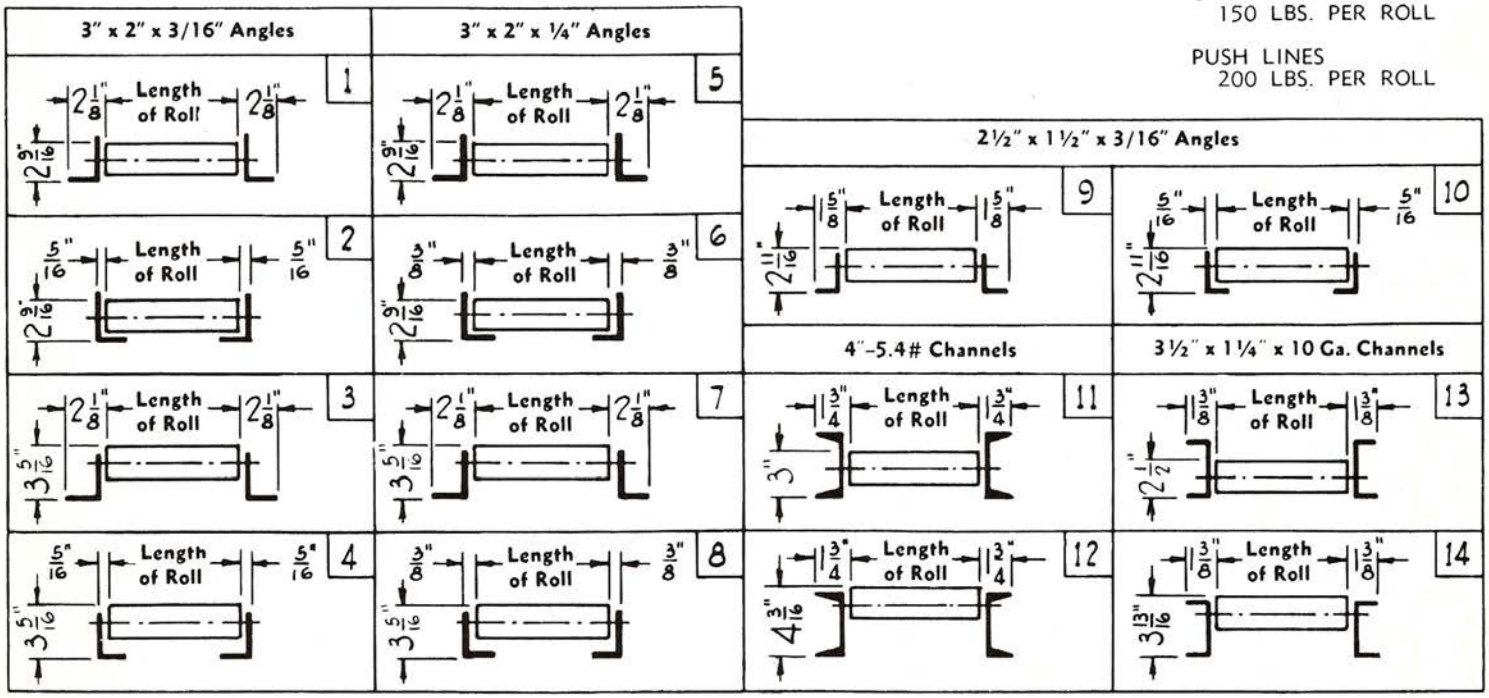
DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

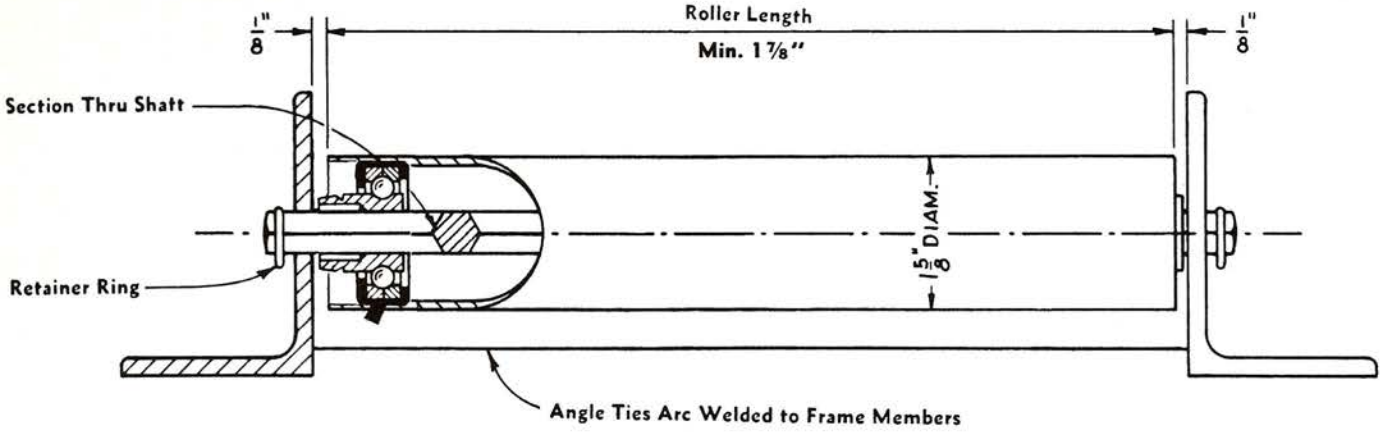
PRESSURE LUBRICATED ROLL—(No. 24-L Roll) Similar to No. 3-L on Page 15.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL





ROLLER—1⅝" O.D. No. 13 Ga. Welded Steel Tubing. Reamed to receive bearing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

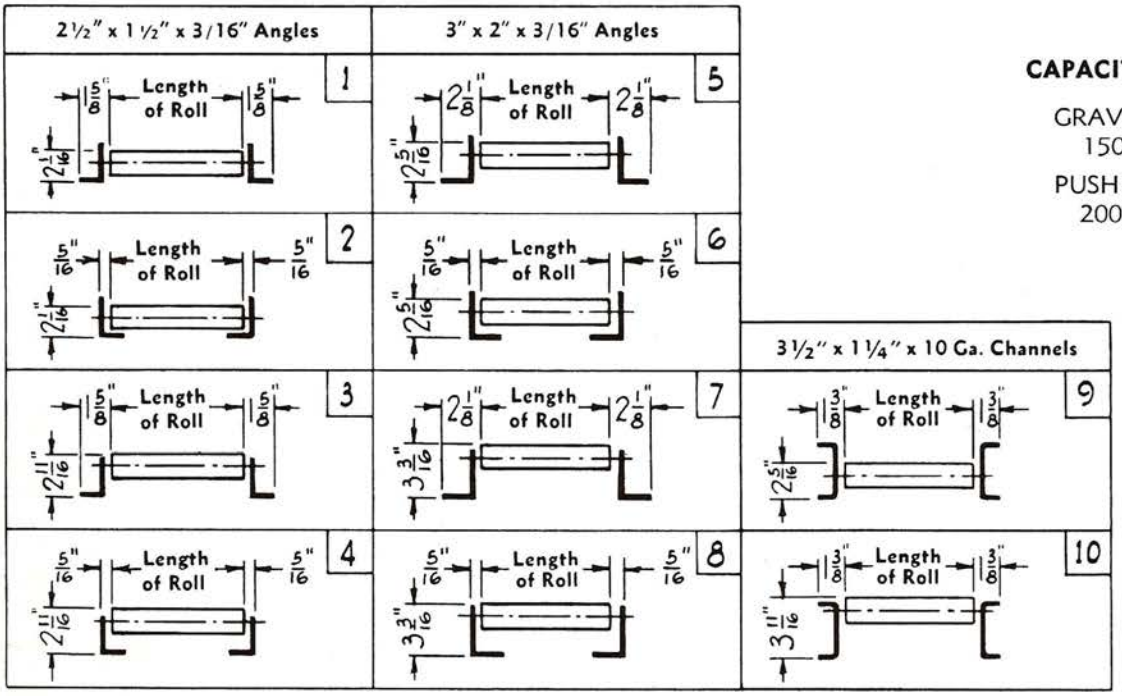
BEARING—No. 50. Slip fit in tubing, easily removed and replaced.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

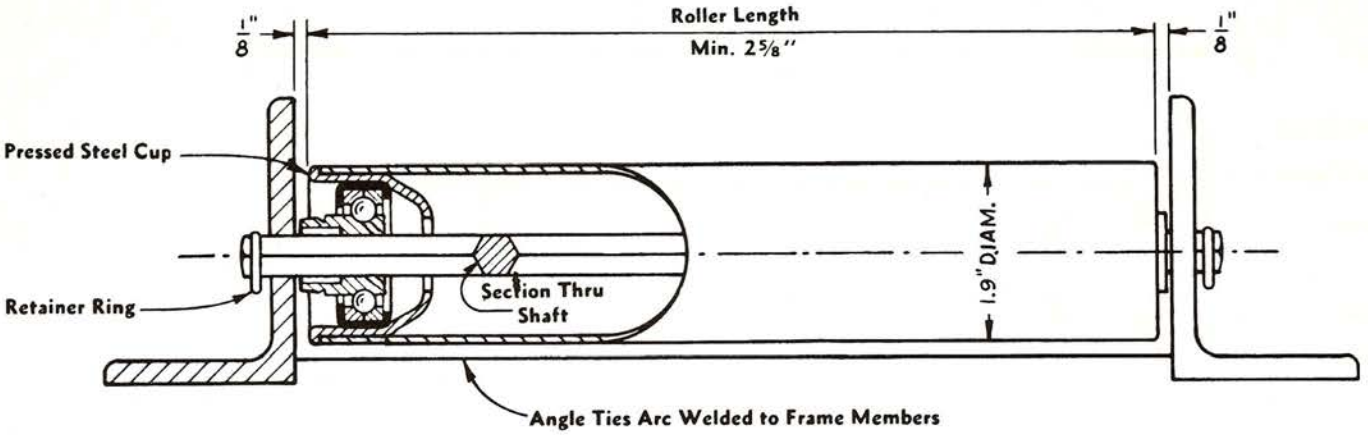
Pressed Steel Outer Casing.



CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL



ROLLER—1.9" O.D. No. 12 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

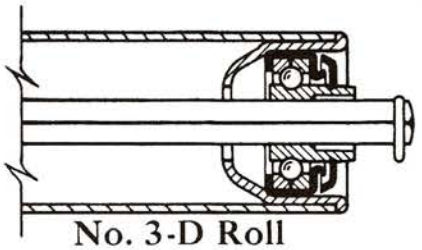
BEARING—No. 50. Slip fit in cup, easily removed and replaced.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.



No. 3-D Roll

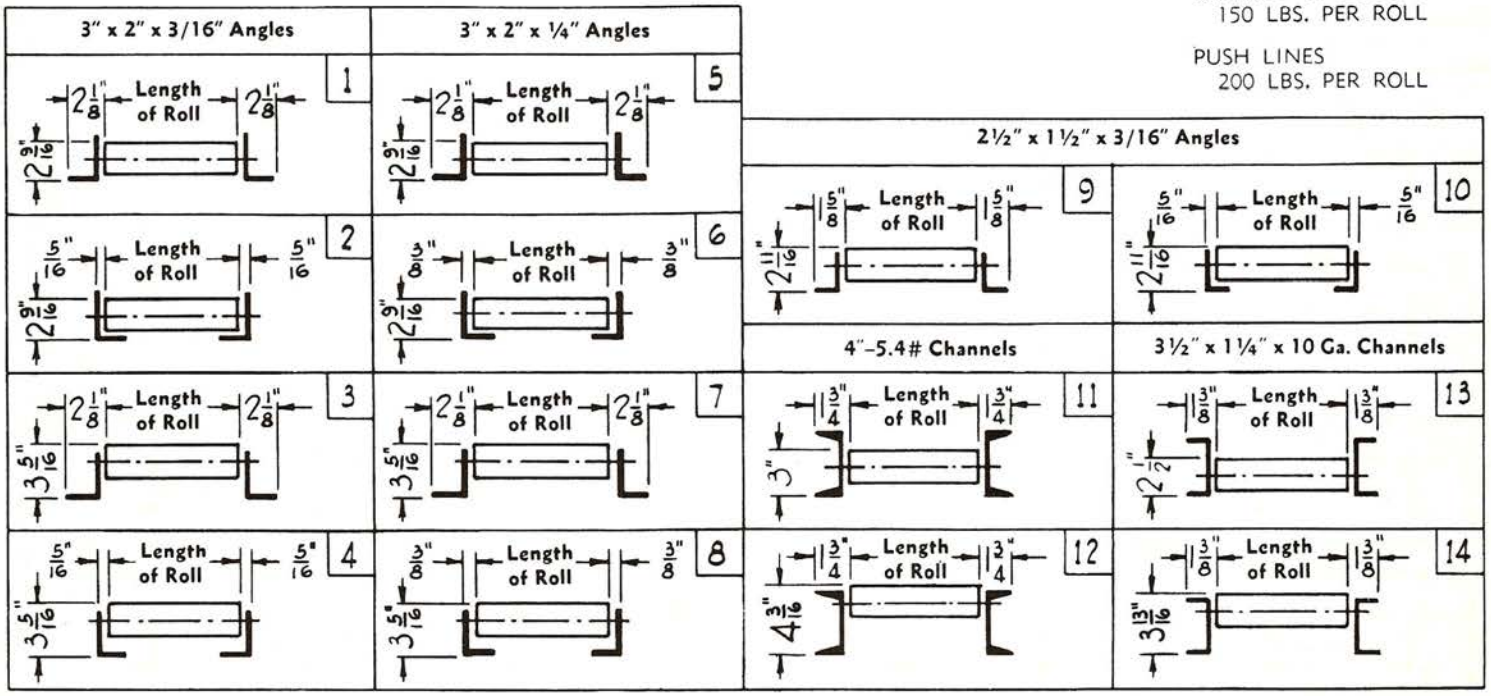
DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

PRESSURE LUBRICATED ROLL—(No. 3-L Roll) See Page 15.

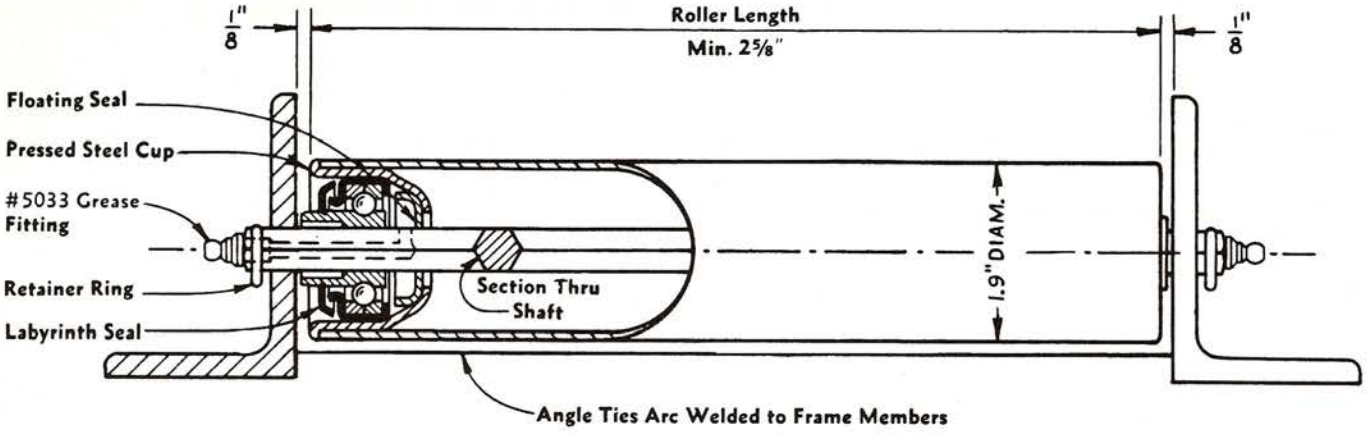
CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL



Logan Co.
LOUISVILLE, KENTUCKY 40206



ROLLER— 1.9" O.D. No. 12 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50-D. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–1/4" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

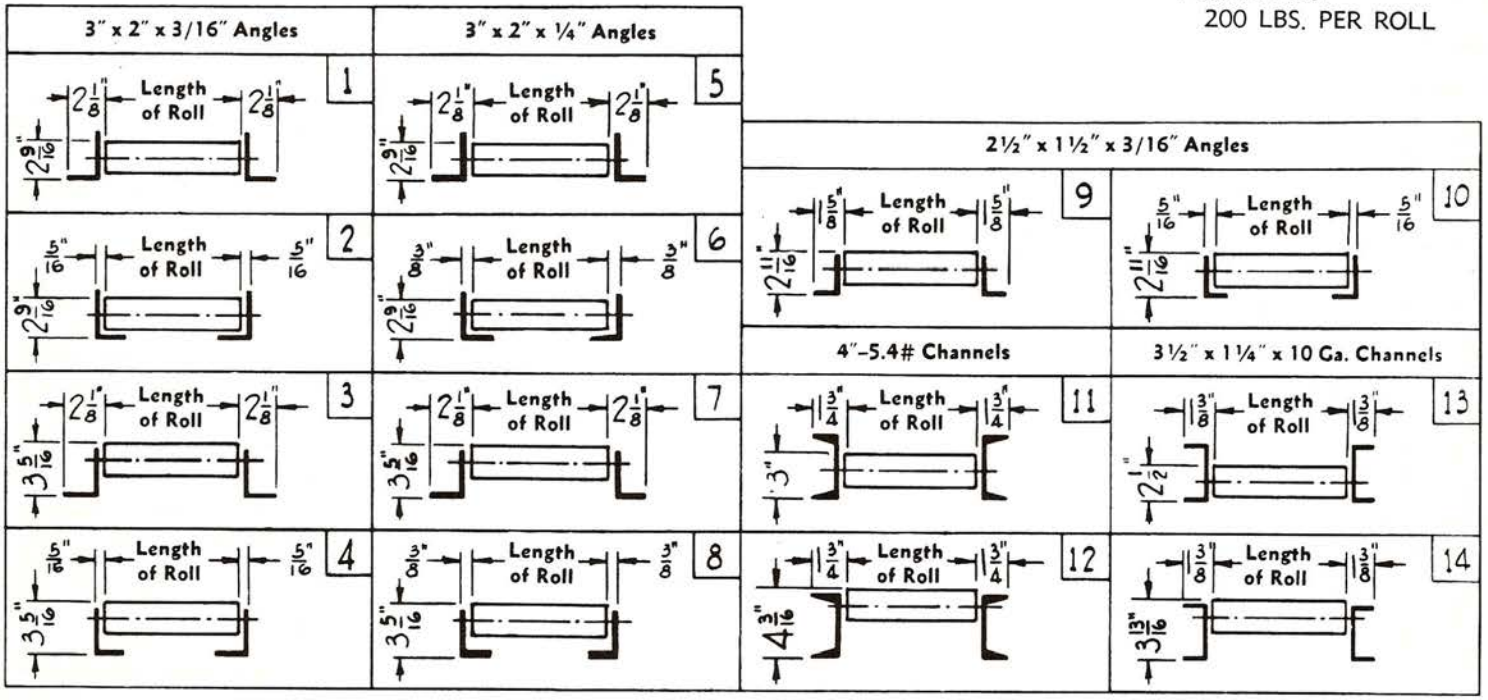
GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

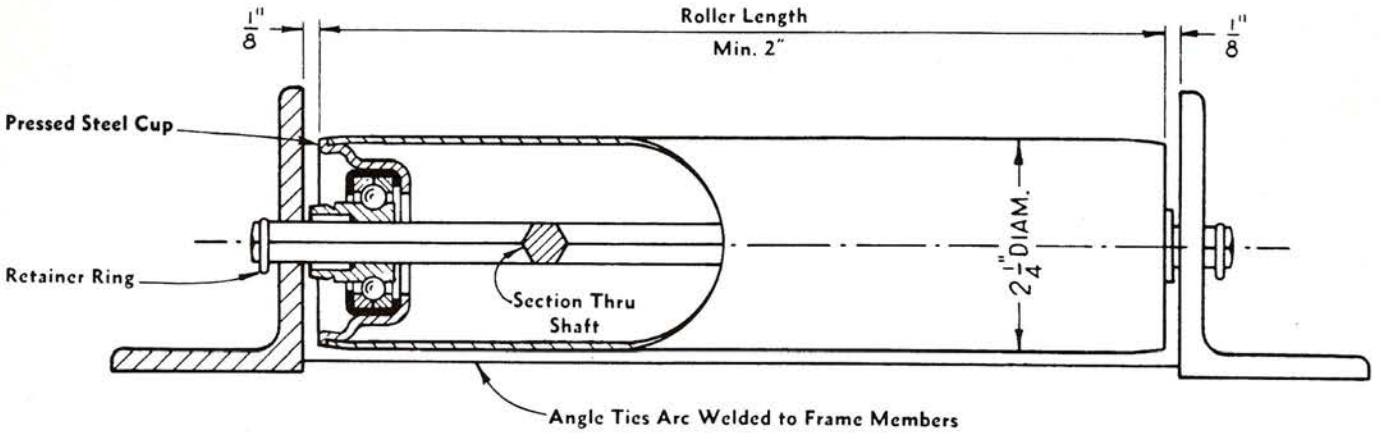
DUST-PROTECTED ROLL—(No. 3-D Roll) has the same No. 50-D bearing with outer Labyrinth Seal but without lubricating duct or Floating Seal in rear of bearing. See Page 14.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL





ROLLER—2¼" O.D. No. 16 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

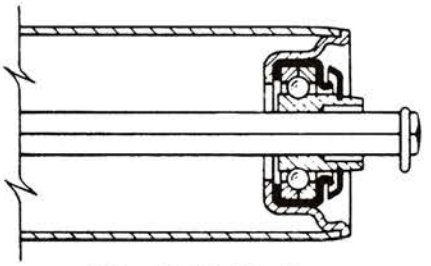
BEARING—No. 50. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.



No. 5-D Roll

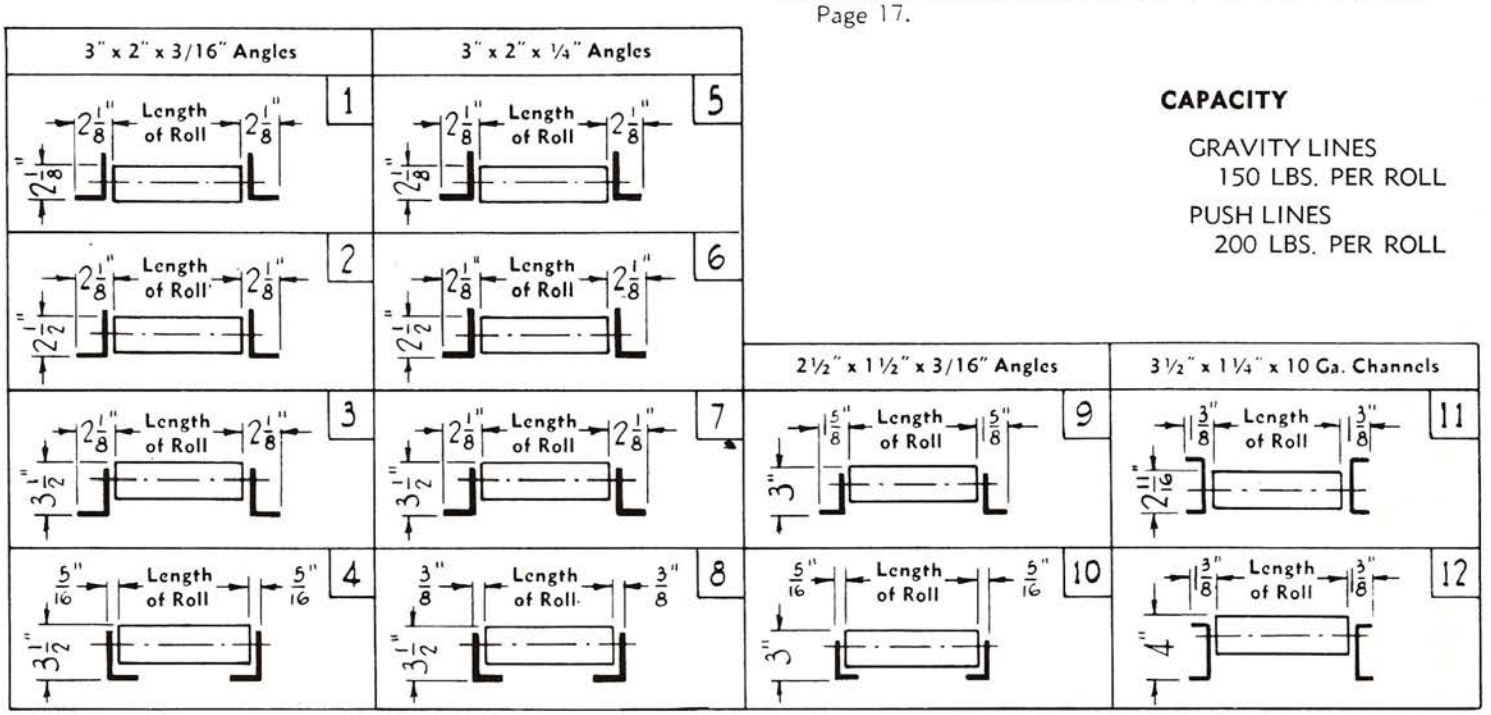
DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

PRESSURE LUBRICATED ROLL—(No. 5-L Roll) See Page 17.

CAPACITY

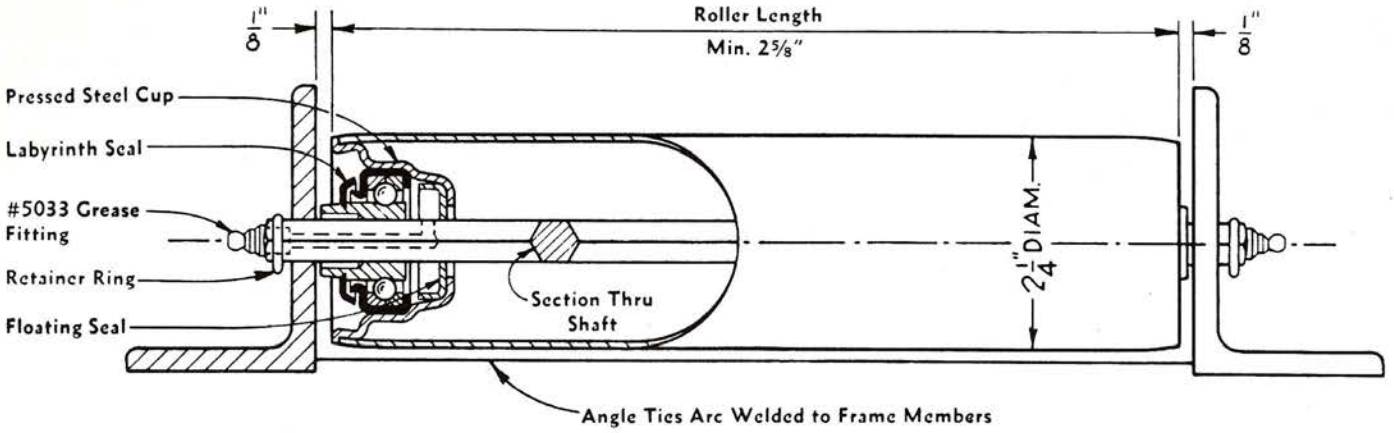
GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL



Logan Co.
LOUISVILLE, KENTUCKY 40206

No. 5 Roll



ROLLER—2¼" O.D. No. 16 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50-D. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

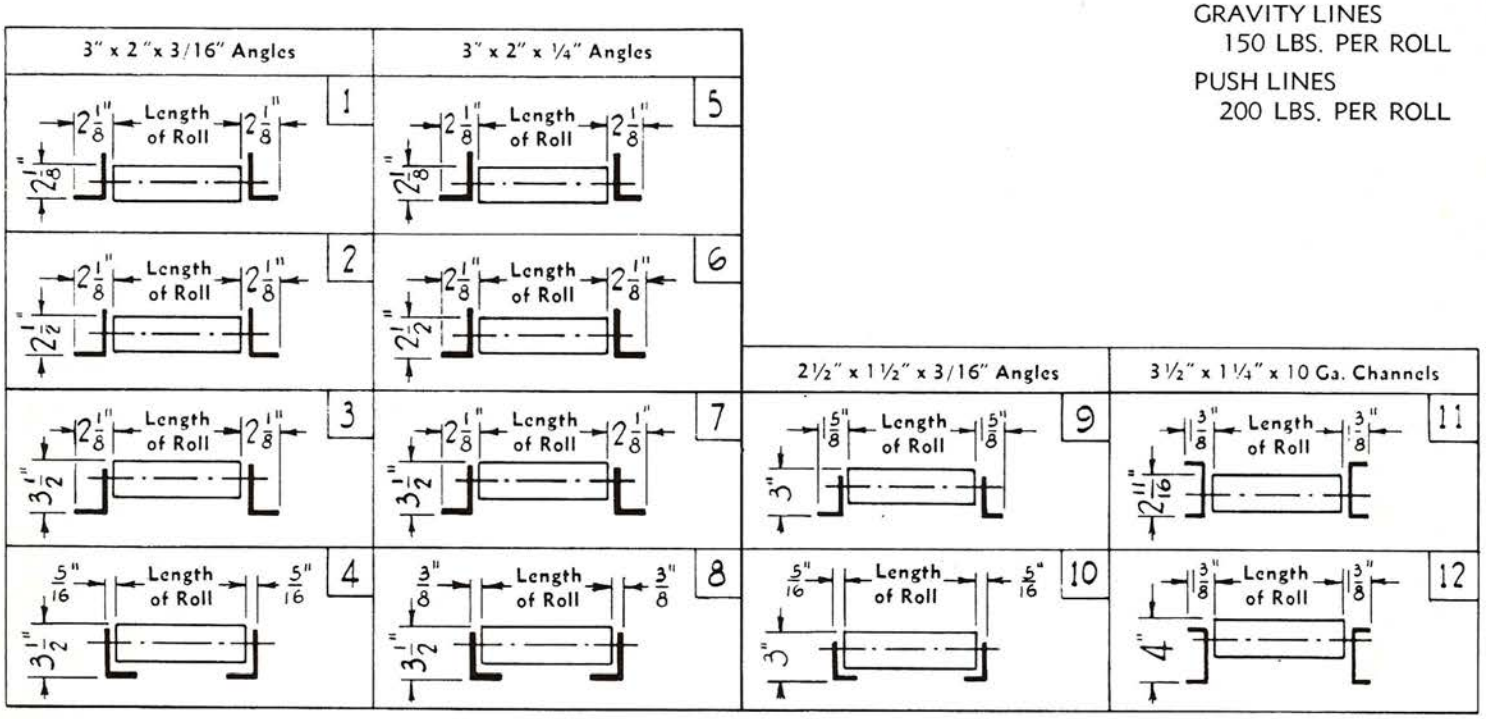
DUST-PROTECTED ROLL—(No. 5-D Roll) has the same No. 50-D bearing with outer Labyrinth Seal but without lubricating duct or Floating Seal in rear of bearing.

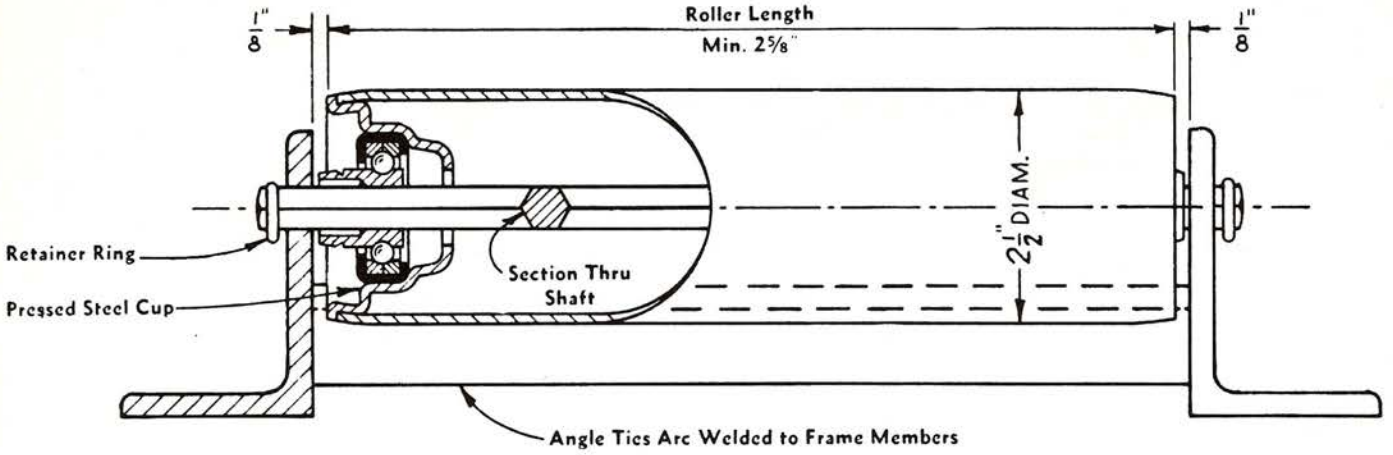
See Page 16.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL





ROLLER—2½" O.D. No. 14 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

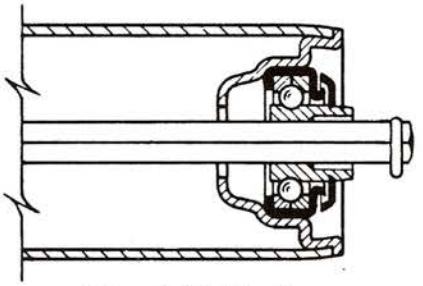
BEARING—No. 50. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.



No. 6-D Roll

DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

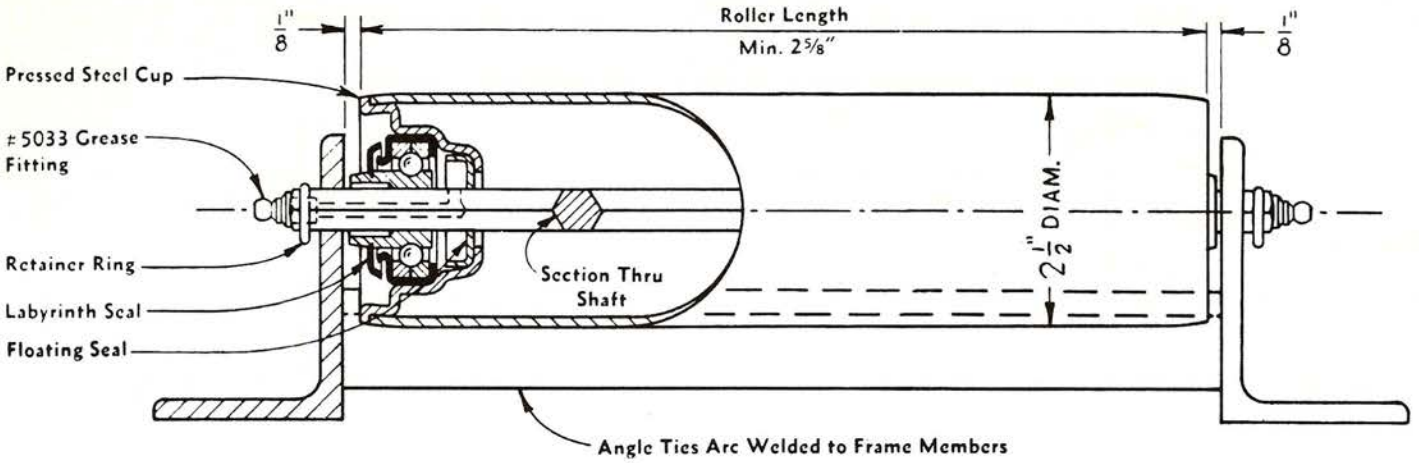
PRESSURE LUBRICATED ROLL—(No. 6-L Roll) See Page 19.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL

3" x 2" x 3/16" Angles	3" x 2" x ¼" Angles	3½" x 1¼" x 10 Ga. Channels	4"-5.4# Channels
1	5		
2	6		
3	7	9	11
4	8	10	12



ROLLER—2 ½" O.D. No. 14 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50-D. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

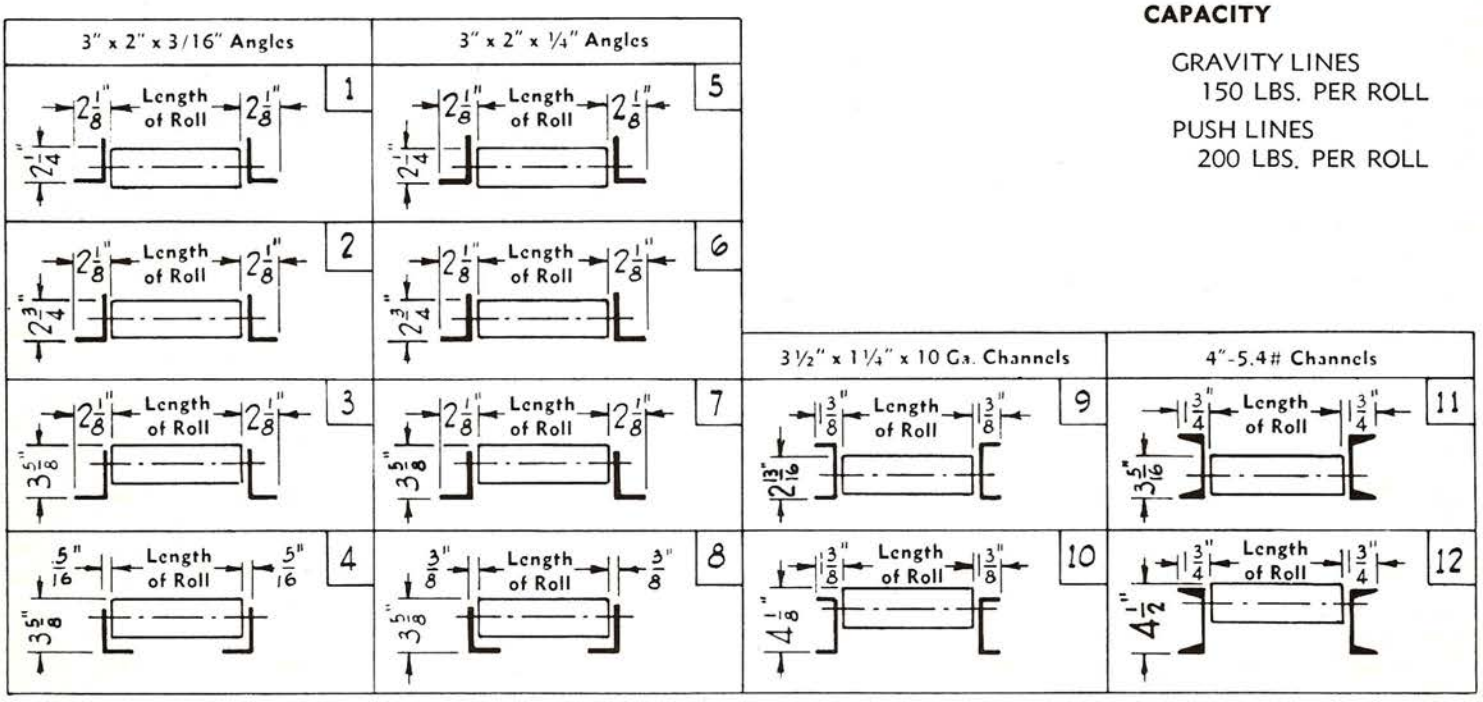
Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

DUST-PROTECTED ROLL—(No. 6-D Roll) has the same No. 50-D bearing with outer Labyrinth Seal but without lubricating duct or Floating Seal in rear of bearing.

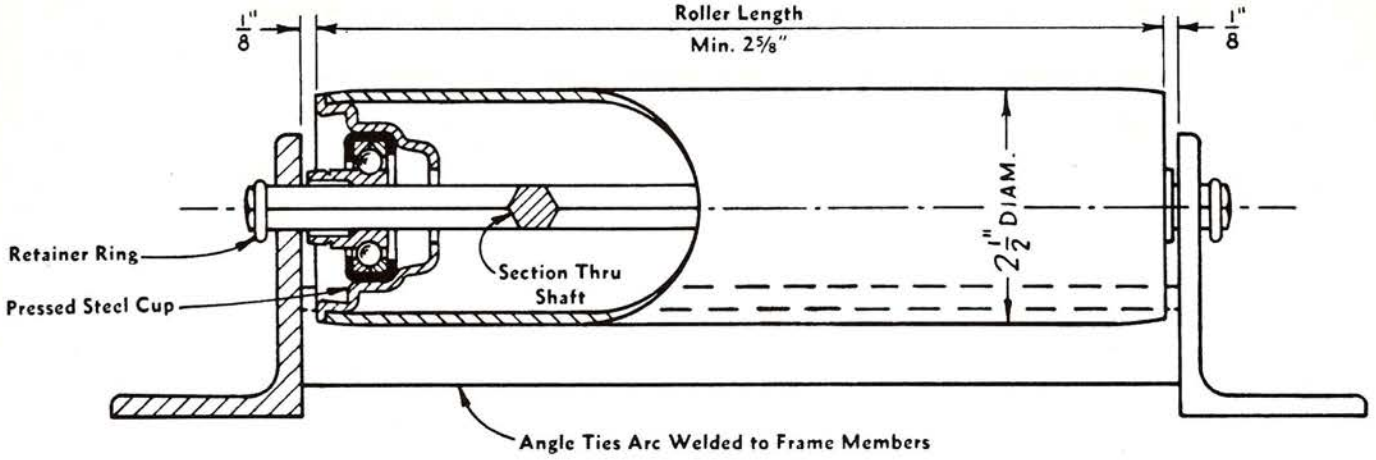
See Page 18.



CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL



ROLLER—2½" O.D. No. 10 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

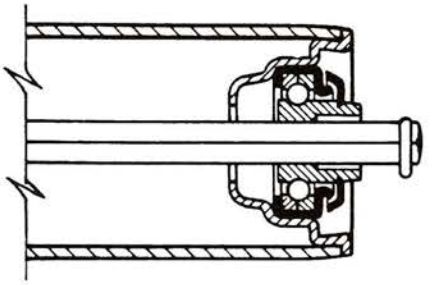
BEARING—No. 50. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.



No. 8-D Roll

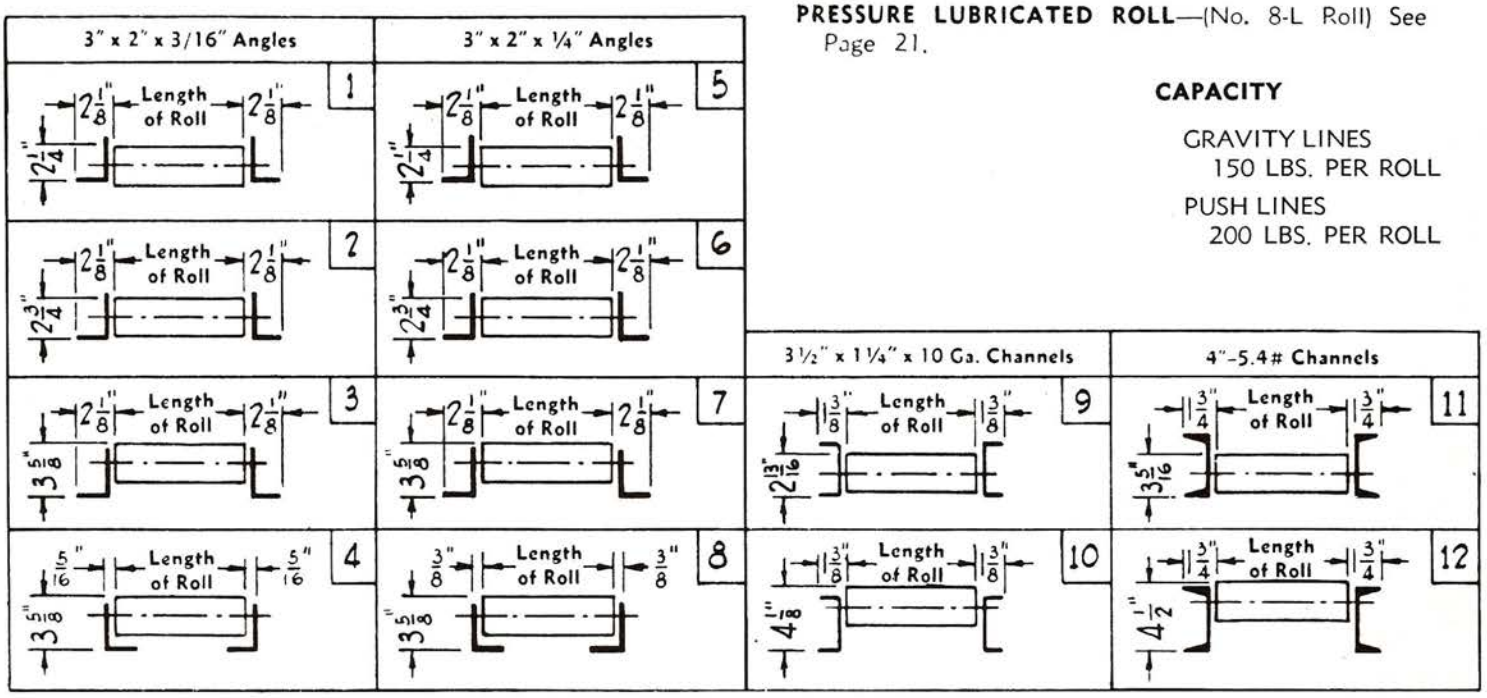
DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

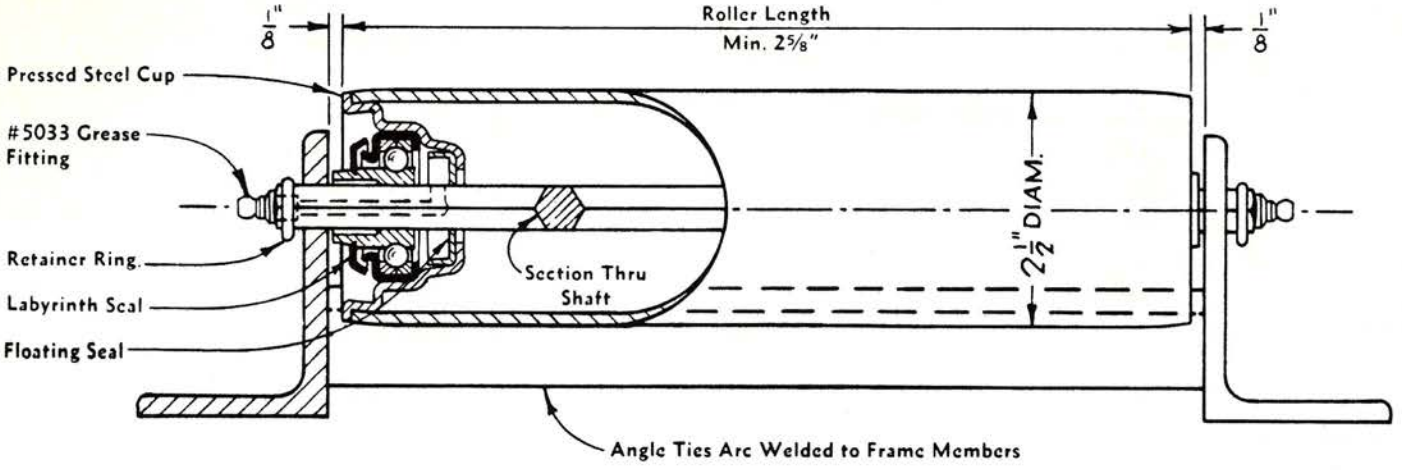
PRESSURE LUBRICATED ROLL—(No. 8-L Roll) See Page 21.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL





ROLLER—2½" O.D. No. 10 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50-D. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

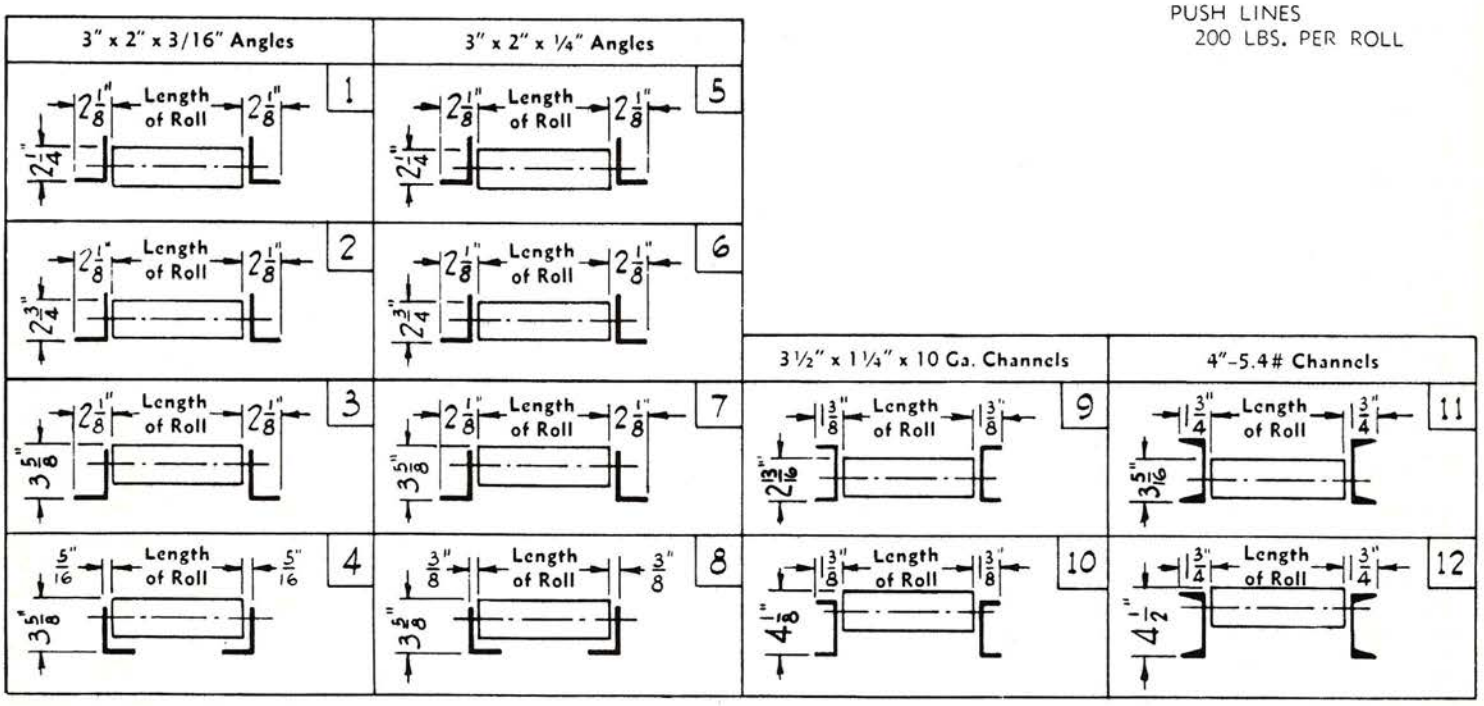
GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

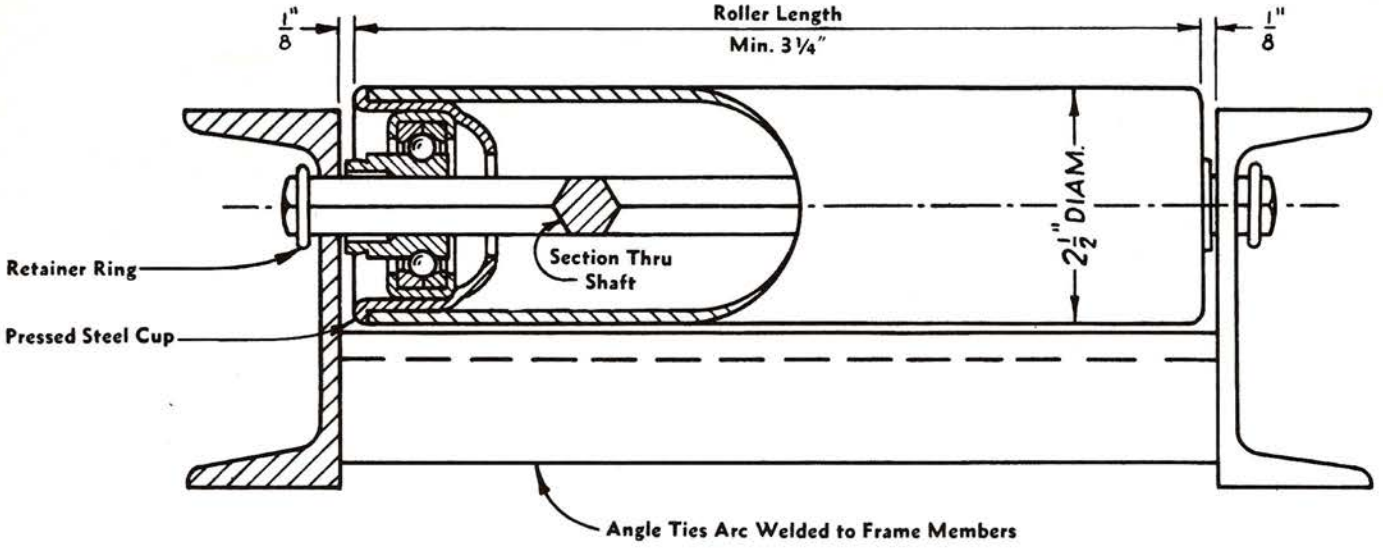
DUST-PROTECTED ROLL—(No. 8-D Roll) has the same No. 50-D bearing with outer Labyrinth Seal but without lubricating duct or Floating Seal in rear of bearing. See Page 20.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL





ROLLER—2½" O.D. No. 10 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—⅝" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

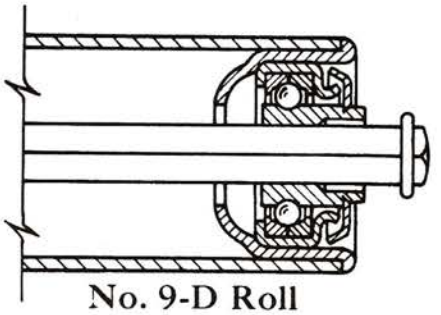
BEARING—No. 55. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–5/16" Hardened Steel Balls.

Pressed Steel Outer Casing.



No. 9-D Roll

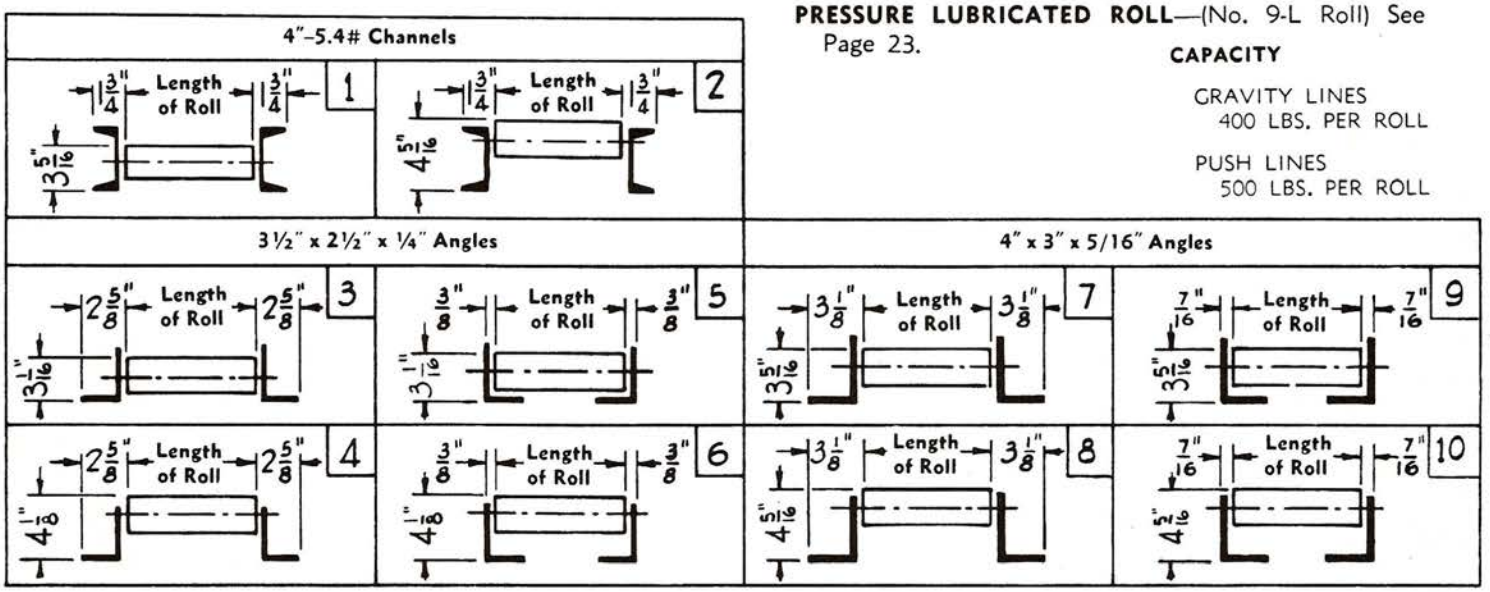
DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

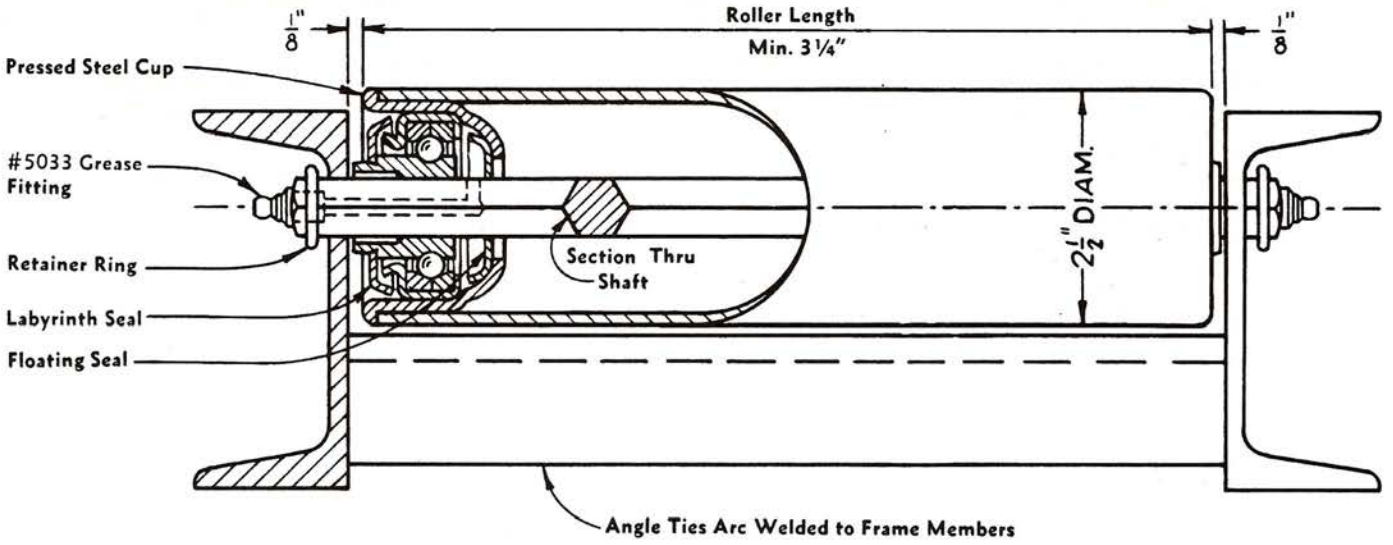
PRESSURE LUBRICATED ROLL—(No. 9-L Roll) See Page 23.

CAPACITY

GRAVITY LINES
400 LBS. PER ROLL

PUSH LINES
500 LBS. PER ROLL





ROLLER—2½" O.D. No. 10 Ga. Welded Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—⅝" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 55-D. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–5/16" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

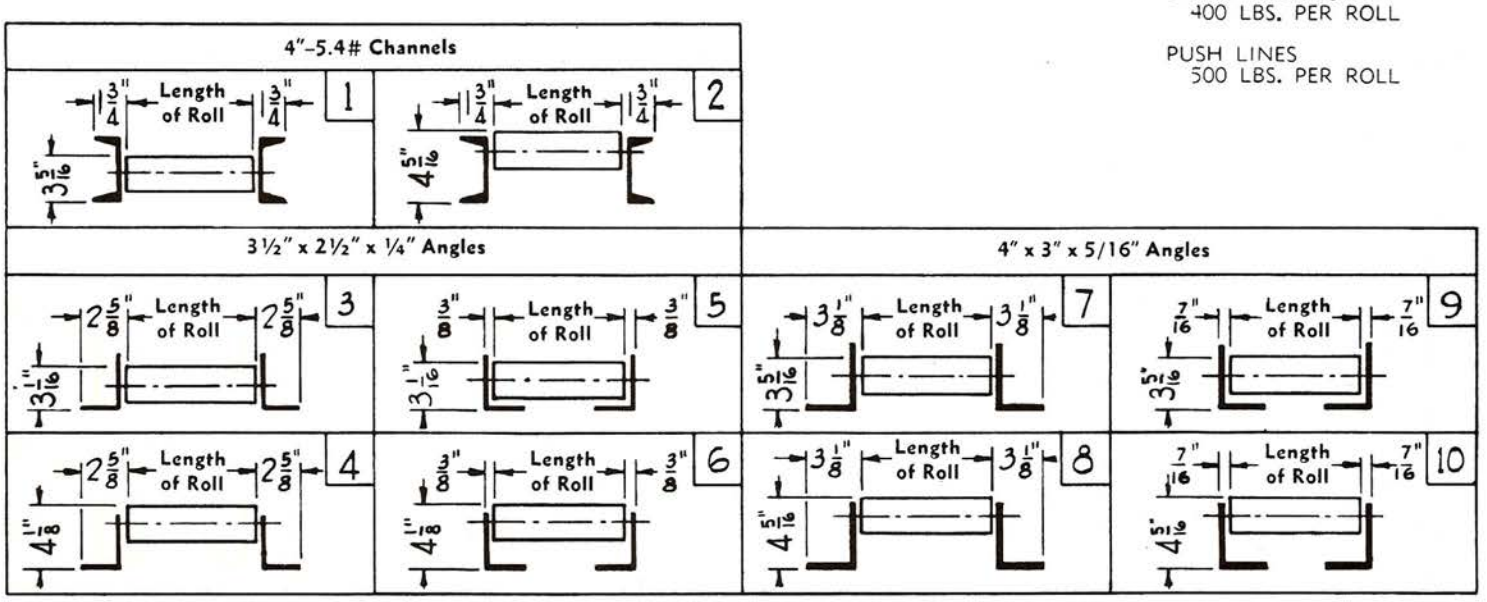
DUST-PROTECTED ROLL—(No. 9-D Roll) has the same No. 55-D bearing with outer Labyrinth Seal but without lubricating duct or Floating Seal in rear of bearing.

See Page 22.

CAPACITY

GRAVITY LINES
400 LBS. PER ROLL

PUSH LINES
500 LBS. PER ROLL



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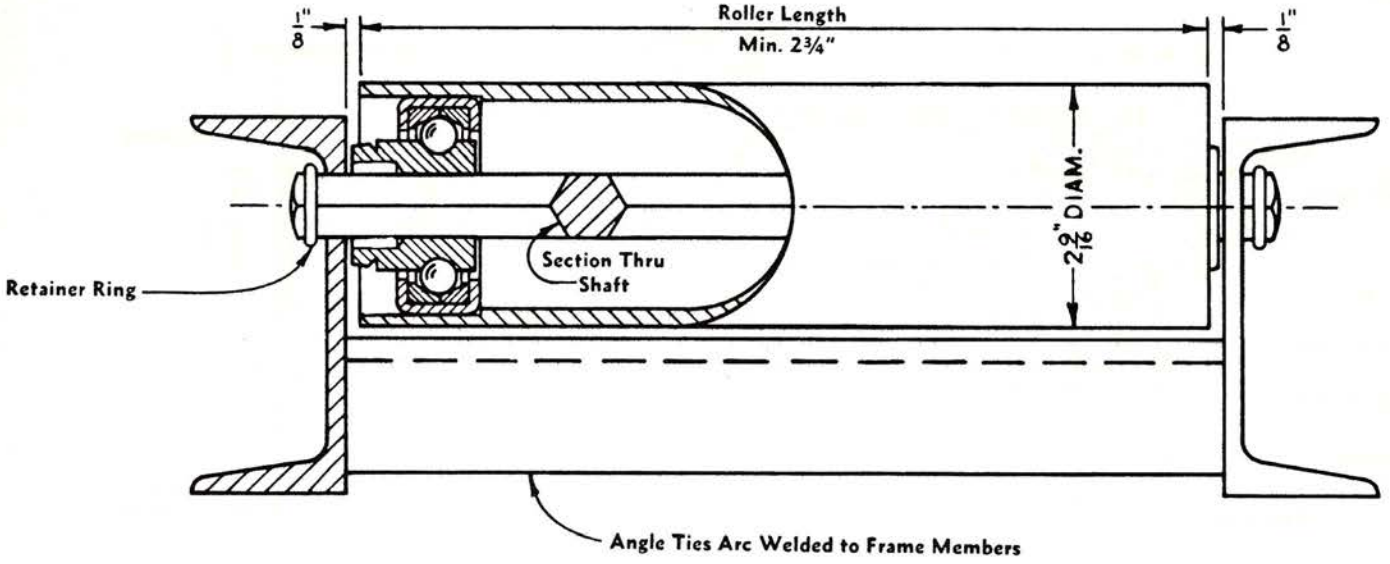
No. 9-L Roll



ROLLER—2-9/16" O.D. No. 7 Ga. Steel Tubing. Reamed to receive bearing.

SHAFT—11/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

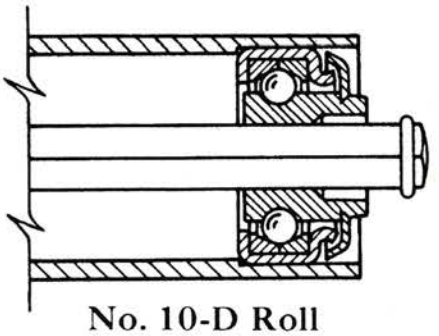
BEARING—No. 60. Slip fit in tubing, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–3/8" Hardened Steel Balls.

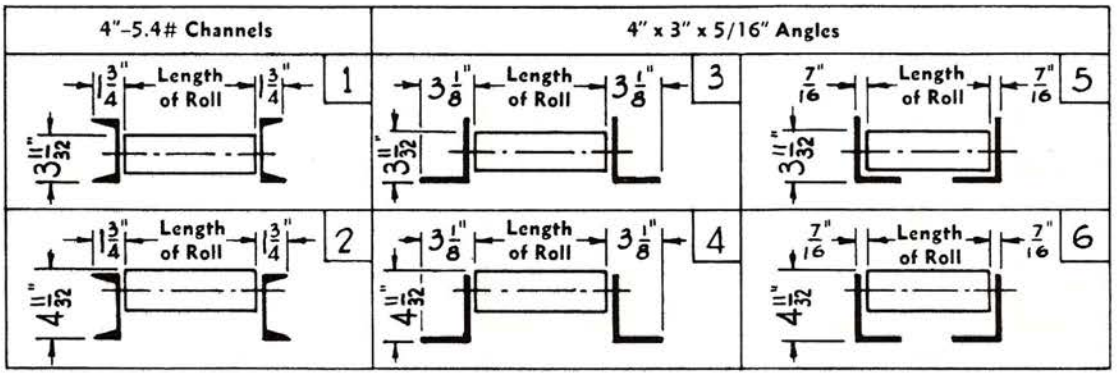
Pressed Steel Outer Casing.



No. 10-D Roll

DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

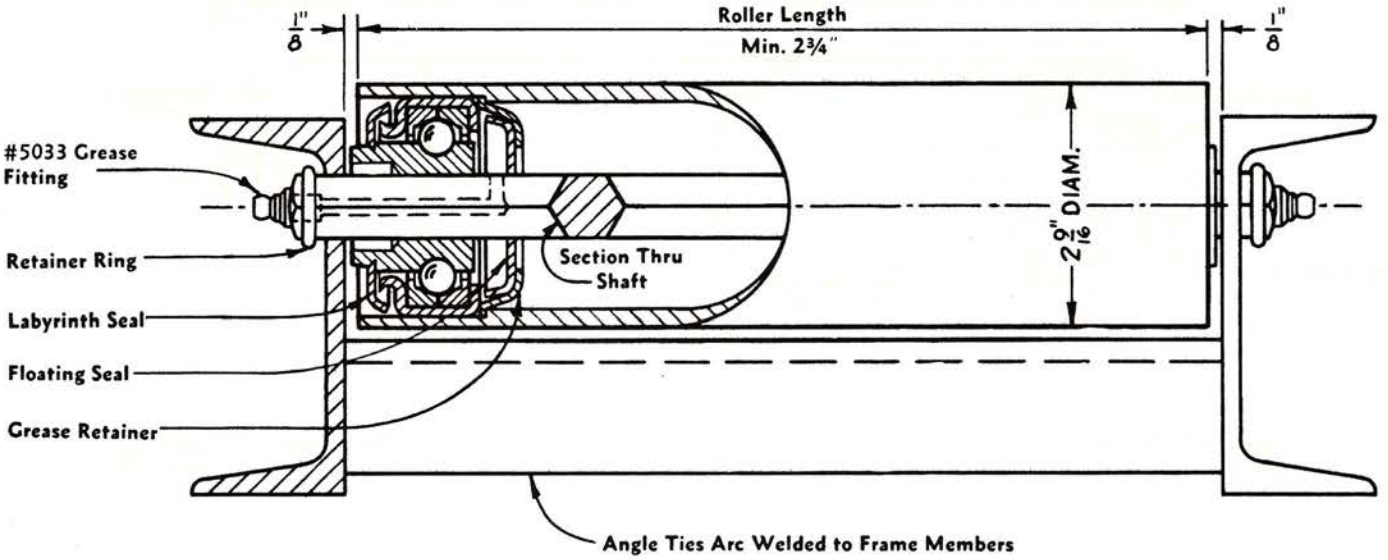
PRESSURE LUBRICATED ROLL—(No. 10-L Roll) See Page 25.



CAPACITY

GRAVITY LINES
600 LBS. PER ROLL

PUSH LINES
750 LBS. PER ROLL



ROLLER—2-9/16" O.D. No. 7 Ga. Steel Tubing. Reamed to receive bearing.

SHAFT—11/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 60-D. Slip fit in tubing, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

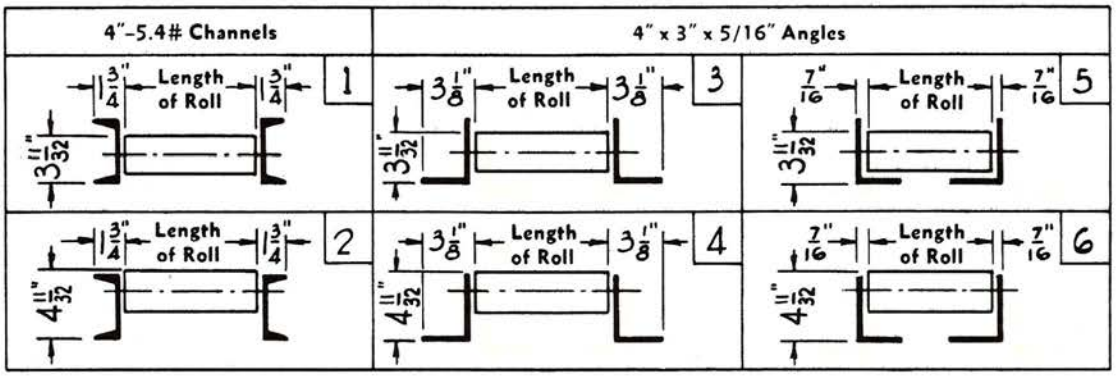
12–⅜" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

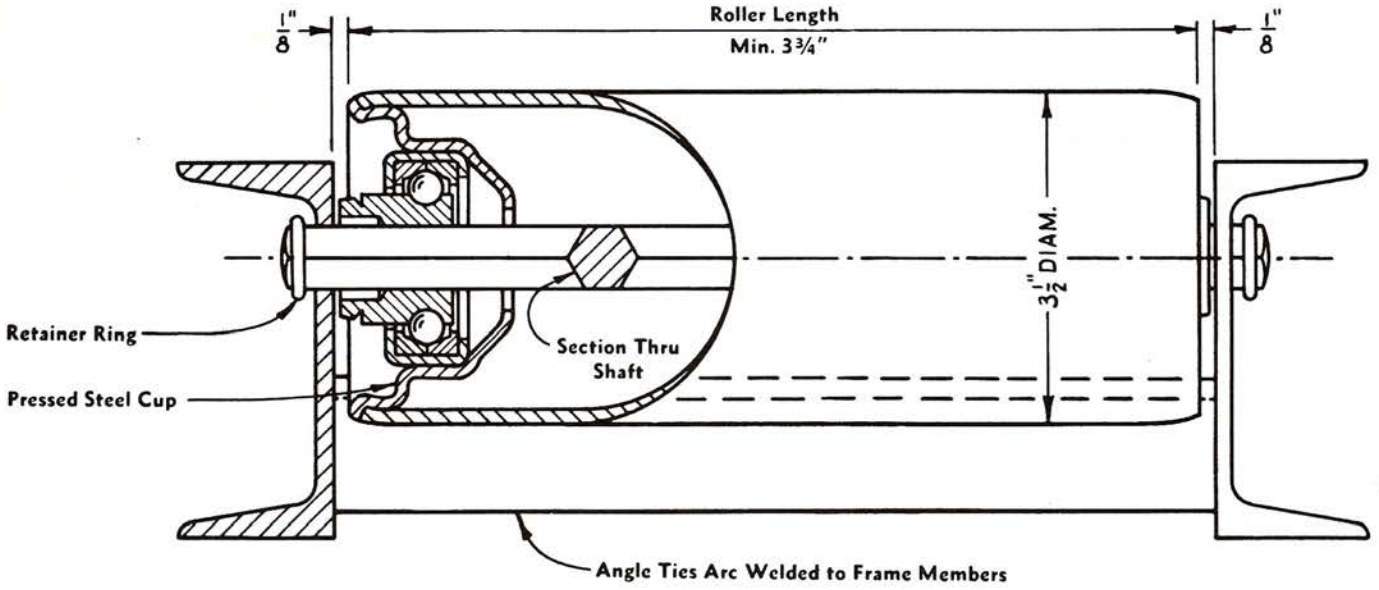
DUST-PROTECTED ROLL—(No. 10-D Roll) has the same No. 60-D bearing with outer Labyrinth Seal but without lubricating duct or cups in rear of bearing. See Page 24.



CAPACITY

GRAVITY LINES
600 LBS. PER ROLL

PUSH LINES
750 LBS. PER ROLL



ROLLER—3½ O.D. No. 9 Ga. Steel Tubing. Pressed steel cup secured to tubing.

SHAFT—11/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

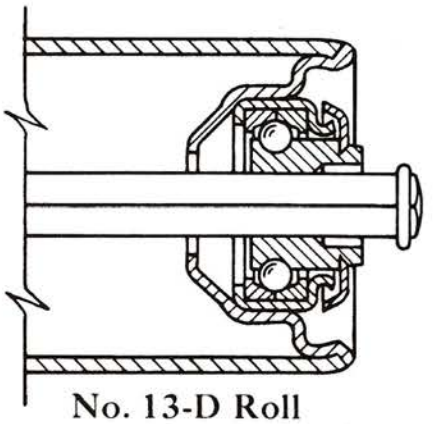
BEARING—No. 60. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–⅜" Hardened Steel Balls.

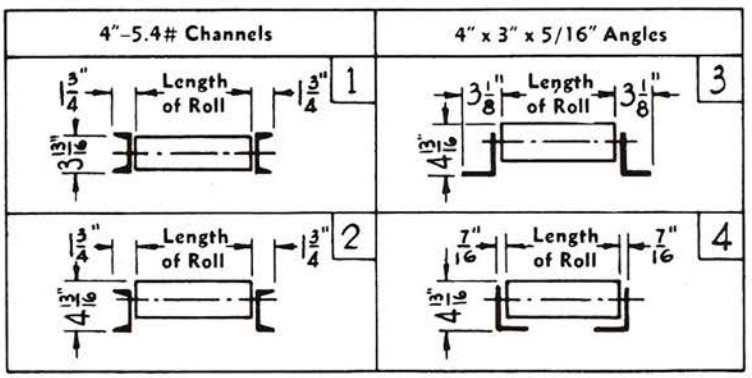
Pressed Steel Outer Casing.



No. 13-D Roll

DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

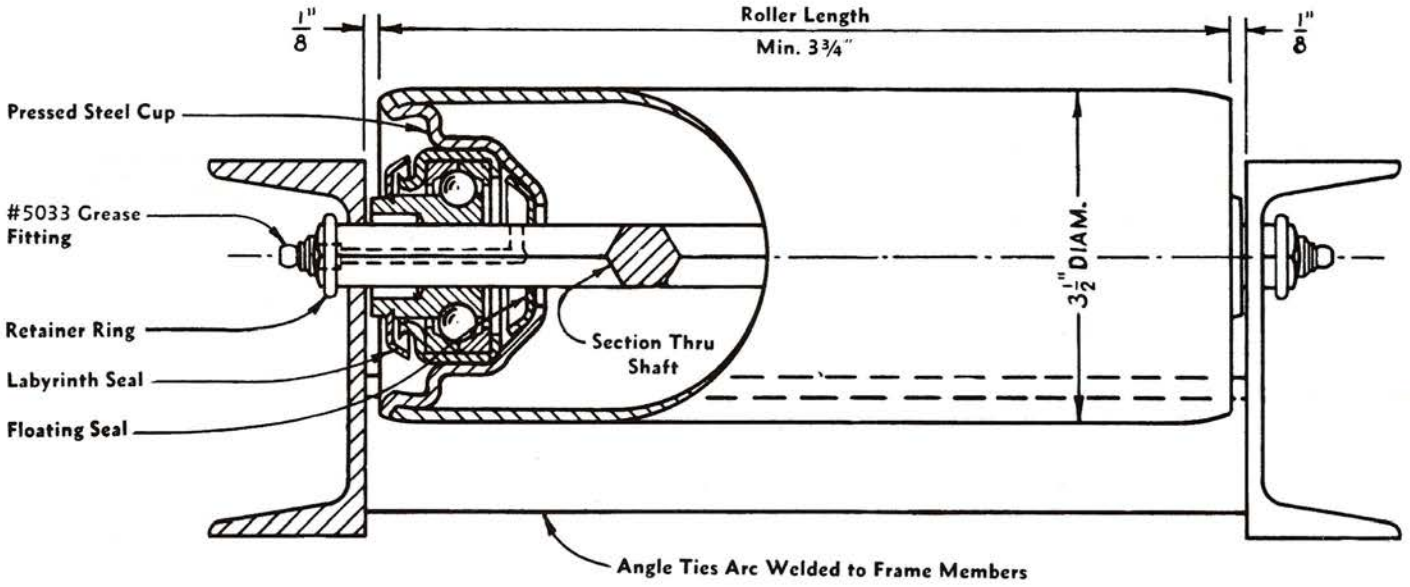
PRESSURE LUBRICATED ROLL—(No. 13-L Roll) See Page 27.



CAPACITY

GRAVITY LINES
600 LBS. PER ROLL

PUSH LINES
750 LBS. PER ROLL



ROLLER—3½ O.D. No. 9 Ga. Steel Tubing Pressed steel cup secured to tubing.

SHAFT—11/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 60-D. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–⅜" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

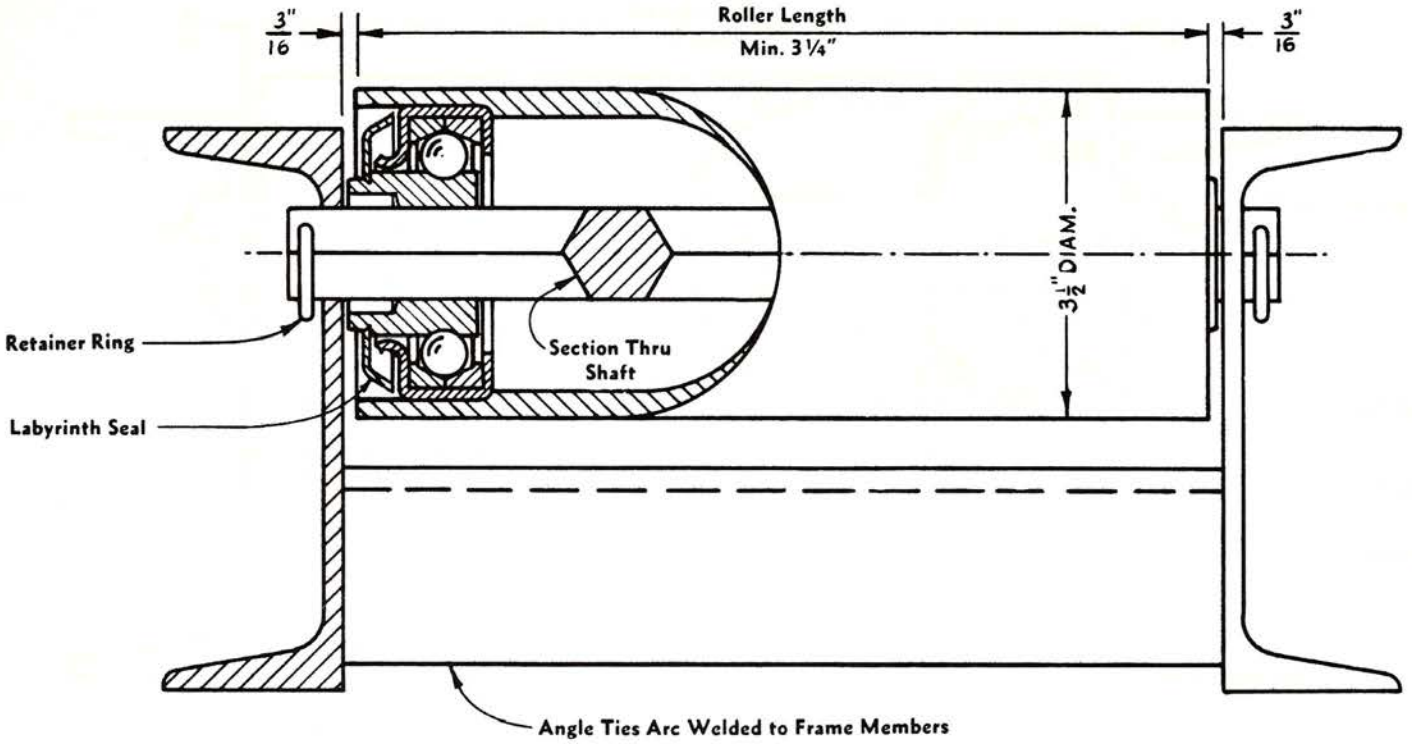
DUST-PROTECTED ROLL—(No. 13-D Roll) has the same No. 60-D bearing with outer Labyrinth Seal but without lubricating duct or Floating Seal in rear of bearing. See Page 26.

4"–5.4# Channels	4" x 3" x 5/16" Angles
1	3
2	4

CAPACITY

GRAVITY LINES
600 LBS. PER ROLL

PUSH LINES
750 LBS. PER ROLL



ROLLER—3½" O.D. 5/16" Wall Seamless Steel Tubing. Reamed to receive bearing.

SHAFT—1" Hexagon Cold Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 70-D. Slip fit in tubing, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

13–½" Hardened Steel Balls.

Pressed Steel Outer Casing.

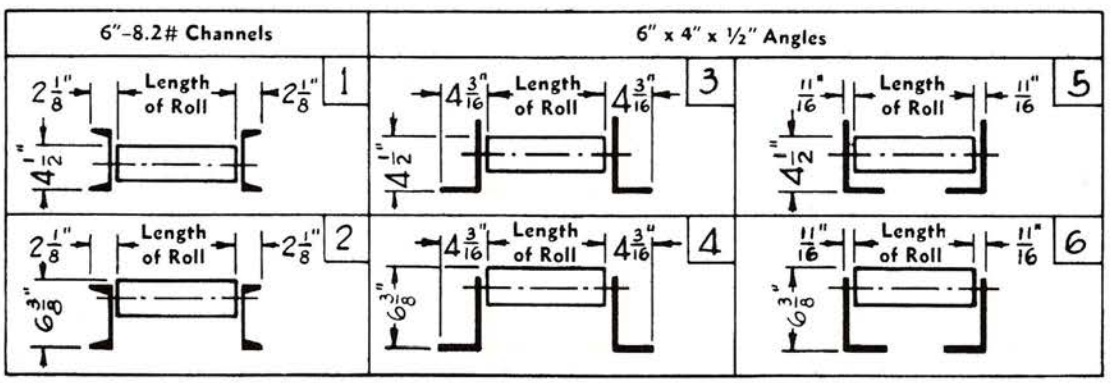
DUST-PROTECTED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Particles entering past outer seal are caught in inner curved portion and ejected at bottom as roll revolves.

PRESSURE LUBRICATED ROLL—(No. 15-L Roll) See Page 29.

CAPACITY

GRAVITY LINES
2000 LBS. PER ROLL

PUSH LINES
2500 LBS. PER ROLL



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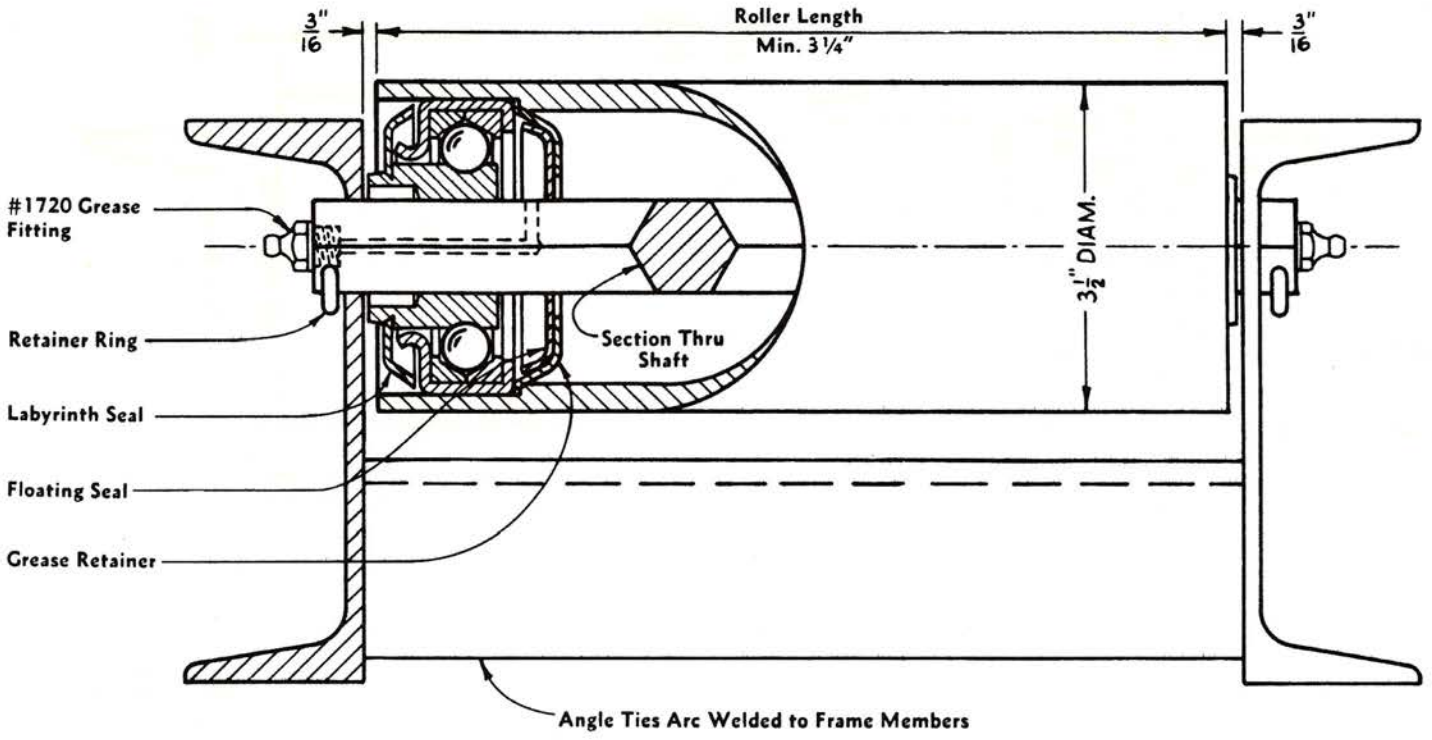
No. 15-D Roll



ROLLER—3½" O.D. 5/16" Wall Seamless Steel Tubing. Reamed to receive bearing.

SHAFT—1" Hexagon Cold Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 70-D. Slip fit in tubing, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

13–½" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

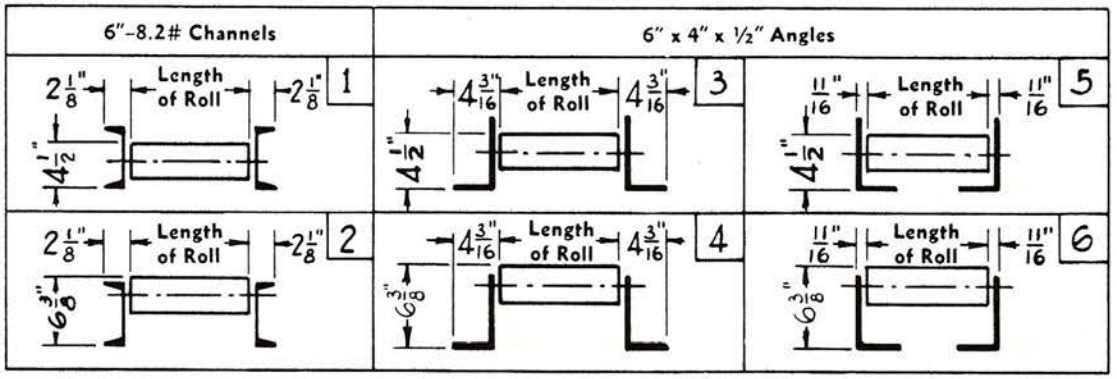
GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

DUST-PROTECTED ROLL—(No. 15-D Roll) has the same No. 70-D bearing with outer Labyrinth Seal but without lubricating duct or cups in rear of bearing. See Page 28.

CAPACITY

GRAVITY LINES
2000 LBS. PER ROLL

PUSH LINES
2500 LBS. PER ROLL



Logan Co.
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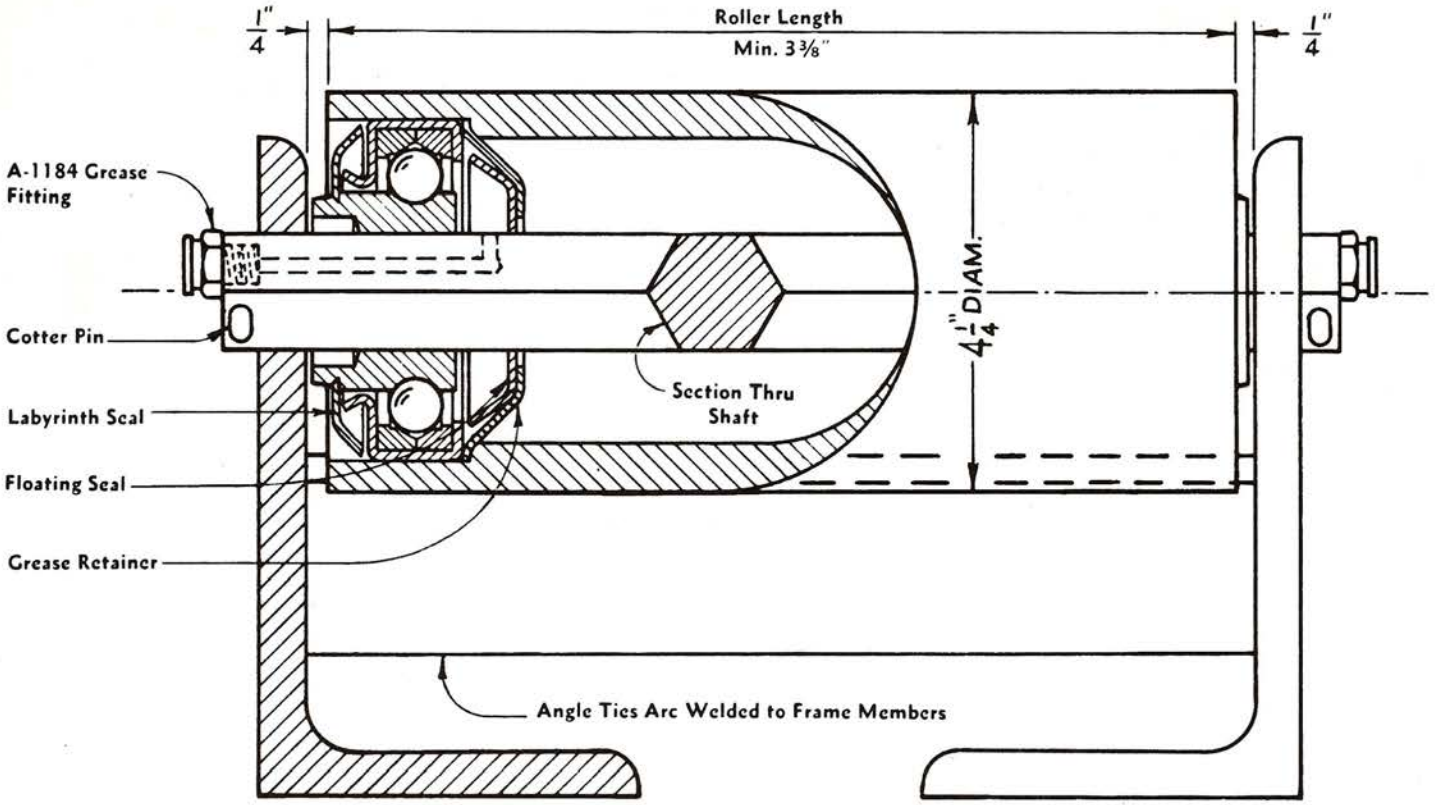
No. 15-L Roll



ROLLER—4¼" O.D. ½" Wall Seamless Steel Tubing. Reamed to receive bearing.

SHAFT—1¼" Hexagon Cold Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 75-D. Slip fit in tubing, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

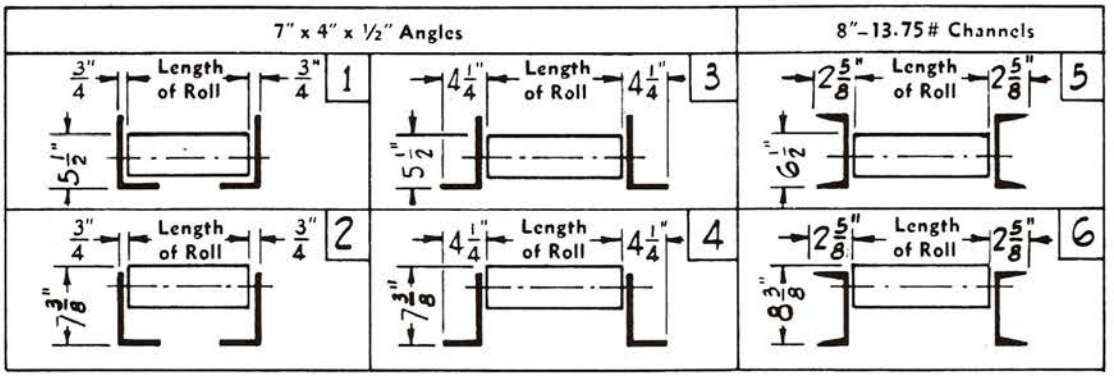
13–9/16" Hardened Steel Balls.

Pressed Steel Outer Casing.

PRESSURE LUBRICATED ROLL—All-steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

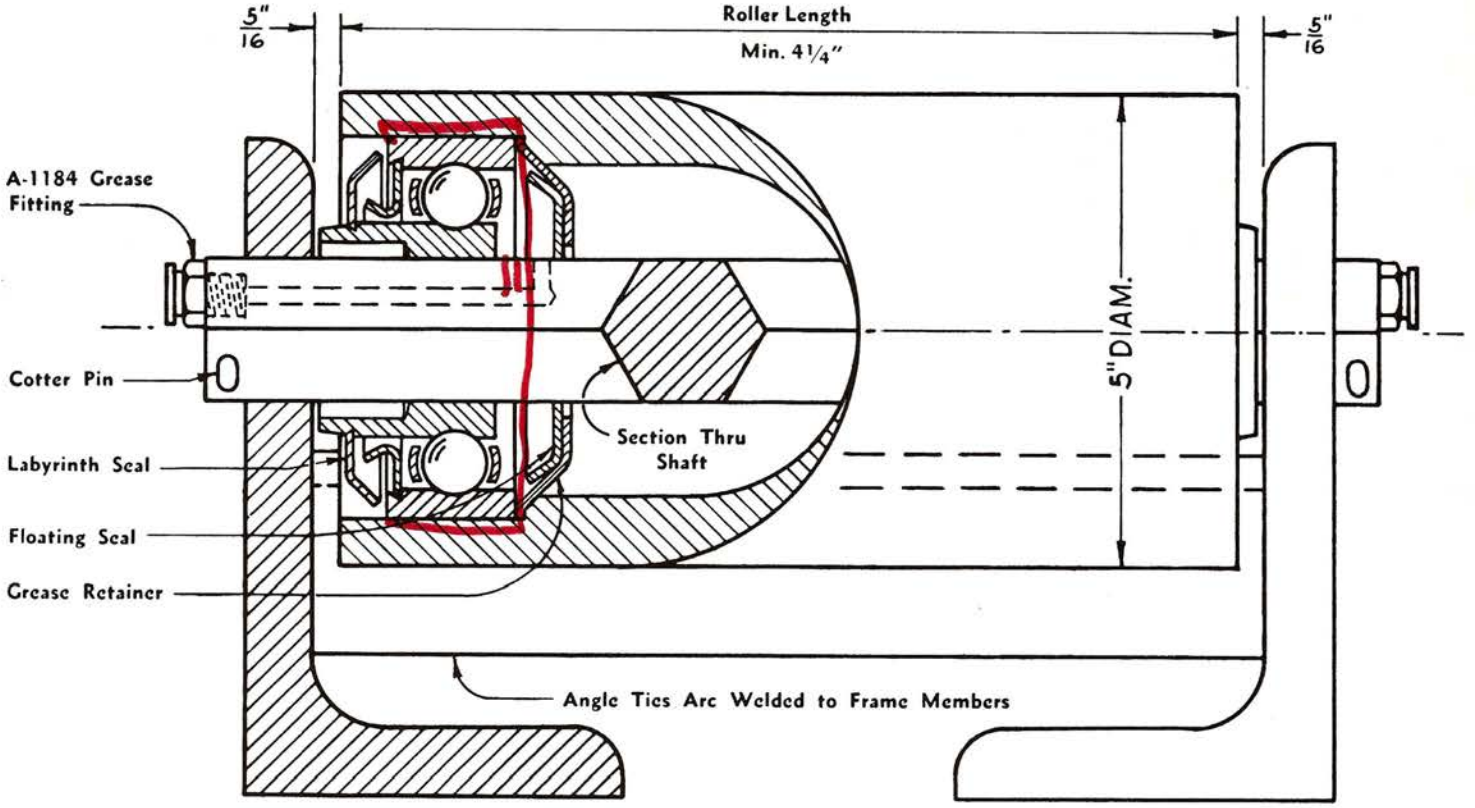
DUST-PROTECTED ROLL—(No. 75-D Roll) has the same No. 75-D bearing with outer Labyrinth Seal but without lubricating duct or cups in rear of bearing.



CAPACITY

GRAVITY LINES
3,600 LBS. PER ROLL

PUSH LINES
4,500 LBS. PER ROLL



ROLLER—5" O.D. .710" Wall Seamless Steel Tubing .40 Carbon. Reamed to receive bearing.

SHAFT—1 1/2" Hexagon Cold Rolled Thru Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 85-D Semi-Precision Type. Light press fit in tubing, easily removed and replaced. Protected position set back from end of roll.

One piece outer and inner races turned from special alloy steel, heat treated, hardened and tempered.

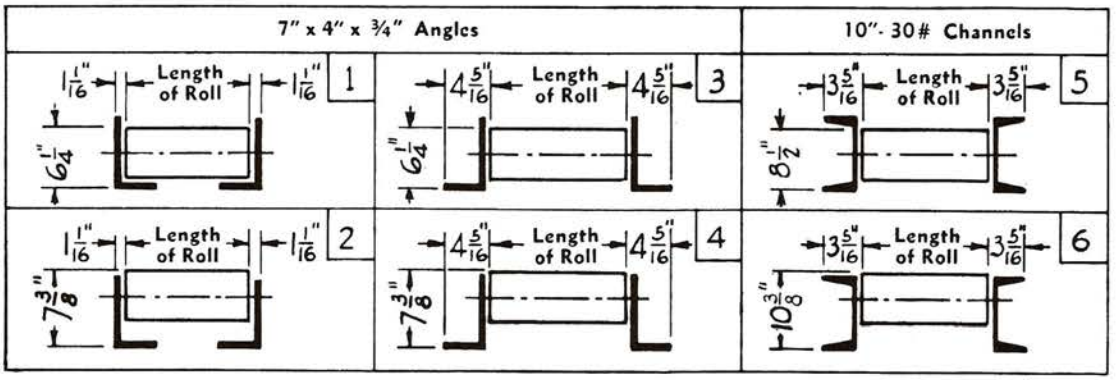
Inner race broached to slip fit on hexagon shaft, positively locking inner race against rotation.

8–11/16" Chrome Alloy Balls, held in ball separator.

PRESSURE LUBRICATED ROLL—All steel seals allow minimum friction loss. Outer Labyrinth Seal is integral part of bearing. Floating Seal (Pat'd) is slip fit on shaft and seals inner end of grease chamber.

GREASE PACKED ROLL—Same as above except grease fitting and duct omitted. Bearing packed with grease at factory.

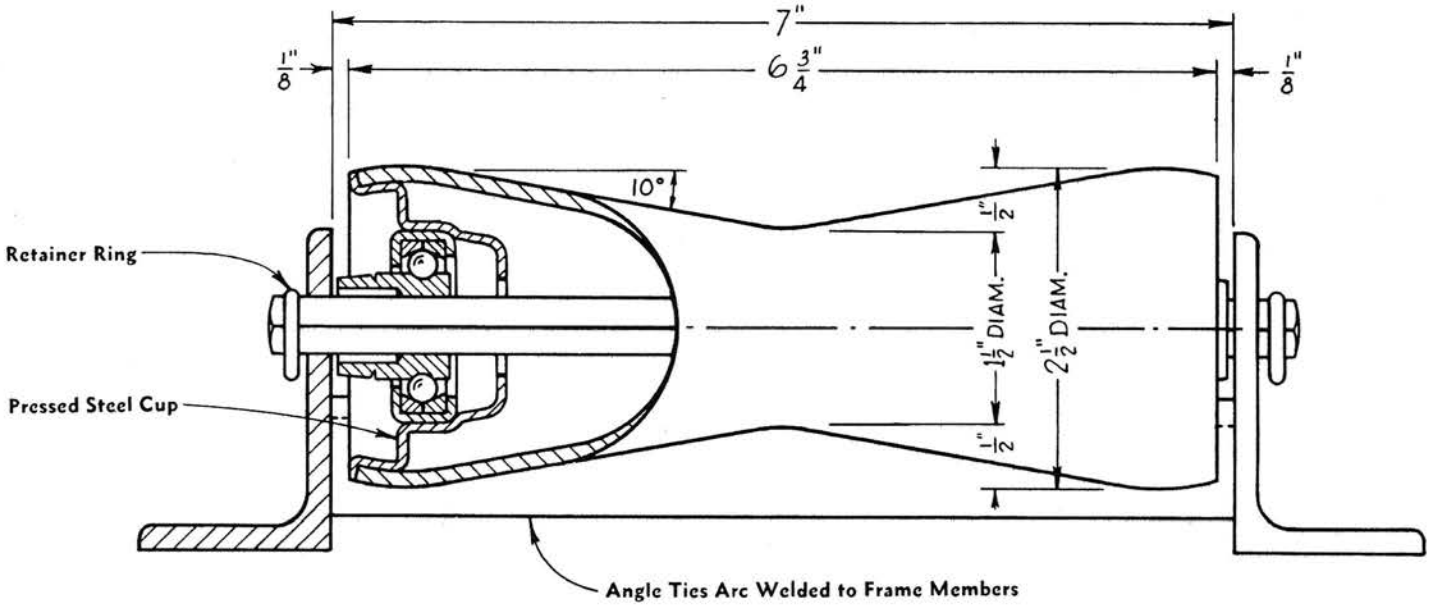
DUST PROTECTED ROLL—(No. 85-D Roll) has the same No. 85-D bearing with outer Labyrinth Seal but without lubricating duct or cups in rear of bearing.



CAPACITY

GRAVITY LINES
6,000 LBS. PER ROLL

PUSH LINES
7,500 LBS. PER ROLL



ROLLER—No. 10 Ga. Welded Steel Tubing die formed. Pressed steel cup secured to tubing.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–1/4" Hardened Steel Balls.

Pressed Steel Outer Casing.

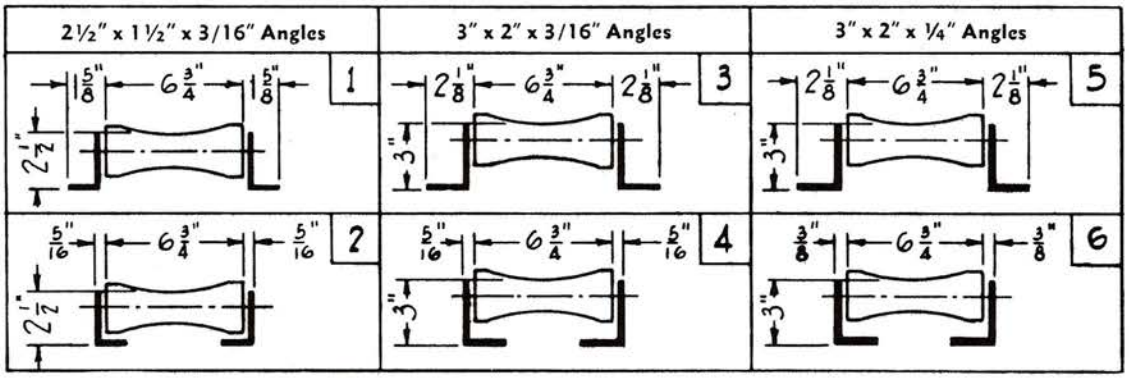
GENERAL—The Style A Concave Roll is also available in Dust Protected, Grease Packed, and Pressure Lubricated constructions. See Page 20 and 21.

Can be furnished with 3/16" thick Neoplastic covering

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL

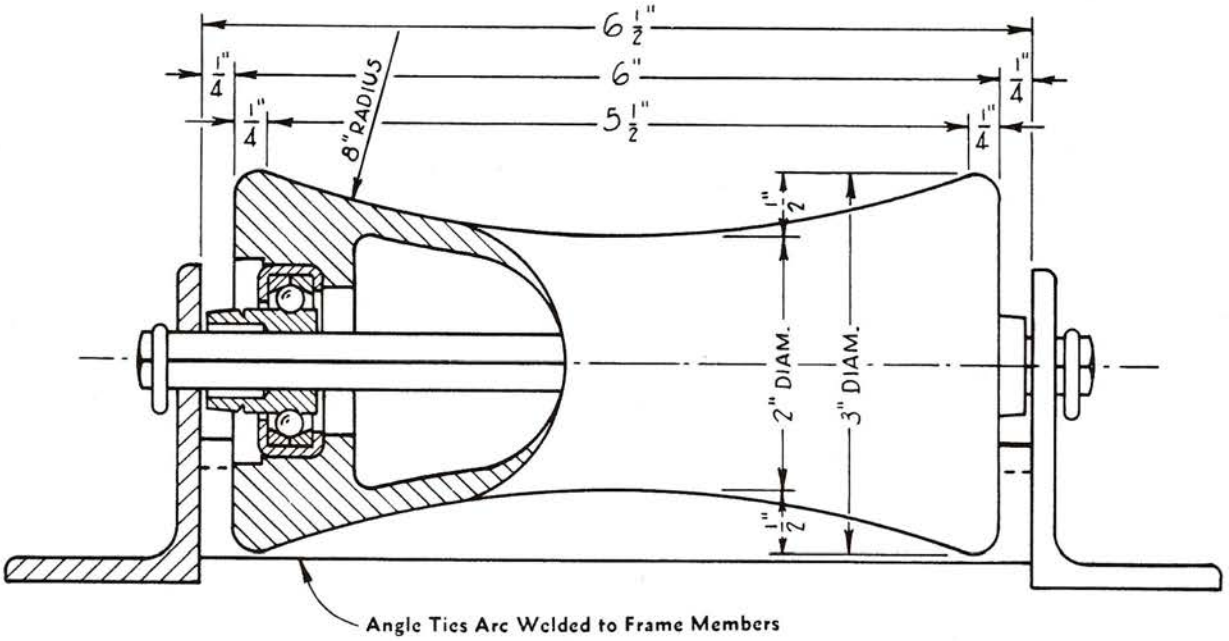


ALTERNATE
No. 55 Bearing and 5/8" Hexagon Shaft.
See Page 22.

CAPACITY
GRAVITY LINES
400 LBS. PER ROLL
PUSH LINES
500 LBS. PER ROLL

Logan Co.
LOUISVILLE, KENTUCKY 40206

Concave Roll—Style A



ROLLER—Grey Iron Casting with ends reamed to receive bearings.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50. Slip fit in end of roll, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.

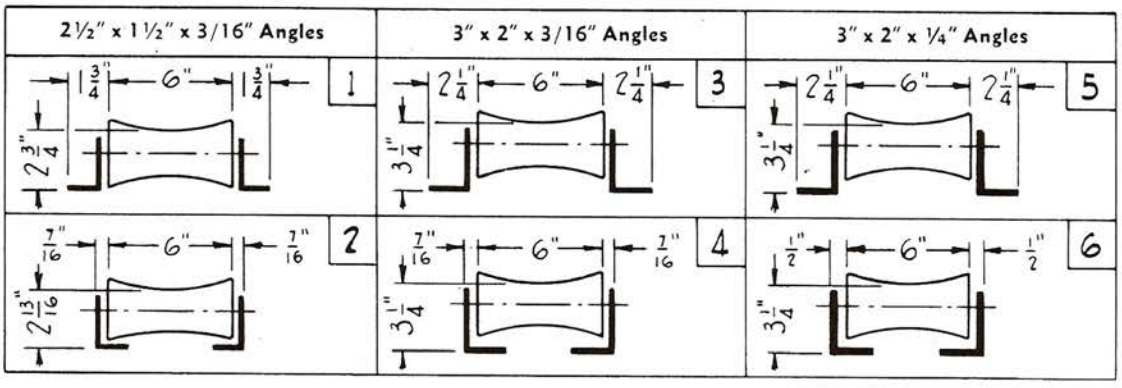
GENERAL—The Style B Concave Roll is also available in Dust Protected construction but not Grease Packed or Pressure Lubricated.

Can be furnished with 3/16" thick Neoplastic covering.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL

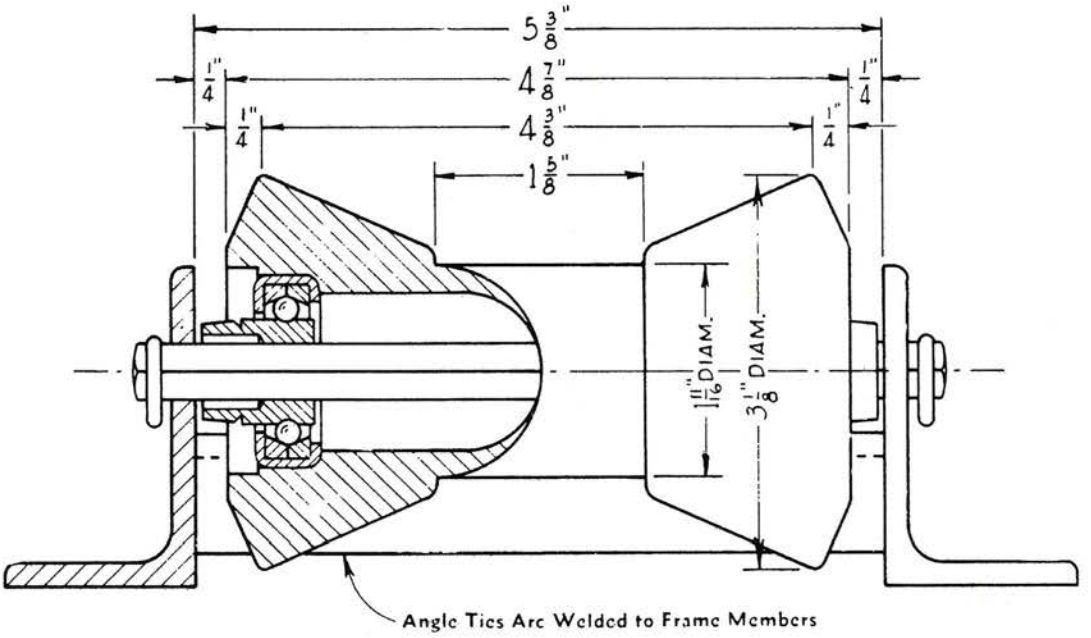


ALTERNATE
No. 55 Bearing and 5/8" Hexagon Shaft.
See Page 22.

CAPACITY
GRAVITY LINES
400 LBS. PER ROLL
PUSH LINES
500 LBS. PER ROLL

Logan Co.
LOUISVILLE, KENTUCKY 40206

Concave Roll—Style B



ROLLER—Grey Iron Casting with ends reamed to receive bearings.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50. Slip fit in end of roll, easily removed and replaced. Protected position — set back from end of roll.

Inner race and outer race rings, heat treated, hardened and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12—1/4" Hardened Steel Balls.

Pressed Steel Outer Casing.

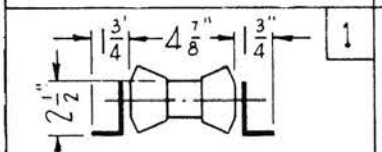
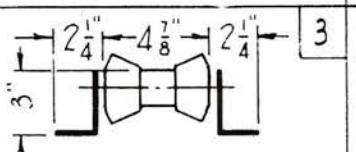
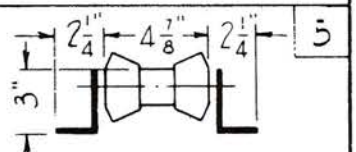
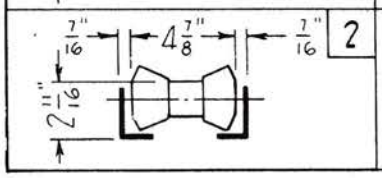
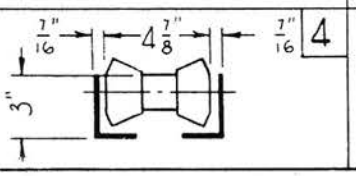
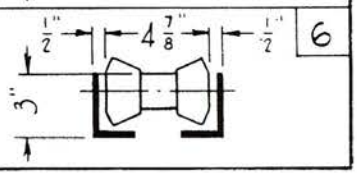
GENERAL—The Style H Concave Roll is also available in Dust Protected Construction but not Grease Packed or Pressure Lubricated.

Can be furnished with 3/16" thick Neoplastic covering.

CAPACITY

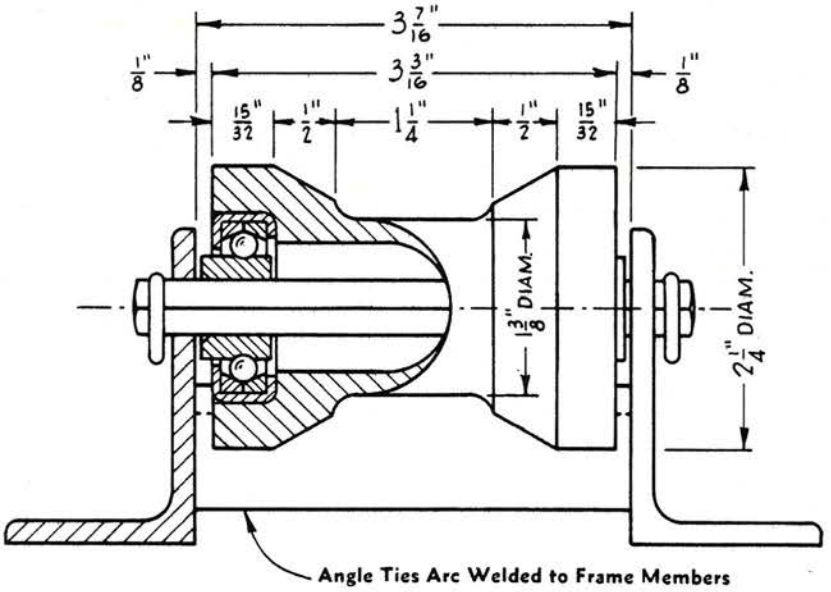
GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL

2½" x 1½" x 3/16" Angles	3" x 2" x 3/16" Angles	3" x 2" x ¼" Angles
 1	 3	 5
 2	 4	 6

ALTERNATE
No. 55 Bearing and 5/8" Hexagon Shaft.
See Page 22.

CAPACITY
GRAVITY LINES
400 LBS PER ROLL
PUSH LINES
500 LBS. PER ROLL



ROLLER—Grey Iron Casting with ends reamed to receive bearings.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50-S. Slip fit in end of roll, easily removed and replaced.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.

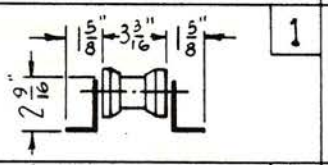
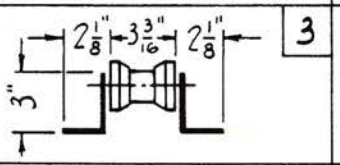
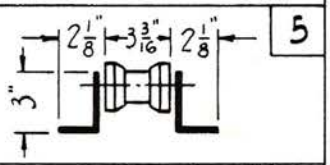
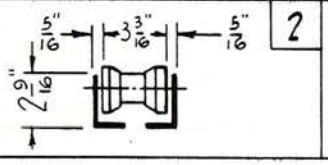
GENERAL—The Style D Concave Roll is available with plain bearings only.

Can be furnished with 3/16" thick Neoplastic covering.

CAPACITY

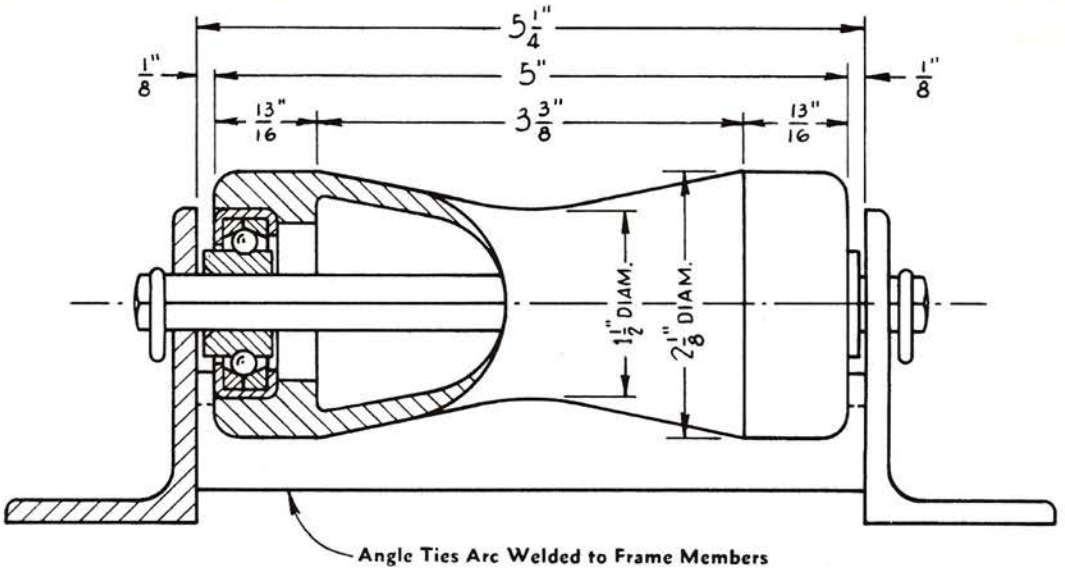
GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL

2½" x 1½" x 3/16" Angles	3" x 2" x 3/16" Angles	3" x 2" x ¼" Angles
 1	 3	 5
 2	4	6

Logan Co.
LOUISVILLE, KENTUCKY 40206

Concave Roll—Style D



ROLLER—Grey Iron Casting with ends reamed to receive bearings.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50-S. Slip fit in end of roll, easily removed and replaced.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

Pressed Steel Outer Casing.

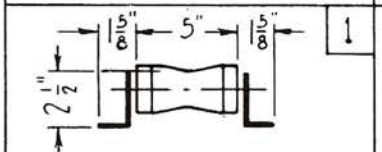
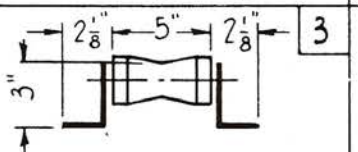
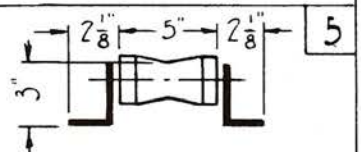
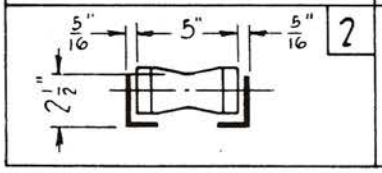
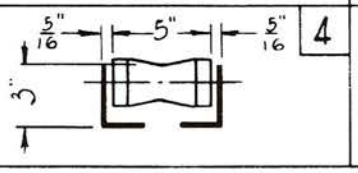
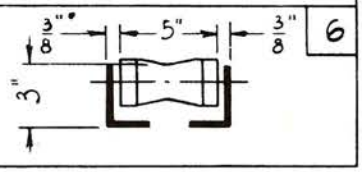
GENERAL—The Style F Concave Roll is available with plain bearings only.

Can be furnished with 3/16" thick Neoplastic covering

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

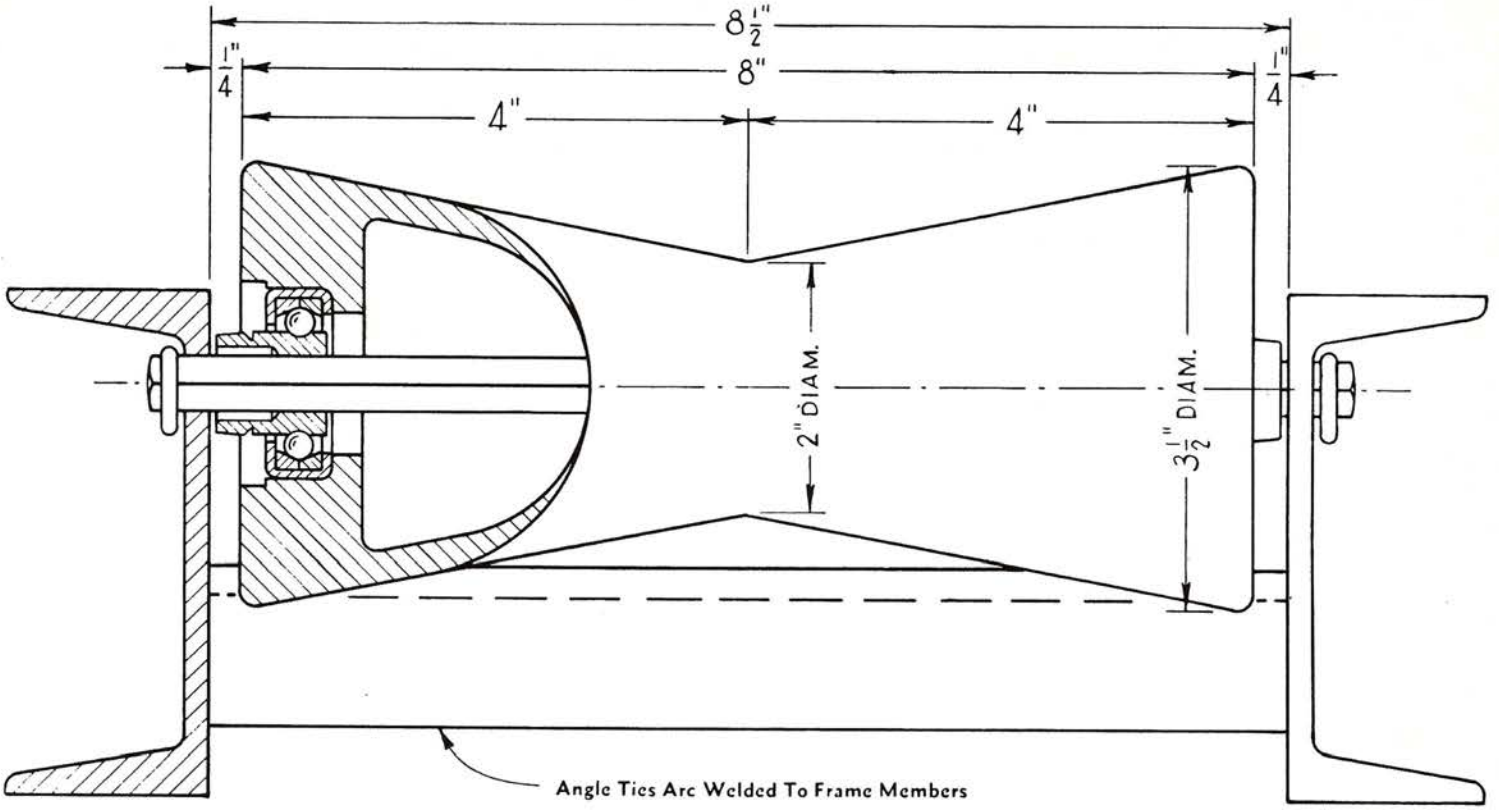
PUSH LINES
200 LBS. PER ROLL

2½" x 1½" x 3/16" Angles	3" x 2" x 3/16" Angles	3" x 2" x ¼" Angles
 1	 3	 5
 2	 4	 6

Logan Co.

LOUISVILLE, KENTUCKY 40206

Concave Roll—Style F



ROLLER—Grey Iron Casting with ends reamed to receive bearings.

SHAFT—7/16" Hexagon Rolled Steel. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50. Slip fit in end of roll, easily removed and replaced. Protected position—set back from end of roll.

Inner race and outer race rings heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–¼" Hardened Steel Balls.

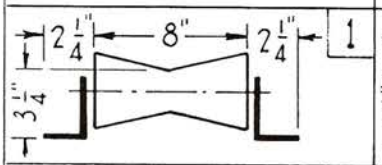
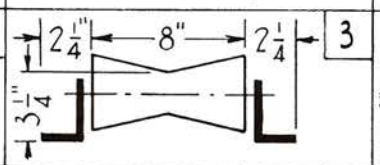
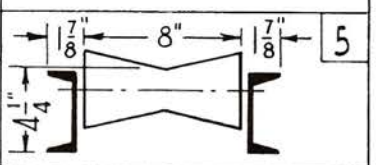
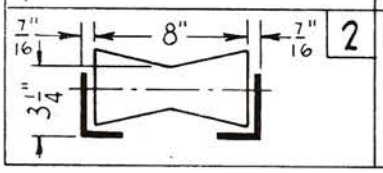
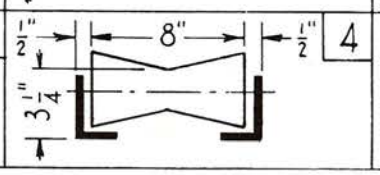
Pressed Steel Outer Casing.

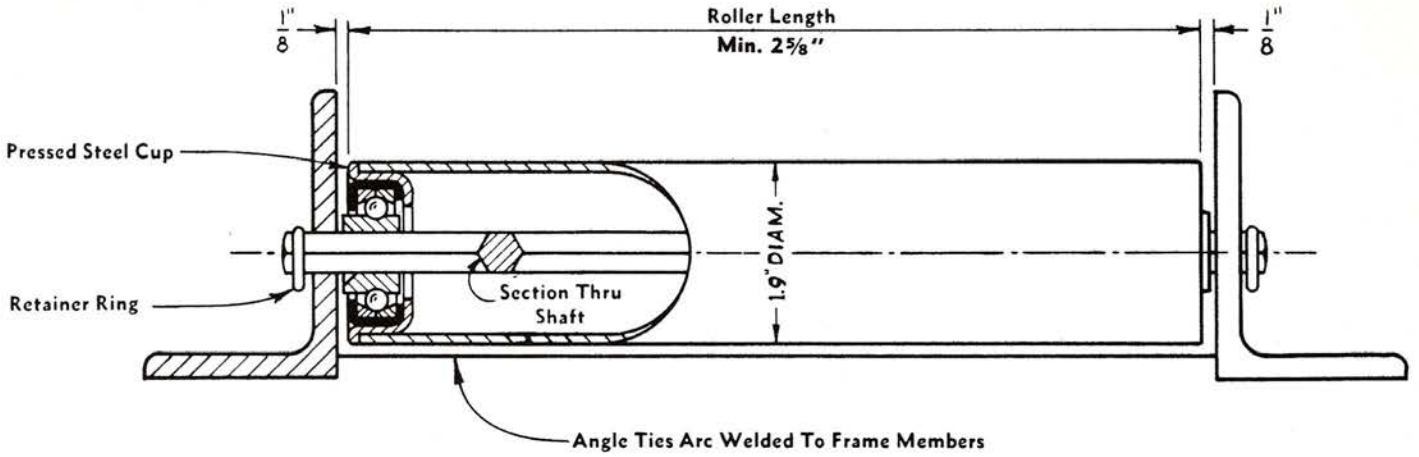
GENERAL—The Style H Concave Roll is also available in Dust Protected Construction but not Grease Packed or Pressure Lubricated.

CAPACITY

GRAVITY LINES
150 LBS. PER ROLL

PUSH LINES
200 LBS. PER ROLL

3" x 2" x 3/16" Angles	3" x 2" x ¼" Angles	4"-5.4# Channels
		
		



ROLLER—1.9" O.D. No. 9 Ga. Aluminum Tubing. Pressed Steel Cup secured to tubing by deep prick punching.

SHAFT—7/16" Hexagon Aluminum. Positively locked against rotation by hexagon holes in frame.

BEARING—No. 50. Slip Fit in Cup. Easily removed and replaced.

Inner race and outer race rings, heat treated, hardened, and tempered.

Inner race broached to fit on hexagon shaft, positively locking inner race against rotation.

12–1/4" Hardened Steel Balls.

Pressed Steel Outer Casing.

DUST PROTECTED ROLL—Same except equipped with No. 50-D Bearing similar No. 3-D Roll. See Page 14.

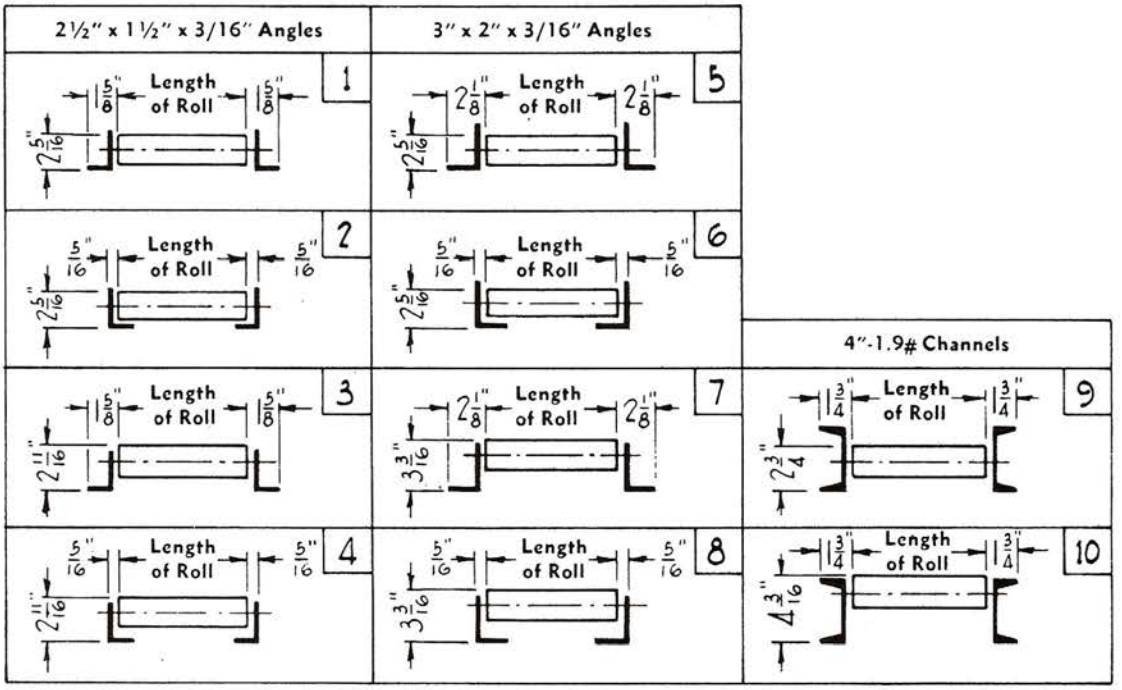
PRESSURE LUBRICATED ROLL—Similar No. 3-L Roll shown on Page 15.

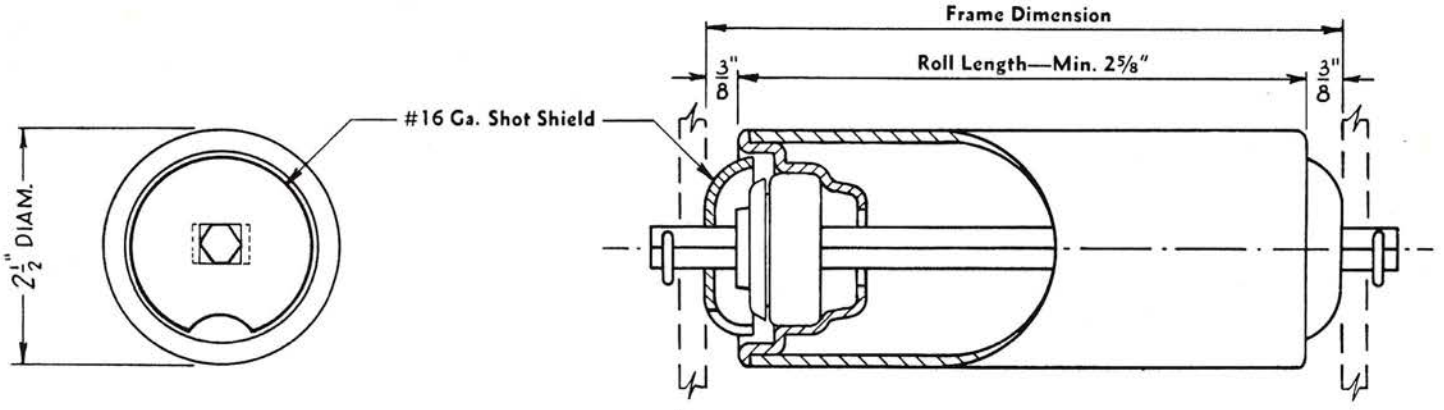
GREASE PACKED ROLL—Similar No. 3 Grease Packed Roll on Page 15.

CAPACITY

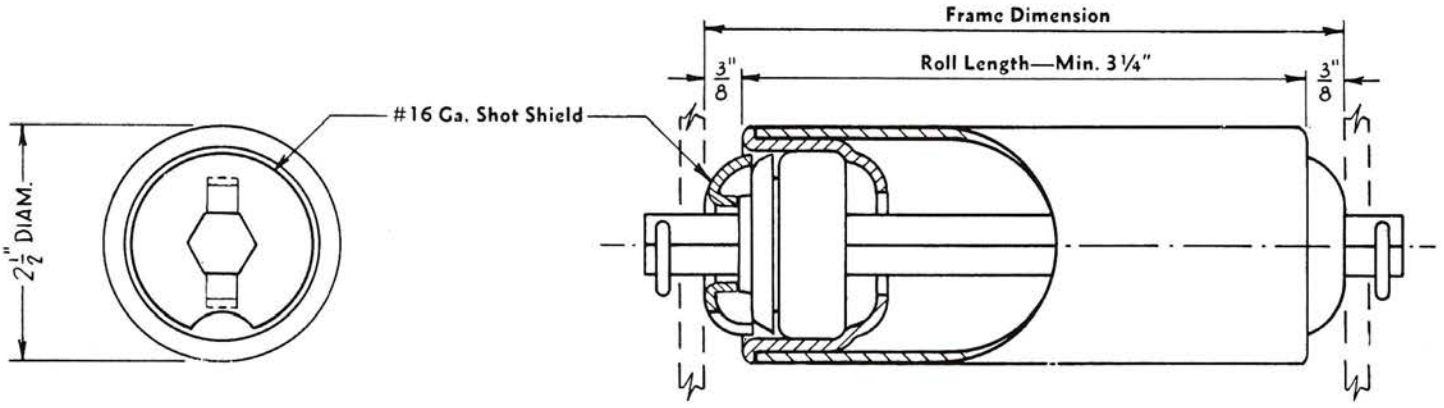
GRAVITY LINES
75 LBS. PER ROLL

PUSH LINES
100 LBS. PER ROLL

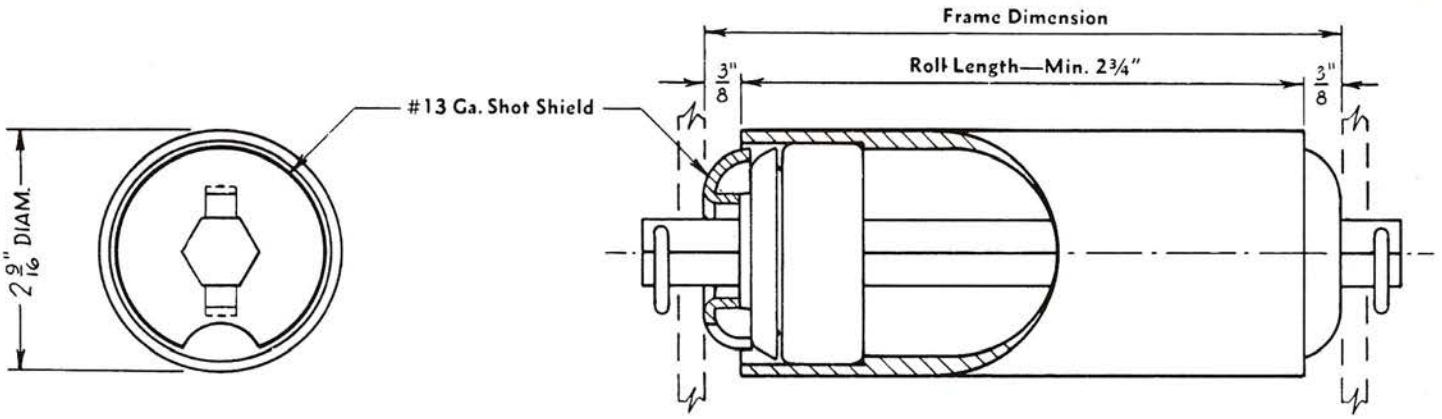




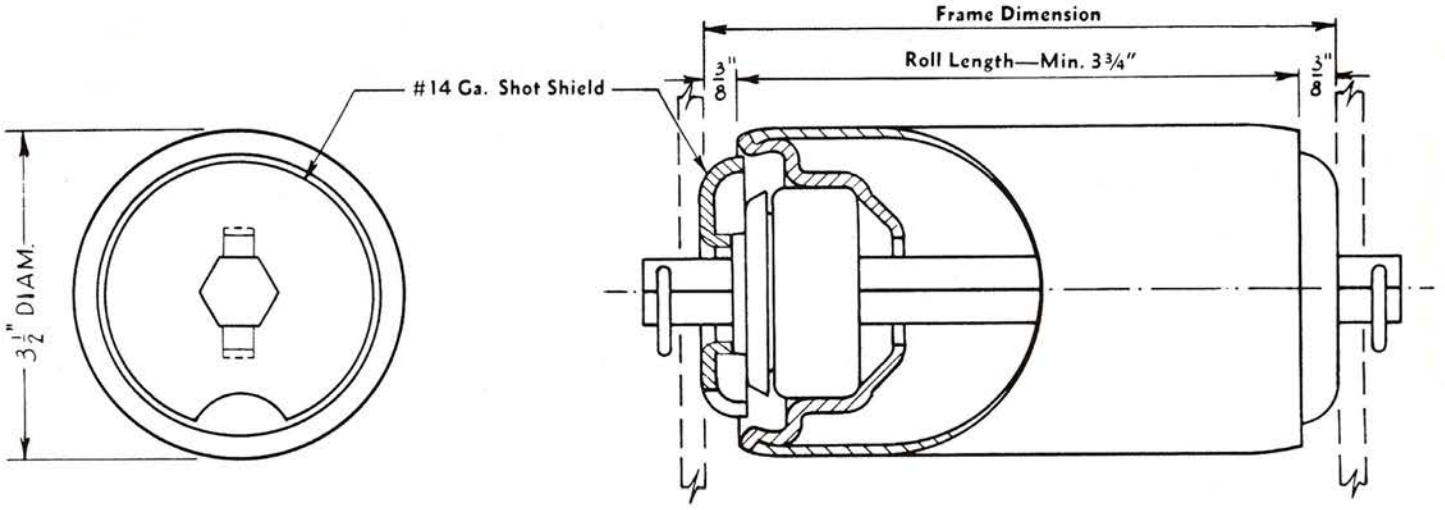
2½" DIAM. ROLLER—#14 GA. OR #10 GA.—#50-D BEARING



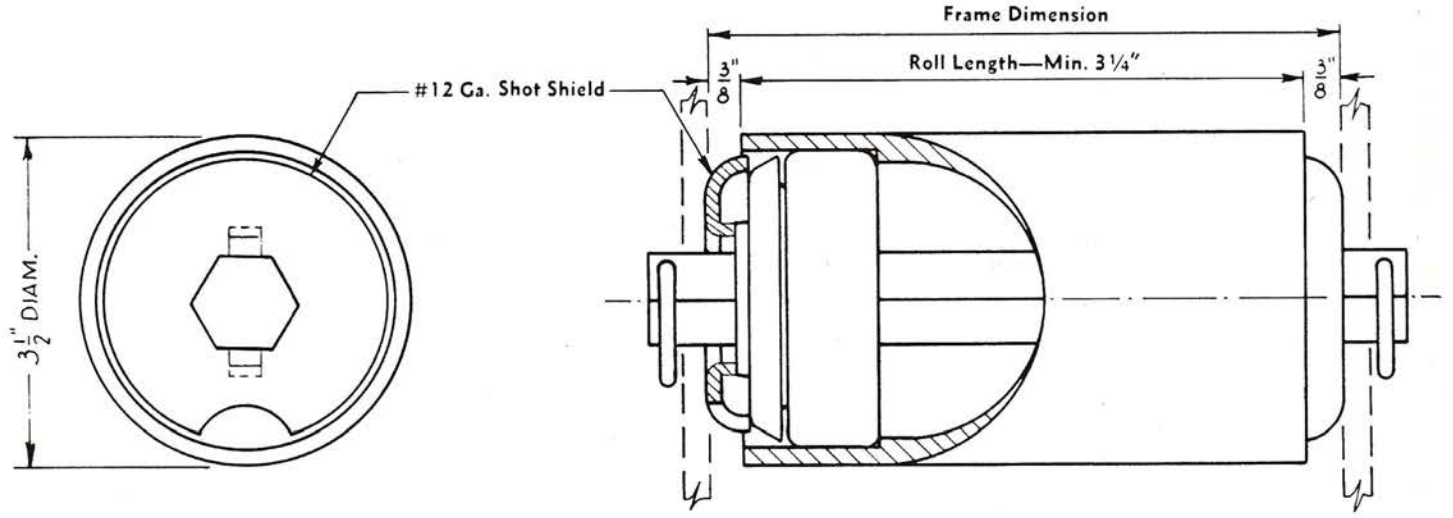
2½" DIAM. ROLLER—#10 GA.—#55-D BEARING



2-9/16" DIAM. ROLLER—#7 GA.—#60-D BEARING



3½" DIAM. ROLLER—#9 GA.—#60-D BEARING



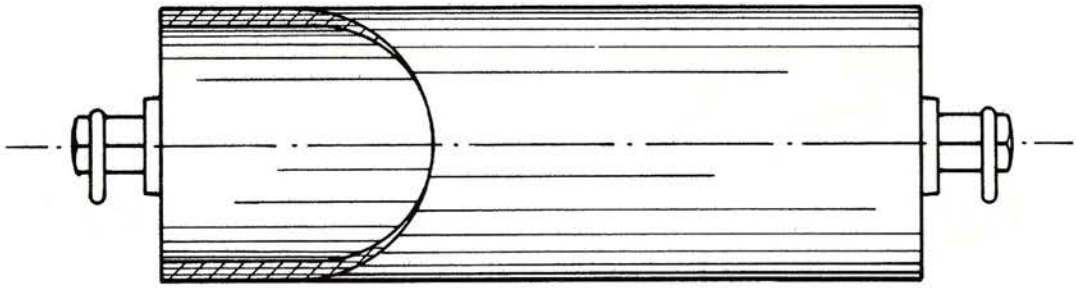
3½" DIAM. ROLLER—5/16" WALL—#70-D BEARING

GENERAL

Shot Shields are recommended for pouring lines in foundries to protect the bearings. The rounded surface tends to shed any molten metal which might be spilled or splashed during the pouring operation. The shields are stationary on the shaft so that any accumulation of metal between the shield and the frame does not foul the roller.

A hole in bottom of shield serves as a clean out for any sand or grit which might enter around shield.

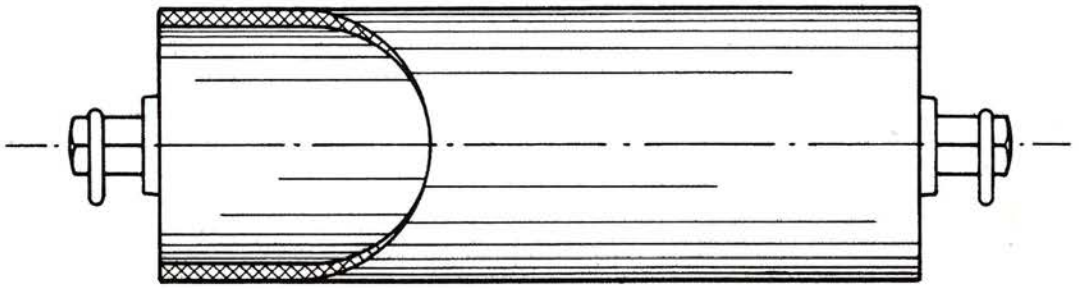
The rollers are shown with dust protected bearing construction which is ordinarily recommended for foundry service. Pressure lubrication can be added if preferred.



FIBRE COVERED ROLLS

Fibre Covered Rolls are used where a protection is necessary against the possibility of marring the surface of the article handled. Prevents discoloration or scoring which might result from direct contact with steel rolls. Frequently used in handling aluminum and brass sheets.

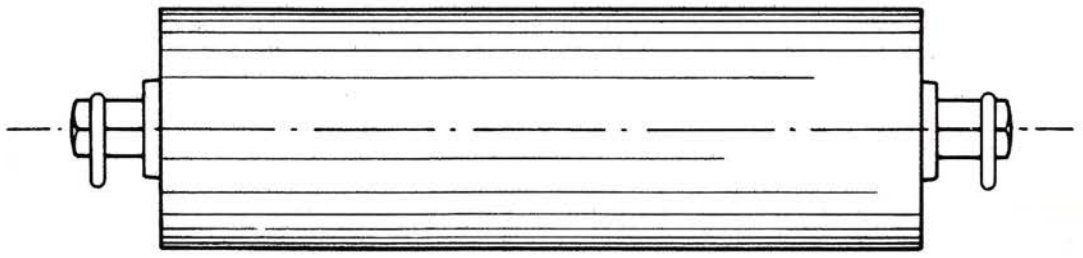
Available with all regular sizes and types of rolls. Thickness of covering is usually 1/8" but can be varied to suit conditions. Covering consists of a thermosetting plastic with either paper or canvas base and is wrapped and baked onto the steel tubing and then polished to size.



NEOPLASTIC® COVERED ROLLS

Neoplastic Covered Rolls are similar in application to Fibre Covered Rolls. Neoplastic is non-marking, oil and acid resistant, and has other qualities very similar to Neoprene. The cushioning effect is an added advantage under certain conditions particularly where finish on surface of article handled is susceptible to chipping.

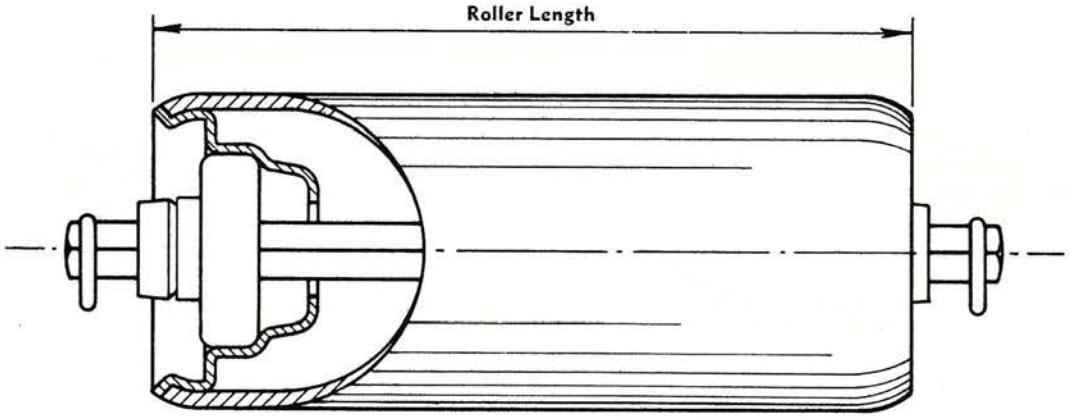
Available on all regular roll sizes and with either straight face or concave types. Thickness of covering is usually 1/8" to 3/16" depending upon the weight of package handled. Covering is bonded to surface of roll with a special primer and cured by baking. Rolls can also be furnished with natural rubber or Neoprene covering



POLISHED ROLLS

Polished Rolls are also used to prevent scoring. Frequently used in Steel Mills for handling finished sheets and also in Brass and Aluminum Mills.

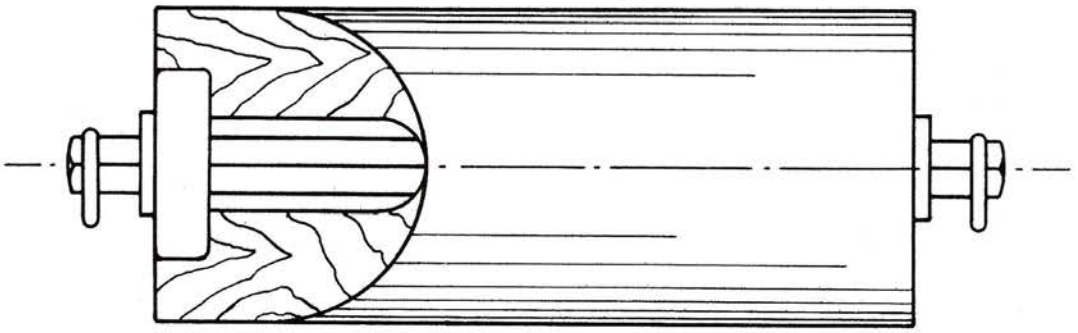
Available in all regular sizes and types of rolls. Surface of roll is ground and polished. Where necessary the rolls can be hardened to protect the polished surface.



ROUND END ROLLS

Round End Rolls are recommended for handling materials which overhang the rolls, to prevent damage to product. Used principally in container plants for handling corrugated sheets where the regular straight face rolls might form a crease at each end.

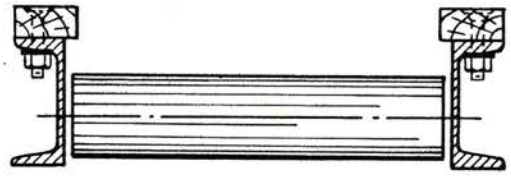
Frequently used at intersecting points and where conveyor is loaded from the side.



WOOD ROLLS

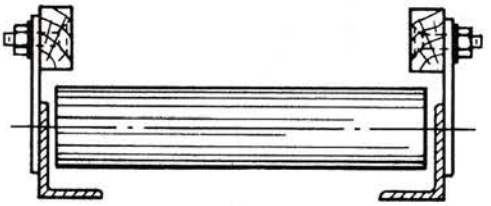
Wood Rolls are used generally where a non-sparking construction is required. Such as in handling powder or other explosives. Also occasionally used for the slight cushioning effect of the wood surface as compared to steel.

The rolls are usually 2½" O.D. with #50-S bearings and 7/16" hexagon thru steel shafts. Can be furnished in any average length. Other diameters or special shapes also available as required. Rolls can be furnished with pressure lubrication if preferred.



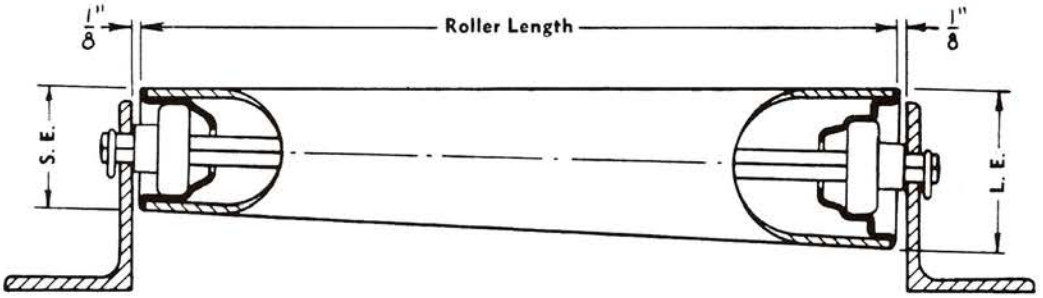
CROSS SECTION

Typical cross section of wood roller conveyor with channel frames. The wood strips on top flange of channels prevent contact with the metal frames.



CROSS SECTION

Typical cross section of wood roller conveyor with angle frames. Wood strips are used to form guard rails where required.



ROLLER—No. 10 Ga. Welded Steel Tubing. Pressed Steel Cups secured to tubing.

SHAFT—7/16" Hexagon Cold Rolled Steel.

BEARINGS—No. 50. Slip Fit in Cup. Easily removed and replaced.

DIAMETERS—See Table below for diameters of small end (S. E.) and large end (L. E.) Interpolate for L. E. diameter on odd length rolls.

LENGTHS—Available in lengths shown in Table below.

NOTE—Tapered Rolls can also be furnished Dust Protected, Grease Packed, or Pressure Lubricated.

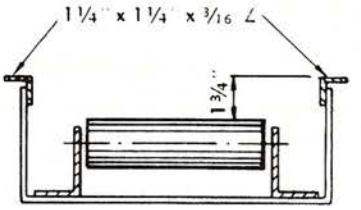
TAPERED ROLL DIAMETERS AND LENGTHS

	10 Ga. Tubing			10 Ga. Tubing			10 Ga. Tubing	
Roller Length	S. E.	L. E.	Roller Length	S. E.	L. E.	Roller Length	S. E.	L. E.
8	1 15/16	2.40	8	2 3/8	2.84	8	2 1/2	2.95
10	1 15/16	2.51	10	2 3/8	2.95	10	2 1/2	3.07
12	1 15/16	2.62	12	2 3/8	3.06	12	2 1/2	3.18
14	1 15/16	2.73	14	2 3/8	3.17	14	2 1/2	3.29
16	1 15/16	2.84	16	2 3/8	3.28	16	2 1/2	3.40
18	1 15/16	2.95	18	2 3/8	3.39	18	2 1/2	3.51
20	1 15/16	3.07	20	2 3/8	3.50	20	2 1/2	3.62
22	1 15/16	3.18	22	2 3/8	3.61			
24	1 15/16	3.29						
26	1 15/16	3.40						
28	1 15/16	3.51						
30	1 15/16	3.62						

NOTE: Rolls up to 46" lg. max.

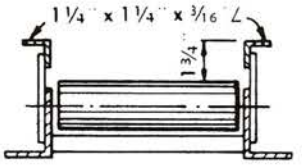
TABLE SHOWING DISTANCE REQUIRED BETWEEN GUARD RAILS FOR 2'-6" I. R. CURVES

WIDTH OF PACKAGE	LENGTH OF PACKAGE																	WIDTH OF PACKAGE
	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	30"	36"	40"	48"		
4"	6	6	6	7	7	7	7	8	8	8	8	9	9	11	12	14	4"	4"
6"	8	8	9	9	9	9	9	9	10	10	10	10	11	12	13	15	6"	6"
8"		10	10	11	11	11	11	11	12	12	12	12	13	14	15	17	8"	8"
10"			12	13	13	13	13	13	14	14	14	14	15	16	17	19	10"	10"
12"			15	15	15	15	15	15	16	16	16	16	17	18	19	20	12"	12"
14"				17	17	17	17	17	18	18	18	18	19	20	21		14"	14"
16"					19	19	19	19	19	20	20	20	21	22	22		16"	16"
18"					21	21	21	21	21	22	22	22	23	24			18"	18"
20"						23	23	23	23	24	24	24	25	26			20"	20"
22"						25	25	25	25	26	26	26	27				22"	22"
24"						27	27	27	27	27	28	28	28				24"	24"
26"							29	29	29	29	30	30	30				26"	26"
30"	Packages covered by blank spaces are seldom handled since their smallest dimension is in the direction of travel or they are of special large size and require special study and recommendations by Louisville Office.																30"	30"
36"																	36"	36"
40"																	40"	40"



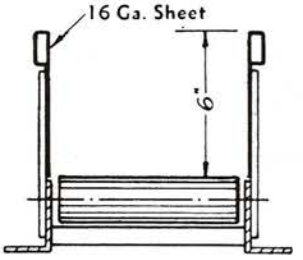
TYPE "A" GUARD RAIL

Type "AH" Guard Rail same as Type "A" except 2" x 2" x ¼" angles.

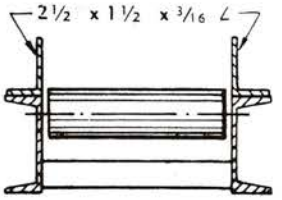


TYPE "B" GUARD RAIL

Type "BH" Guard Rail same as Type "B" except 2" x 2" x ¼" angles.

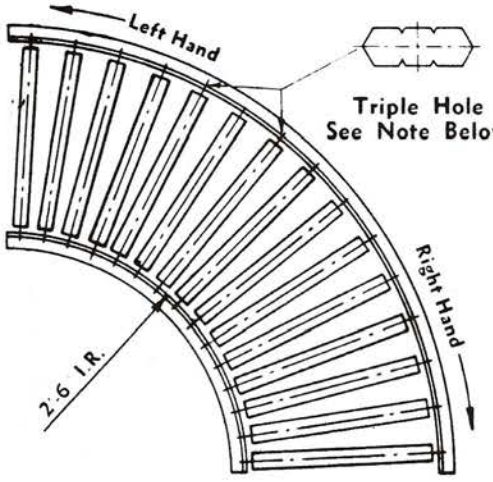


TYPE "C" GUARD RAIL

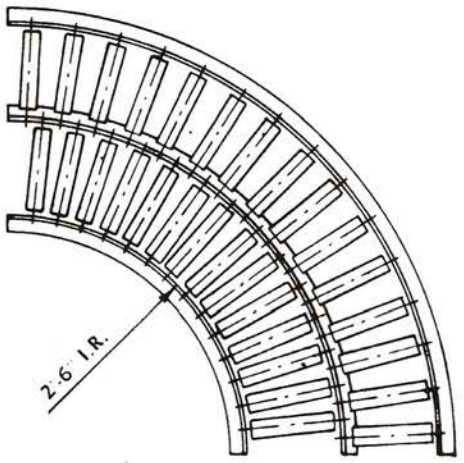


TYPE "D" GUARD RAIL

GUARD RAIL TYPES



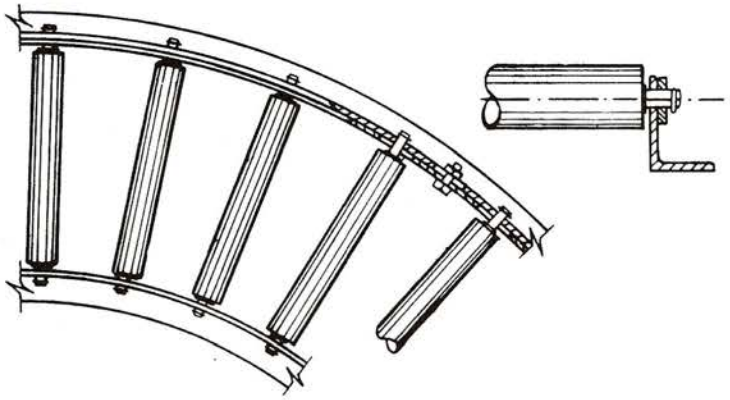
90° Curve Single Rolls



90° Curve Staggered Differential Rolls

CURVED SECTIONS

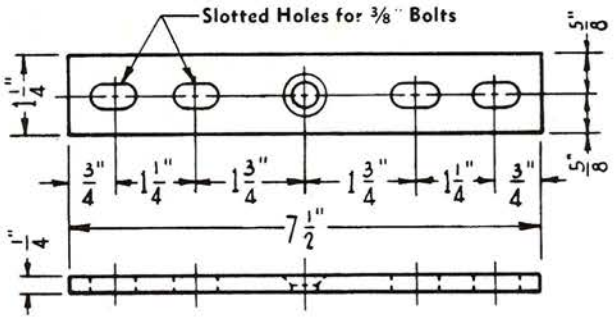
NOTE — Triple hole punching used on outside frame of all single roll curves where shafts are 11/16" hexagon or smaller. Not used on differential or tapered rolls. The shaft is assembled in center position and triple hole permits forward or backward lead adjustment in field to regulate package travel.



LOGAN ADJUSTABLE LEAD

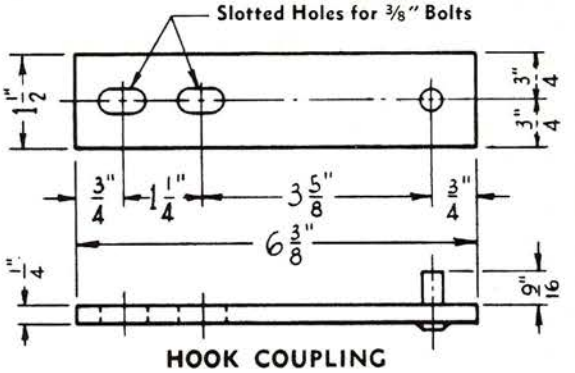
Patented

Logan Adjustable Lead (Patented) applied to curves provides a simple means of field adjustment of rolls in single roll curves. (Not necessary with differential type). It consists of an adjustable bar bolted to outside frame member, arranged to move the outside end of roller shafts longitudinally in slots in outer frame member. Recommended for single roll curves where especially fine adjustment of lead is desired.



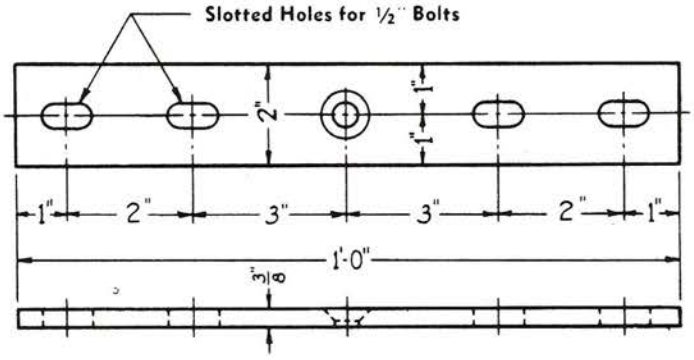
No. 1 BOLTED COUPLING

Used with Style A supports as shown on Page 52, for Classes 100-200 and 300. Couplings bolt onto top cross member of support and to each end of adjoining sections.



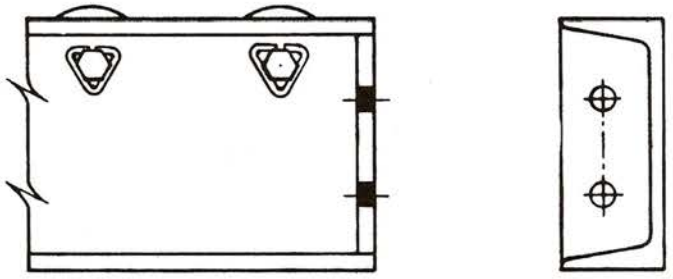
HOOK COUPLING

Used with Outdoor Portable and Style P supports as shown on Page 53, for Classes 100-P, 200-P and 300-P. Couplings bolt to end of one section and adjoining section fits over pin.



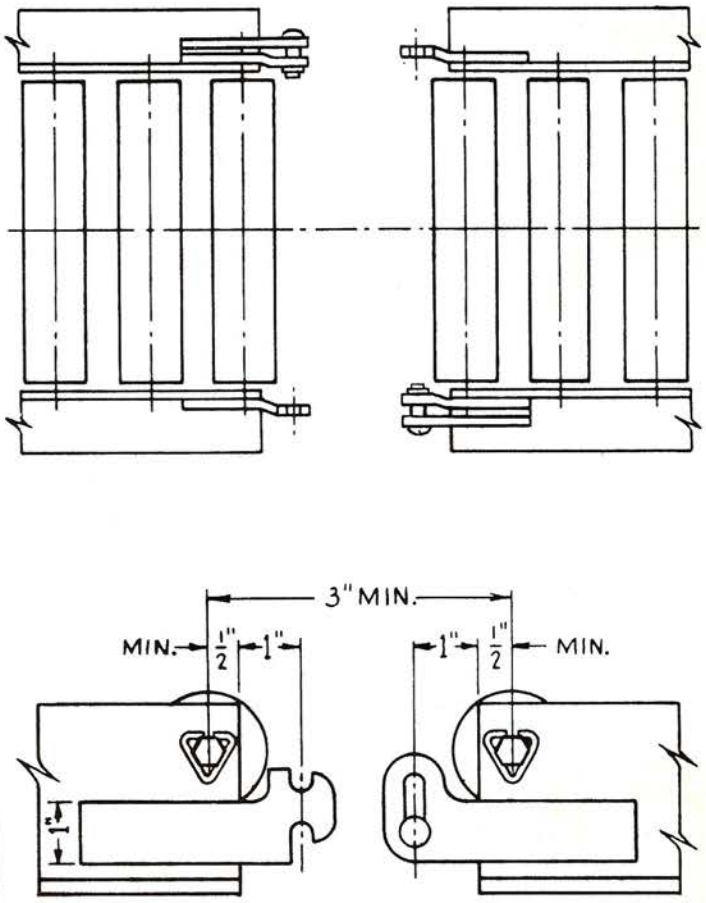
No. 2 BOLTED COUPLING

Furnished with all heavy frames except where Class 400, 500 or 600 supports with Angle Couplings are required



BUTT COUPLING

Can be furnished with channel frames where preferred. Couplings are welded to flanges and webb of channels. Sections butt together and are bolted through couplings.



UNIVERSAL COUPLINGS

Recommended on light portable sections. Couplings consist of a male and female unit on alternate ends of section. This permits inserting section into line with either end forward, thus avoiding necessity of turning sections end for end as frequently required with other types.

FRAME CAPACITIES

SAFE WORKING LOADS IN POUNDS PER FOOT (SEE NOTE BELOW)

SUPPORT SPACING	ANGLE FRAMES									
	2½"x1½"x3/16"	3"x2"x3/16"	3"x2"x¼"	3½"x2½"x¼"	4"x3"x5/16"	4"x3"x⅜"	5"x3½"x⅜"	6"x4"x½"	7"x4"x½"	7"x4"x¾"
10'-0"	25	50	65	100	185	235	380	785	1050	1500
5'-0"	125	225	300	450	725	940	1560	3250	4500	6400

SUPPORT SPACING	CHANNEL FRAMES							
	3½"—10 Ga.	3"—4.1 lb.	4"—5.4 lb.	5"—6.7 lb.	6"—8.2 lb.	7"—9.8 lb.	10"—20 lb.	10"—30 lb.
10'-0"	95	125	275	440	700	1065	2000	2700
5'-0"	400	575	1000	1750	2800	4320	8300	11000

The ratings given do not allow for the weight of the rolls, so in determining the allowable live load per foot of conveyor, the weight of the rolls used per foot of conveyor must be deducted. The weights per roller are listed in table below.

Capacities of the rolls are listed on the individual roll sheets.

The proper selection of rolls and frame requires careful consideration. The type and size of roll are in general governed by the type, size, and weight of packages handled and the conditions under which the conveyor is to operate. For smooth operation, there should be at least three rolls under the package at all times. The cost frequently governs a choice between heavy rolls on wide spacings or lighter rolls on closer spacings. Also the use of a heavy frame with supports at 10'-0" centers or a lighter frame with 5'-0" or closer spacing of supports. A three rail construction may at times be advisable, especially on wide conveyors, to permit using lighter rolls and to decrease the size of frame members required.

WEIGHTS PER ROLL						
ROLLERS	LENGTH OF ROLL					
	6"	12"	18"	24"	30"	36"
No. 1—1" Dia.	.6	1.0	1.5	1.9	2.4	2.8
No. 3—1.9" Dia.	1.9	3.2	4.5	5.9	7.2	8.5
No. 5—2¼" Dia.	1.8	2.8	3.9	4.9	5.9	7.0
No. 6—2½" Dia.	2.1	3.4	4.8	6.1	7.5	8.8
No. 7—1⅝" Dia.	1.6	2.6	3.6	4.5	5.5	6.5
No. 8—2½" Dia.	2.7	4.7	6.7	8.6	10.6	12.6
No. 9—2½" Dia.	3.9	6.2	8.5	10.8	13.0	15.3
No. 10—2-9/16" Dia.	4.8	7.8	10.7	13.7	16.7	19.7
No. 13—3½" Dia.	5.7	9.0	12.4	15.7	19.1	22.4
No. 15—3½" Dia.	10.2	16.8	23.4	30.0	36.6	43.2
No. 75—4¼" Dia.	17.7	30.0	42.3	52.6	64.9	77.3
No. 85—5" Dia.	29.1	47.6	66.2	84.8	103.3	121.9

GRADES FOR ROLLER CONVEYOR

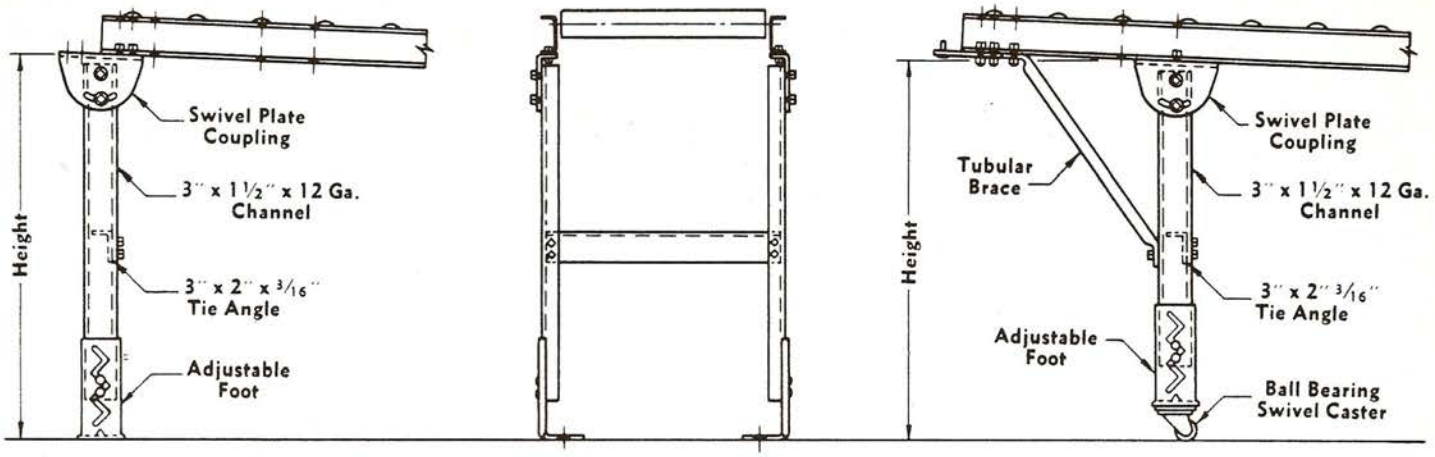
COMMODITY		PLAIN OR DUST-PROTECTED ROLLS		GREASE PACKED OR PRESSURE LUBRICATED	
		10'-0" Sec.	90° Curve	10'-0" Sec.	90° Curve
Cartons	5 to 10#	7½"	6"	..	..
Cartons	10 to 20#	6"	5"	..	..
Cartons	20 to 50#	5"	4"	7½"	6"
Crates	20 to 50#	5"	4"	7½"	6"
Crates	50 to 100#	4½"	3"	6½"	5"
Crates	100 to 250#	4"	3"	5"	4"
Wood Cases	20 to 50#	5"	4"	7½"	6"
Wood Cases	50 to 100#	4½"	3"	6½"	5"
Wood Cases	100 to 250#	4"	3"	5"	4"
Beverage Cases	Empty	6"	5"	..	..
Beverage Cases	Empty Bottles	5"	4"	..	..
Beverage Case	Filled Bottles	5"	3½"	..	..
Milk Cases	Empty	6"	5"	10"	7"
Milk Cases	Empty Bottles	5"	4"	7½"	6"
Milk Cases	Filled Bottles	5"	3½"	6"	5"
Milk Cans	Empty	5"	4"	10"	7"
Milk Cans	Full	4"	3"	6"	5"
Brick		5"	4"	..	..
Barrels	Empty	6"	5"	..	..
Barrels	Full	5"	4"	..	..
Baskets		5"	4"	..	..
Drums	150# and up	4"	3"	6"	5"
Kegs		5"	4"	7½"	6"
Tote Pans	50 to 100#	4"	3"	6½"	5"
Tote Pans	100 to 250#	3½"	3"	5"	4"
Tote Pans	250 to 500#	3"	2½"	4½"	3"

The grades listed above are in total number of inches drop required in each 10'-0" section or 90°-2'-6" I. R. curve.

Grades required for roller conveyor vary somewhat depending upon the size and spacing of rolls used. The grades suggested above are for average conditions with rolls of a size and capacity to suit the material handled.

Steel strapping on crates or cases, also twine on packages or bundles, tend to slow up travel and may require a slight additional grade.

For level push lines, the average amount of push required to start the package from rest is about 3%. With heavy loads, a pitch of about ⅛" per foot is recommended. This is not enough for the package to travel by gravity, but will decrease the amount of push necessary.



STATIONARY SUPPORT

PORTABLE SUPPORT

CLASS 201 — 3" x 1½" x 12 Ga. CHANNEL — REGULAR FEET — CAPACITY 1500 LBS.

CLASS 301 — 3" x 1½" x 12 Ga. CHANNEL — REINFORCED FEET — CAPACITY 2500 LBS.

Stationary Supoprts					Portable Supports — Class 201-P				
Sizes	Adjustment Range Min. Height	Max. Height	Tie Angle	Braces	Sizes	Adjustment Range Min. Height	Max. Height	Tie Angle	Braces
Y-1	See	Notes	None	None	Y-1P	See	Notes	None	None
Y-2	10 13/16"	13 3/16"	None	None	Y-2P	14 1/16"	16 7/16"	None	None
Y-3	12 1/16"	14 7/16"	None	None	Y-3P	15 5/16"	17 11/16"	None	None
Y-4	13 9/16"	15 15/16"	None	None	Y-4P	16 13/16"	19 3/16"	None	None
Y-5	14"	20"	1	None	Y-5P	17 1/4"	23 1/4"	1	None
Y-6	18"	24"	1	On 301 Only	Y-6P	21 1/4"	27 1/4"	1	With Braces
Y-7	22"	28"	1	On 301 Only	Y-7P	25 1/4"	31 1/4"	1	With Braces
Y-8	26"	32"	1	On 301 Only	Y-8P	29 1/4"	35 1/4"	1	With Braces
Y-9	30"	36"	1	On 301 Only	Y-9P	33 1/4"	39 1/4"	1	With Braces
Y-10	34"	40"	1	On 301 Only	Y-10P	37 1/4"	43 1/4"	1	With Braces
Y-11	38"	44"	1	On 301 Only	Y-11P	41 1/4"	47 1/4"	1	With Braces
Y-12	42"	48"	1	On 301 Only	Y-12P	45 1/4"	51 1/4"	1	With Braces
Y-13	See	Notes	2	On 301 Only	Y-13P	See	Notes	2	With Braces

NOTES

Y-Series supports have swivel plates at top for attaching to conveyor sections. This permits adjusting support to slope of conveyor. These supports are for single lane two-rail conveyor only.

On stationary supports the swivel plate serves as a coupling for joining sections together. Supports at end of line should set back from end of section.

Portable supports also set back from end of section with braces attached as shown in sketch above. Separate pin type hook couplings are provided for joining sections together.

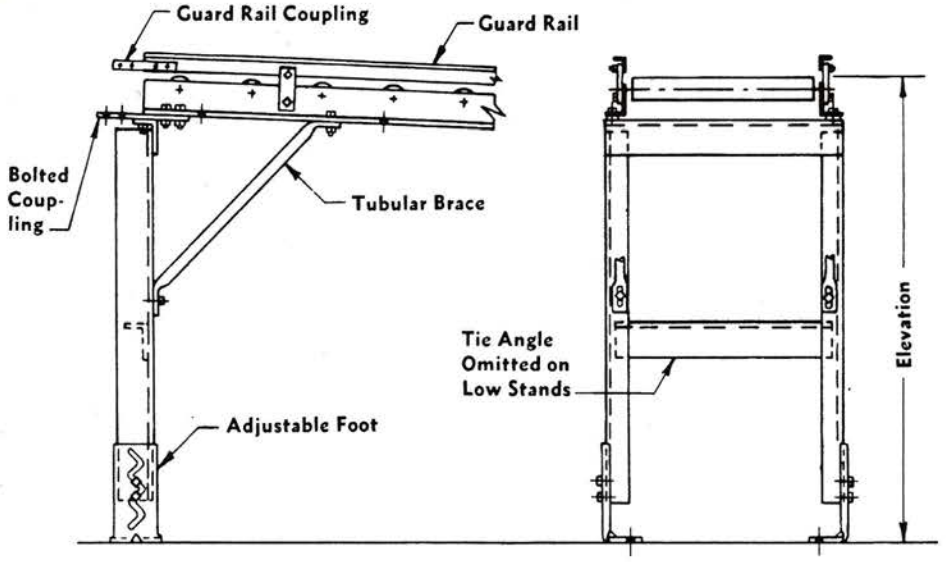
Stationary supports sizes Y-2 to Y-12 inclusive and portable supports Y-2P to Y-12P inclusive can be shipped from stock. Sizes with no tie angles are bundled in pairs. Heights listed are to top of supports or underside of conveyor frame.

Size Y-1 supports are non-adjustable and made-to-order. Available in heights from 5¼" to 11¼". The same applies to Y-1P except heights range from 8½" to 14½".

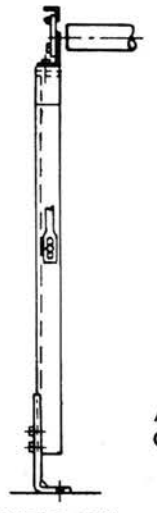
Supports above the range of stock sizes are also made-to-order and designated as Y-13 or Y-13P sizes. These have pressed steel feet allowing 6" adjustment. Heights should be figured with feet in the mean position.

Braces can be furnished, if requested, with Class 201 stationary supports the same as indicated for 301 only

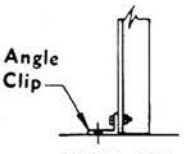
Single leg supports for center of curves should be designated by suffix letter "C".



STATIONARY SUPPORT



STYLE "C"



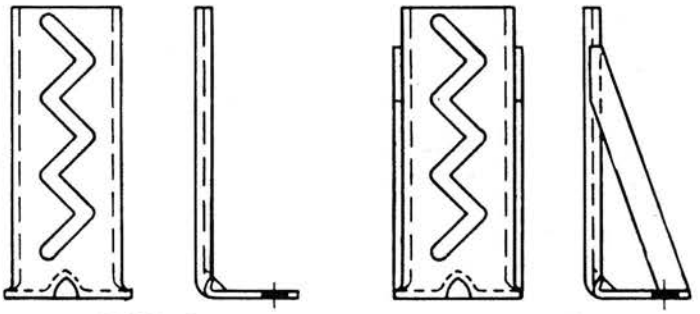
FOOT FOR No. 10 SUPPORT

Style "A" supports, with bolted couplings, are used for stationary conveyor where sections join together.

Style "B" supports, without couplings, are used for stationary conveyor at ends of line, or where supports are required at center of sections.

Style "C" single leg supports are used as center supports under outside frame member of curves.

Style 10A-10B-10C are used where there is not sufficient clearance under conveyor for adjustable foot. The angle clip may also be used on any other style support if no adjustment is necessary.



REGULAR **REINFORCED**

ADJUSTABLE FEET

Adjustable feet are pressed steel from 3/16" thick material.

The special zig-zag slot construction eliminates slippage that frequently occurs with feet having vertical slots.

To meet special conditions, similar feet having 12" adjustment are also available.

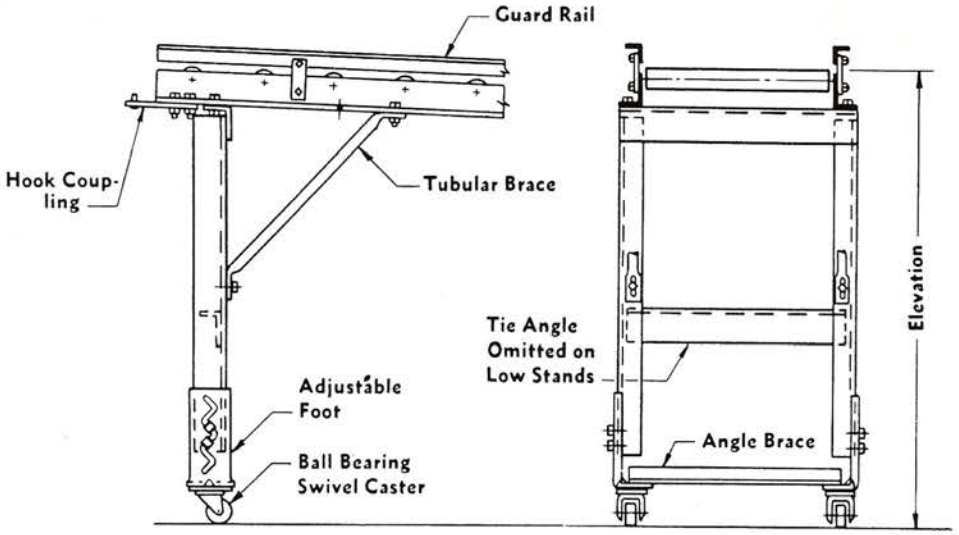
NOTES

In specifying conveyor elevations, give height from floor to top of rolls.

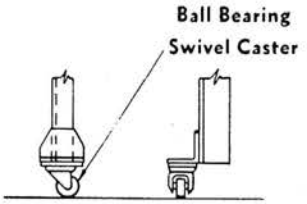
Heights listed in table are to top of support with adjustable feet in their center position. Capacities listed are for double leg supports.

CLASS 100 – 2" x 1½" x 3/16" ANGLES – REGULAR FEET – CAPACITY 750#					
CLASS 200 – 3" x 2" x 3/16" ANGLES – REGULAR FEET – CAPACITY 1500#					
CLASS 300 – 3" x 2" x ¼" ANGLES – REINFORCED FEET – CAPACITY 2500#					
Sizes	**Max. Height**	**Min. Height**	**Adjustment**	**Braces**	**Tie Angle**
10-A, B & C	10"	5¼"	None	None	None
15-A, B & C	15⅜"	10¼"	2⅜"	None	None
20-A, B & C	20"	15½"	6"	None	None
30-A, B & C	30"	20⅛"	6"	With Braces	None
48-A, B & C	48"	30⅛"	6"	With Braces	With Tie Angle
72-A, B & C	72"	48⅛"	6"	With Braces	With Tie Angle

Note: No Brace Under
2' - 1" To Support

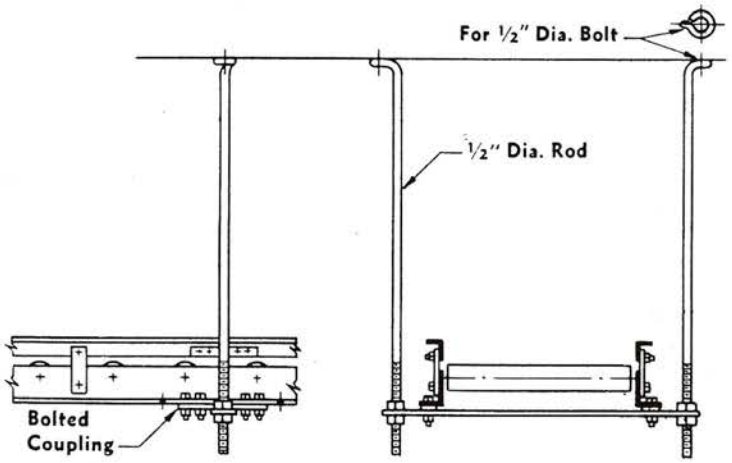


PORTABLE SUPPORT



FOOT FOR No. 10-P. SUPPORT

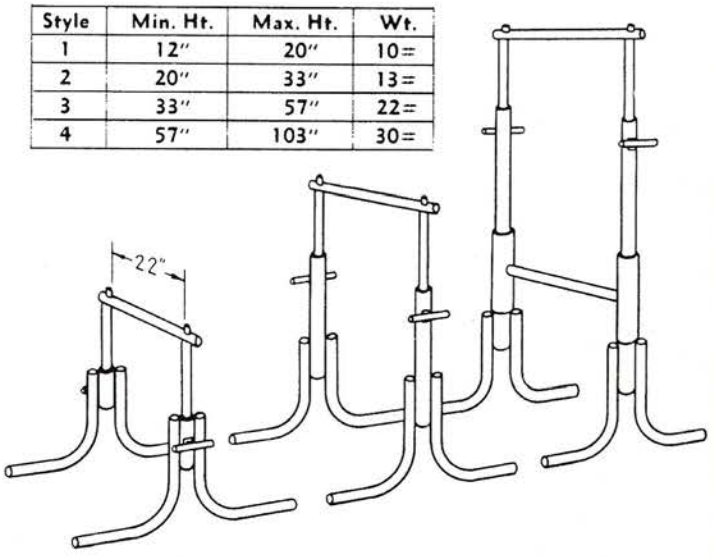
CLASS 100-P – 3" x 2" x 3/16" ANGLES – REGULAR FEET – 2½" DIA. 1¼" FACE CASTER – CAP. 500=					
CLASS 200-P – 3" x 2" x 3/16" ANGLES – REGULAR FEET – 4" DIA. 1½" FACE CASTER – CAP. 1000=					
CLASS 300-P – 3" x 2" x ¼" ANGLES – REINFORCED FEET – 5" DIA. 2" FACE CASTER – CAP. 2000=					
Sizes	Max. Height	Min. Height	Adjustment	Braces	Tie Angle
10-P	13"	9¼"	None	None	None
15-P	15⅜"	13¼"	2⅜"	None	None
20-P	20"	15½"	2⅜"	None	None
30-P	30"	20⅛"	6"	With Braces	None
48-P	48"	30⅛"	6"	With Braces	With Tie Angle
72-P	72"	48⅛"	6"	With Braces	With Tie Angle



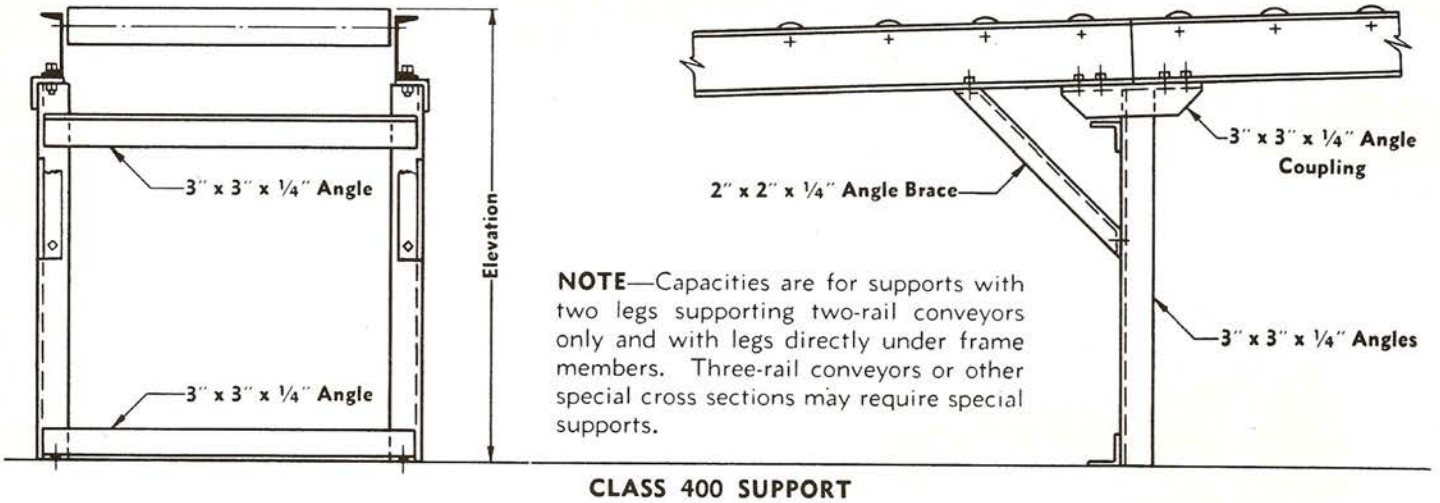
HANGERS

Bottom ends of hangers are threaded to allow 8" adjustment. Top ends of hanger rods can be threaded for ceiling inserts if preferred.

Style	Min. Ht.	Max. Ht.	Wt.
1	12"	20"	10=
2	20"	33"	13=
3	33"	57"	22=
4	57"	103"	30=

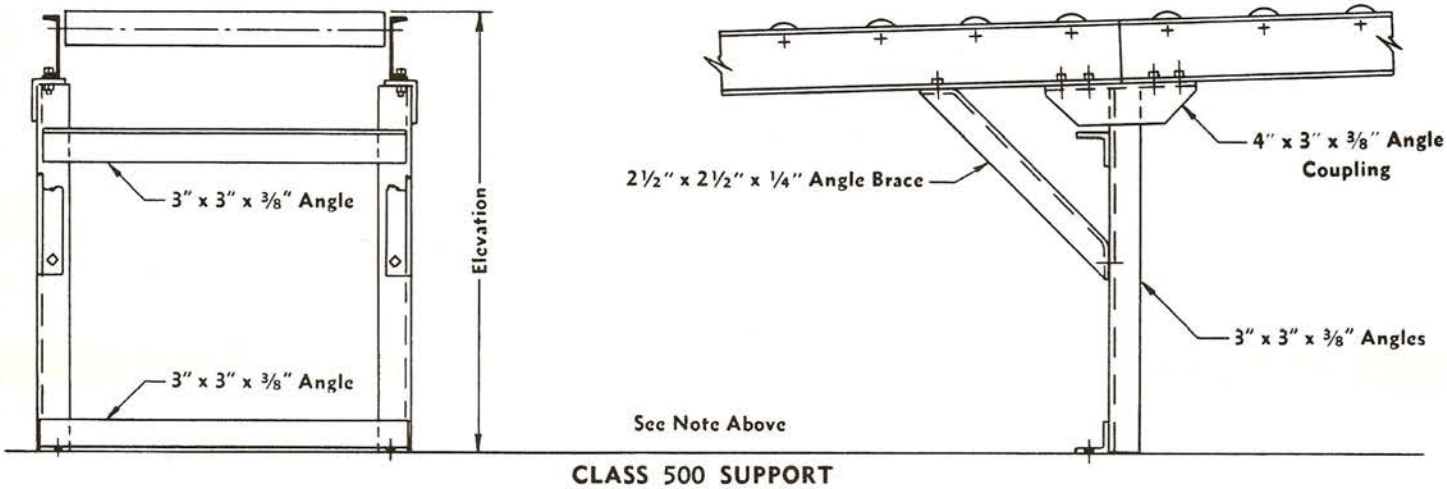


OUTDOOR PORTABLE SUPPORTS
Average Capacity 350 Lbs. Each

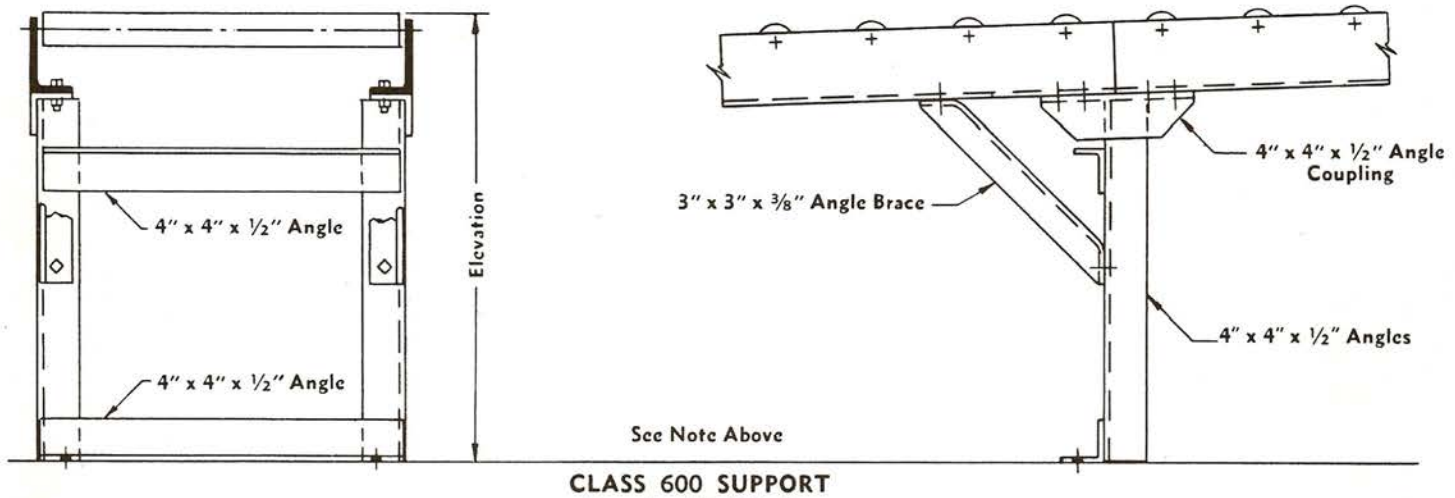


NOTE—Capacities are for supports with two legs supporting two-rail conveyors only and with legs directly under frame members. Three-rail conveyors or other special cross sections may require special supports.

CLASS 400 SUPPORT
Capacity 5,000 lbs.



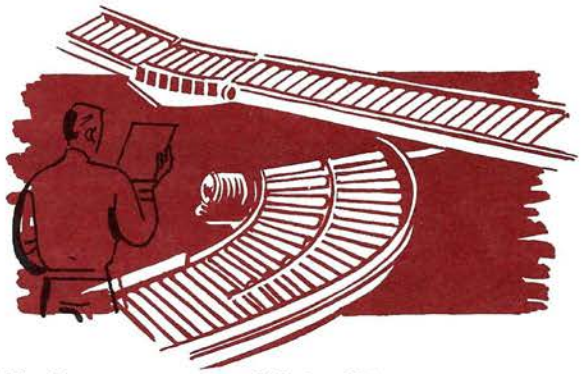
CLASS 500 SUPPORT
Capacity 12,500 lbs.



CLASS 600 SUPPORT
Capacity 25,000 lbs.

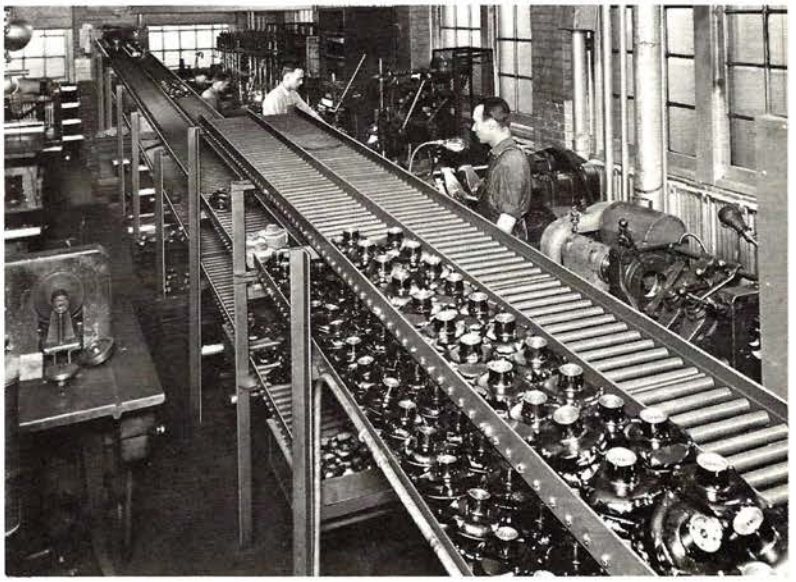
Note: No Brace Under 2' - 0" To Support

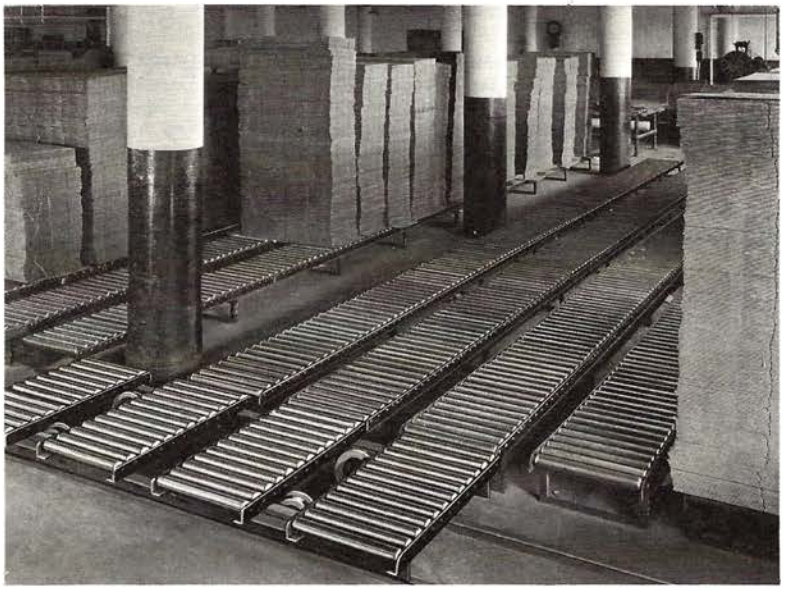
SPECIAL SECTIONS



THE views on pages 55 to 57 inclusive and the details on the pages immediately following are typical of many Special Sections available in Logan Roller Conveyor. These are individually engineered to meet the exact requirements of each job thus insuring best results and maximum efficiency.

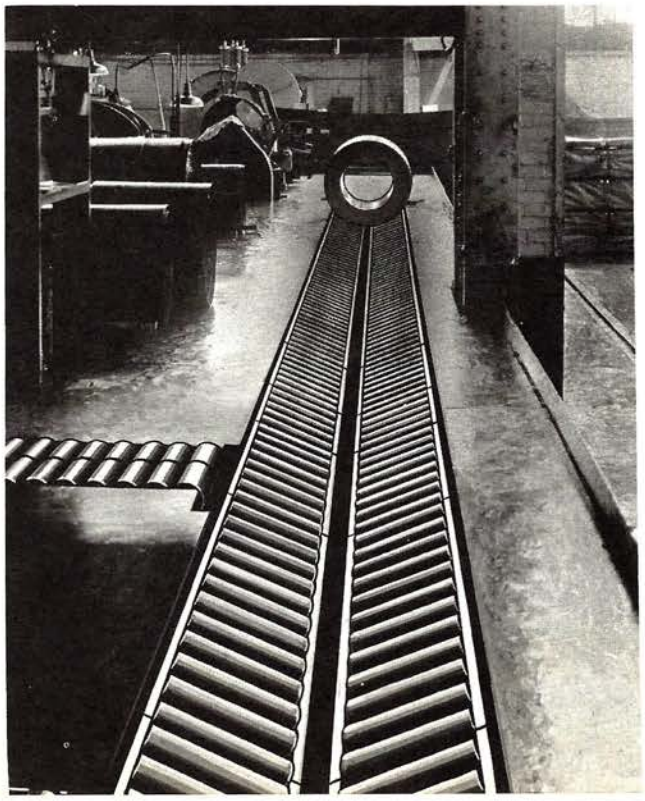
BELOW: Machining and assembly operations in a plant manufacturing electrical equipment. The conveyor is three-rail type with center rail projecting above surface of rolls dividing each line into two lanes. Material is received on lower decks and then placed back on upper decks to next operation.





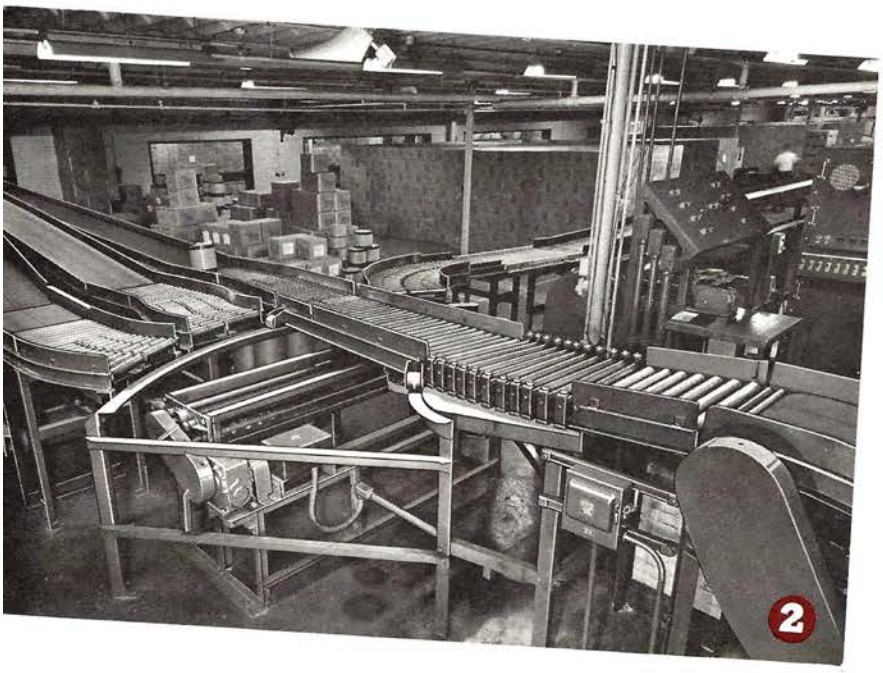
ABOVE: Roller Conveyor Storage, in a large corrugated container plant, following the "printing and slotting operations" and just ahead of "folding and taping." Transfer car in foreground. By placing parallel storage lines close together, larger cartons are supported on two or more lines of conveyor. A similar storage arrangement is used between "slitting" operation and "printing and slotting."

BELOW: Troughed Roller Conveyor formed by two lines of conveyor mounted in suitable saddles. This line of Troughed Rolls handles heavy coils of steel coming from pickler. A Scale Section is inserted in the line and coils are weighed and tagged enroute to storage.



In this plate shop of a prominent West Coast shipyard, Logan Ball Pedestals are contributing to the speedy and efficient handling of ship plates. Plates can be moved easily in any direction over the ball tops, and the Pedestals allow workers to move freely around their work throughout the entire area. See page 61 for details.

This patented Logan Alligator Switch, in wholesale drug warehouse, permits discharge of cases from one incoming line to any one of four distributing lines. The flexible pivot end of switch is power operated and controlled from panel shown in upper right corner. The compensating rolls are mounted in individual carriages and are automatically kept radial and in proper alignment for all positions of pivot end.

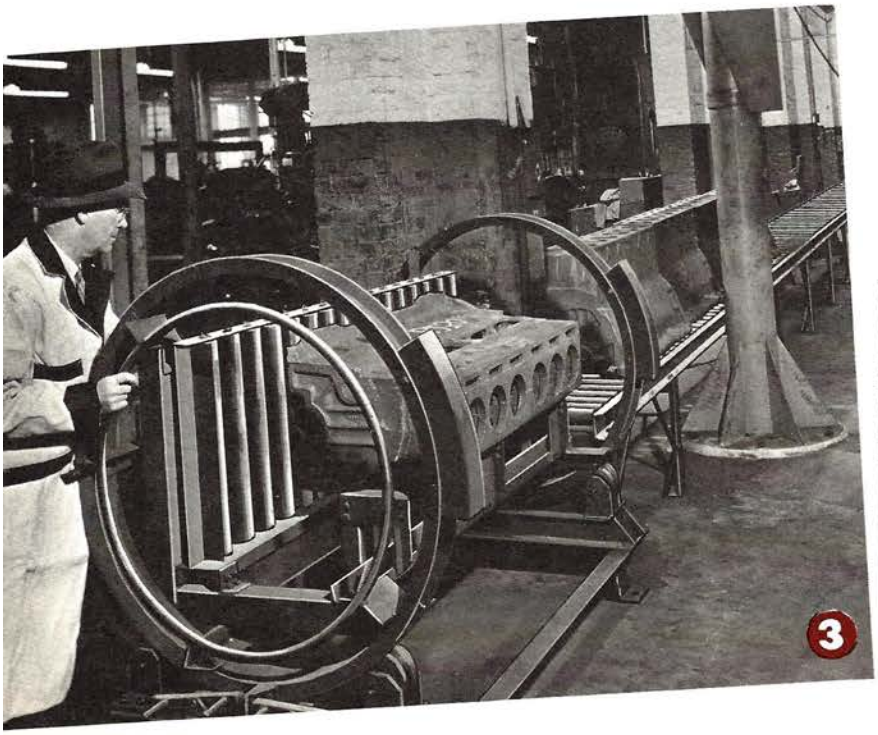


Engine block castings in the internationally known Diesel engine plant, enter the machining department from the foundry on Roller Conveyor and are temporarily stored there. As needed, they are turned over on their side in the 90° Roll-Over, as shown, and picked up by a crane which transfers them to the first machining operation. All danger to workmen, damage to castings, loss of floor space and time are thus eliminated.

A pivoted type Switch Section in a large wholesale drug plant. Switch is manually operated and receives baskets either from the line of Gravity at left or the Roller Spiral at right. This type of Switch is usually limited to serving three branch lines. The package travel can be from branch lines to main line, as shown here, or vice versa.

Coils of aluminum foil are crated for shipment on parallel lines of Logan Roller Conveyor. Lines converge to Scale Section in foreground for weighing enroute to storage or shipment. Handling costs are reduced to a minimum.

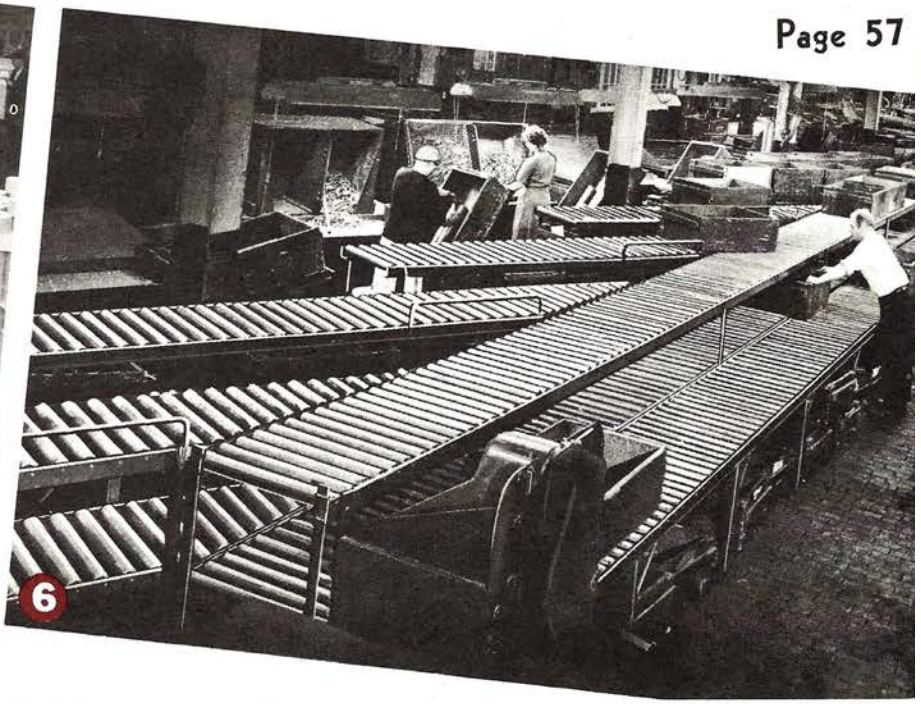
Double deck lines of Roller Conveyor fed by spur lines. These spurs are also double deck and have intersecting portions feeding onto main lines. Conveyors handle tote boxes of piston rings from inspection and storage to packing and shipment.

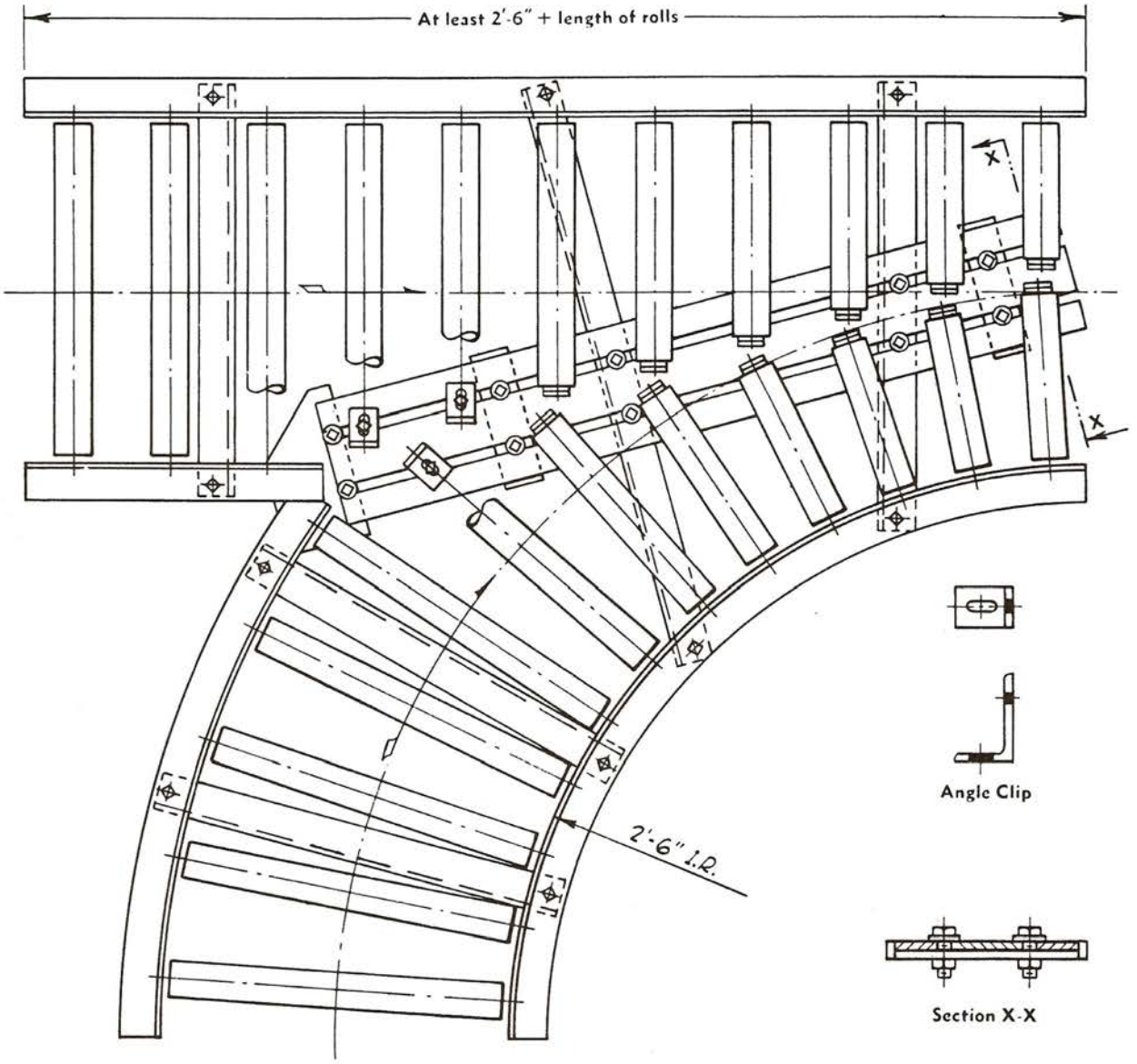


After nailing and strapping, heavy boxes of bolts and nuts are upended to conserve space on Roller Conveyor storage lines. Tilter starts automatically as soon as it receives box and returns automatically to starting position after load is discharged. Alligator Switch, in foreground above, dispatches boxes to different storage lines. Kegs are headed up on Roller Conveyor line in rear.

Roller Conveyor is ideally adapted for use as storage lines. Frequently mounted in groups to form Roller Conveyor Storage Racks. The Storage Rack shown above is in the small motor division of a large manufacturer of electric motors. It contains fifty separate lines of Roller Conveyor forming a large "bank" for small motor parts. Any different part is easily accessible, and as each part is removed another rolls into place. No space lost for trucking aisles.

Molds are assembled on level lines of Roller Conveyor and pushed on to Logan Transfer Car which delivers molds to a series of long pouring lines of conveyor in adjacent bay. Rolls in pouring lines are protected by shot shields as shown on pages 42 and 43. Transfer Cars provide an economical link, and give flexibility to conveyors in minimum space.

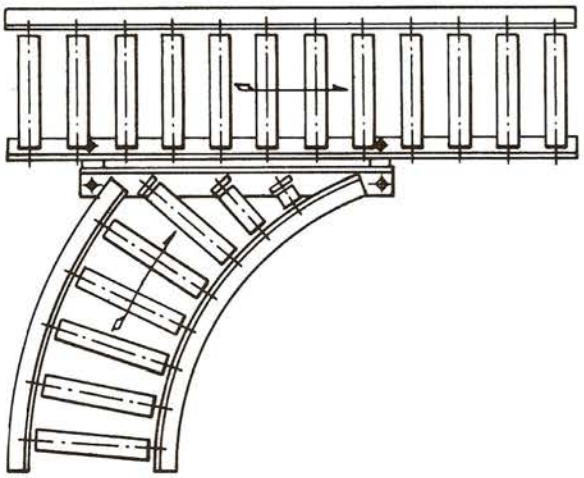




NOTES

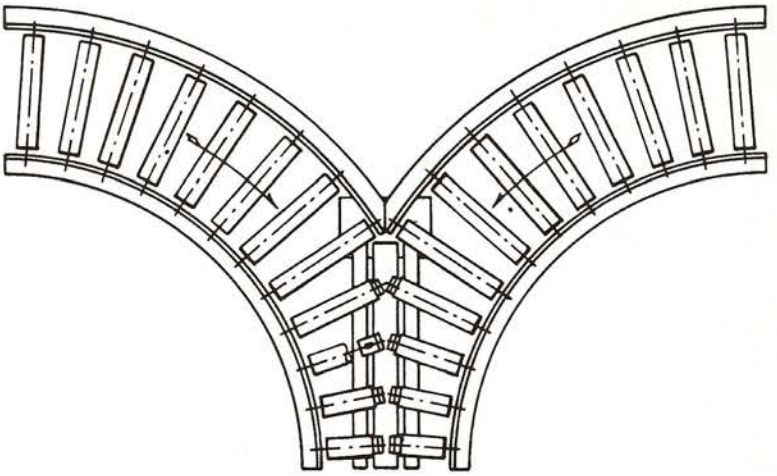
Converging Sections and Y-Sections rarely give ideal operation by gravity due to possible interference of packages at converging point. When used in the opposite direction of arrows, packages must be helped across intersection manually. Where a switch section can be used instead, it is always recommended.

For maximum efficiency the inside ends of rolls are mounted on individual angle clips. These are adjustable and permit varying the lead of the rolls as an aid in transferring the packages. Items with chimes on bottom, such as drums or barrels, require special construction with converging ends of rolls overlapping.



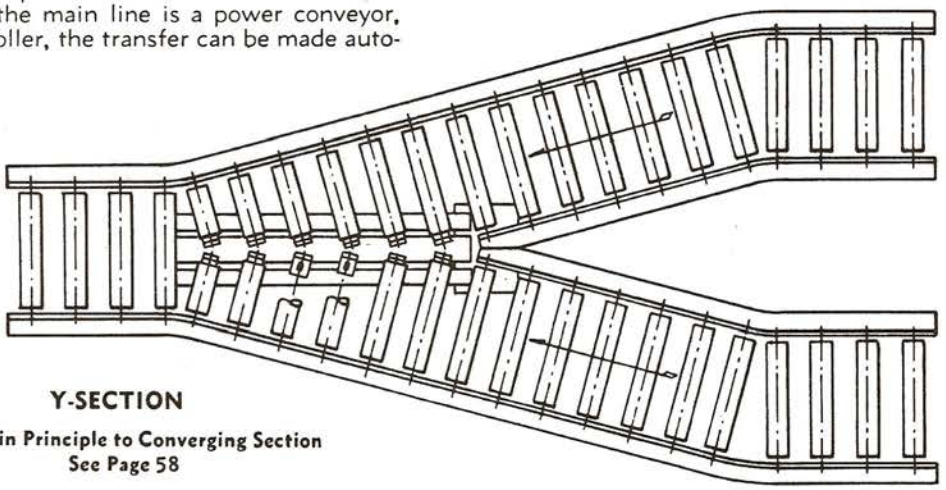
INTERSECTING SECTION

Intersecting sections are generally used for auxiliary lines delivering into main line. When used in either direction packages require manual assistance across intersection. Where the main line is a power conveyor, such as belt or live roller, the transfer can be made automatically.



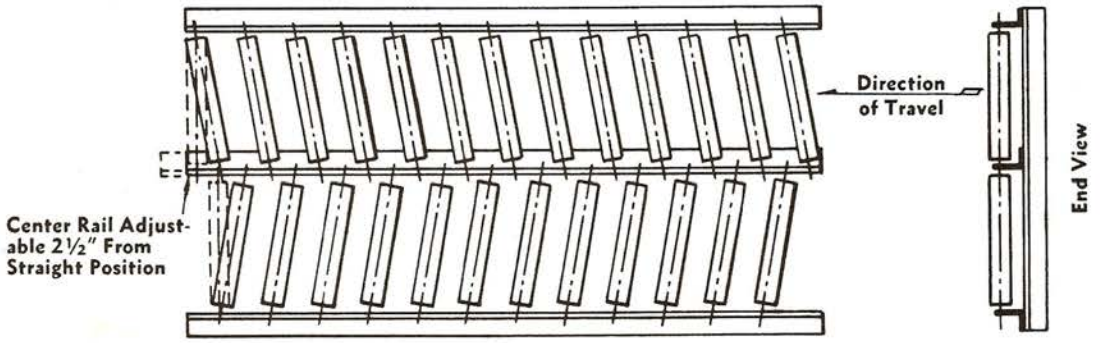
CONVERGING CURVES

See Page 58



Y-SECTION

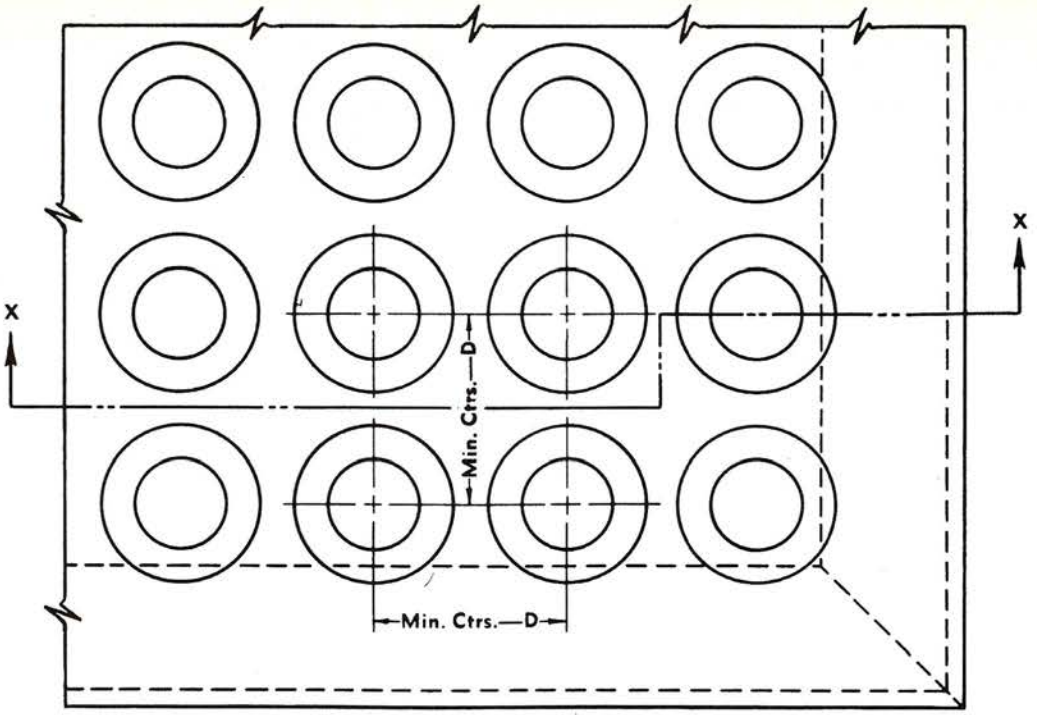
Similar in Principle to Converging Section
See Page 58



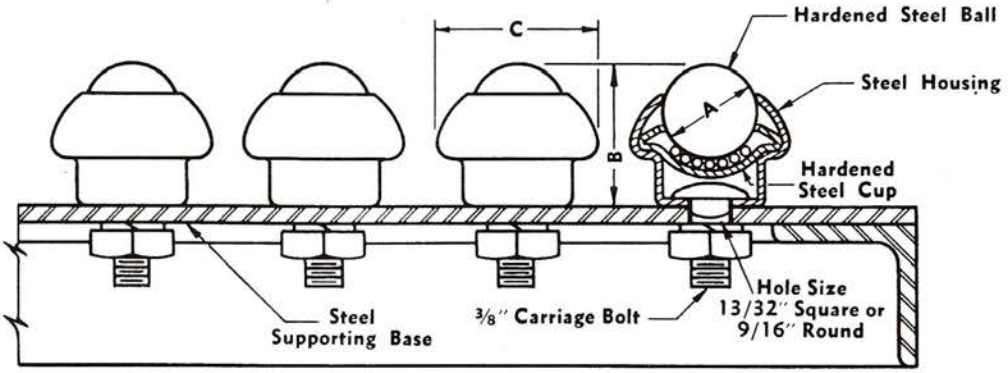
HERRINGBONE SECTION

Herringbone conveyor not only centers the package, but also retards the speed. It will handle most packages weighing from 5 to 60 pounds without excessive speed on a grade of 2½" to the foot. Center rail is adjustable so speed of package can be regulated in field. It is sometimes advisable to make center rail stationary and use adjustable lead strips (Patented) on outside rails to regulate herringbone effect.

When a herringbone conveyor discharges onto roller conveyor (or any other type), it is necessary to include a curved cleanout section of close centered roller conveyor at discharge end because of the sudden change in pitch.



PLAN



SECTION X - X

DATA AND DIMENSIONS								
Size of Unit	Working Cap Per Ball Unit	A	B	C	D	Dia. of Bearing Balls	Gauge of Cup	Gauge of Housing
1-C	50 lbs.	1"	1 1/2"	1 17/32"	1 3/4"	1/8"	18	16
1-B	75 lbs.	1 1/8"	1 21/32"	1 25/32"	2"	5/32"	18	16
2-B	100 lbs.	1 1/2"	2 1/8"	2 5/16"	2 3/8"	3/16"	16	16

NOTES

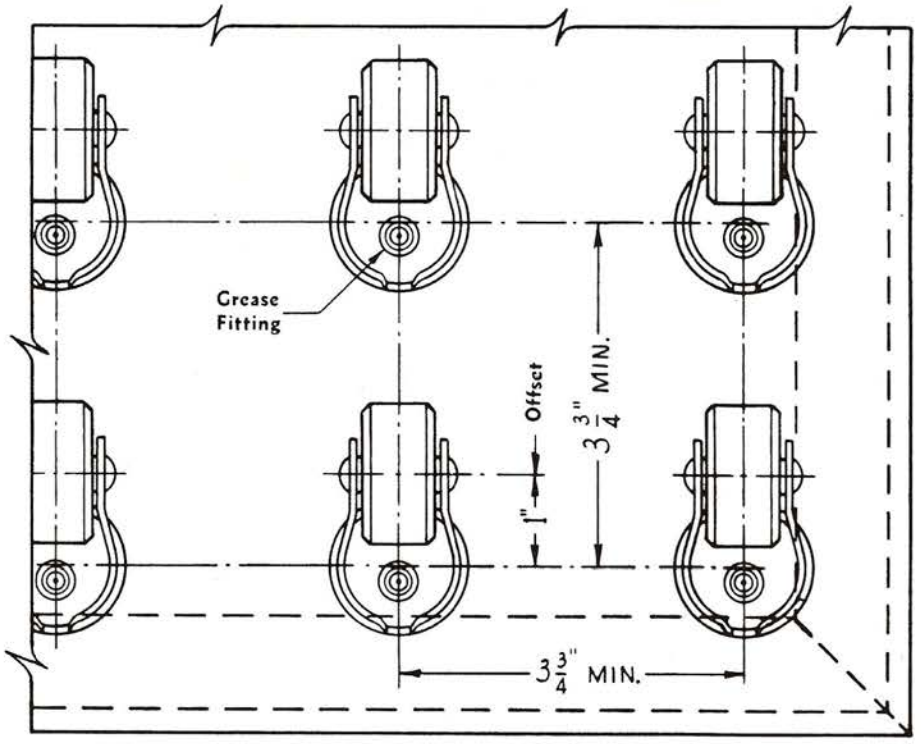
Ball Transfers are used where packages must be transferred at right angles without turning the package or where it is desired to turn packages without lifting.

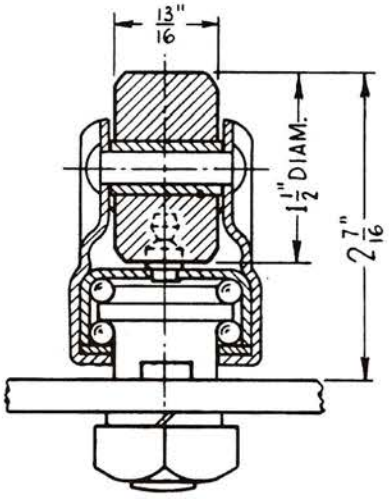
Spacing of ball units varies with the weight, size, and nature of material handled. Packages must have smooth, firm bottoms. Soft wood boxes require closer spacing than containers having rigid bottoms of hard wood or metal. Not recommended for fibre cartons. There should be a minimum of nine ball units under each package.

The large ball rotates on a bed of small balls contained in a hardened steel cup. All balls are hardened steel. The ball unit is made as nearly dust proof as practical. Single bolt design permits easy removal for cleaning if necessary. Unit should be rinsed in kerosene.

The steel supporting plate is usually 3/16" thick. Heavier plates can be furnished when necessary.

Ball Transfers are usually furnished complete, including supporting plate and reinforcing members. However, separate ball assemblies can be furnished.





DETAIL OF CASTER

The caster is double row ball bearing type with solid steel wheel. The swivel is dust protected and arranged for pressure lubrication. Capacity 75# each.

CASTER TABLES

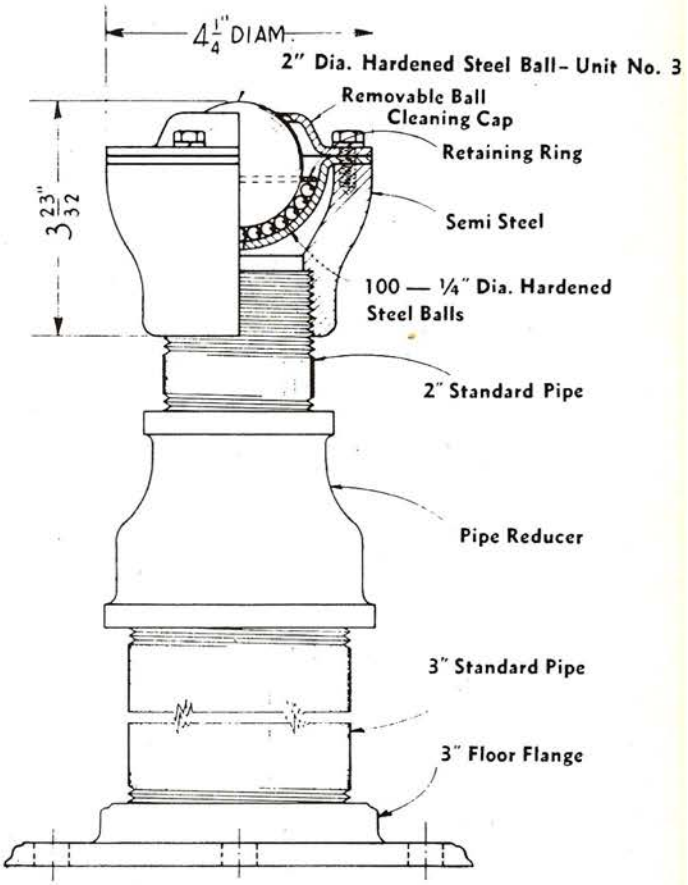
These tables are similar in application to Ball Transfer Tables shown on Page 60. Due to the larger carrying surface there is less tendency for the wheels to become imbedded in bottom of packages. This is an advantage in handling soft wood boxes and also permits handling some types of fibre cartons.

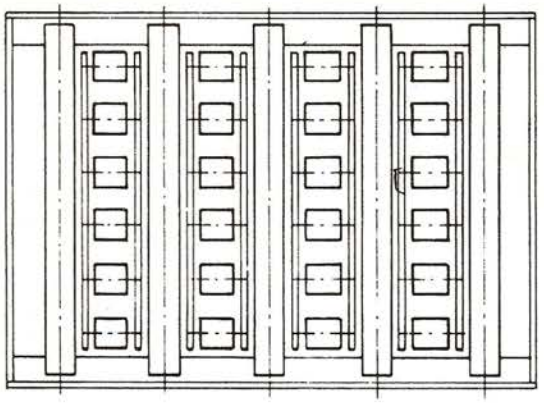
Caster Tables are particularly recommended over Ball Transfer Tables where there is any amount of dust or dirt present.

BALL PEDESTALS

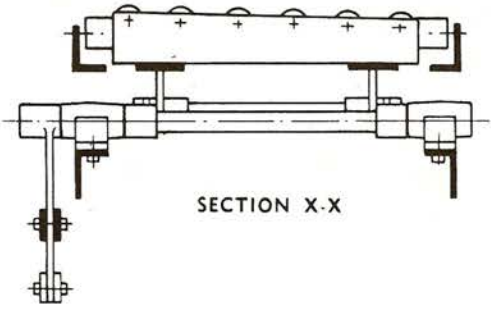
The Ball Transfer unit at top of Pedestal consists of a large steel ball which rotates on a bed of smaller balls contained in a hardened steel cup. The balls are protected by a removable cleaning cap. Any dust which may get into the unit is normally worked out through the small hole in bottom of cup by the movement of the balls. The unit at right has a capacity of 300 pounds each.

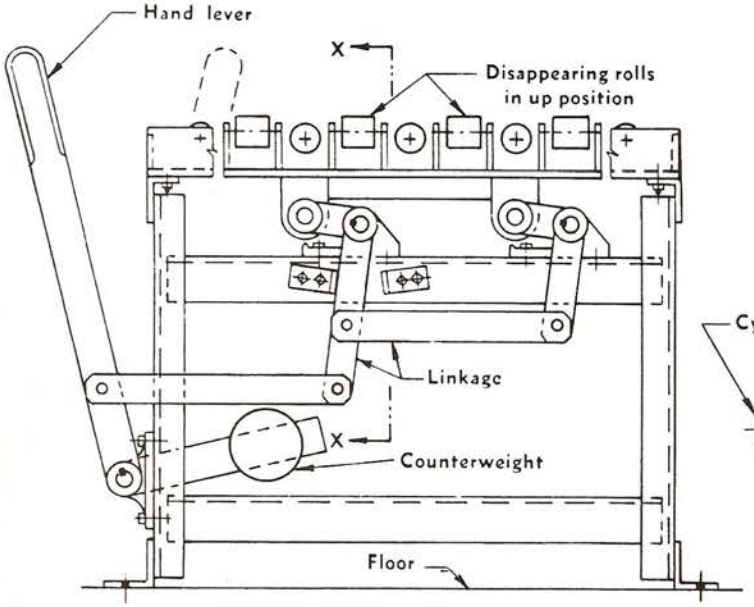
Ball Pedestals are particularly adapted to handling sheets or plates around shears and punch presses or other machines. The ball units permit turning or moving the plates in any direction and the pedestal construction provides a means of conveying without blocking the working area. See installation on page 56.





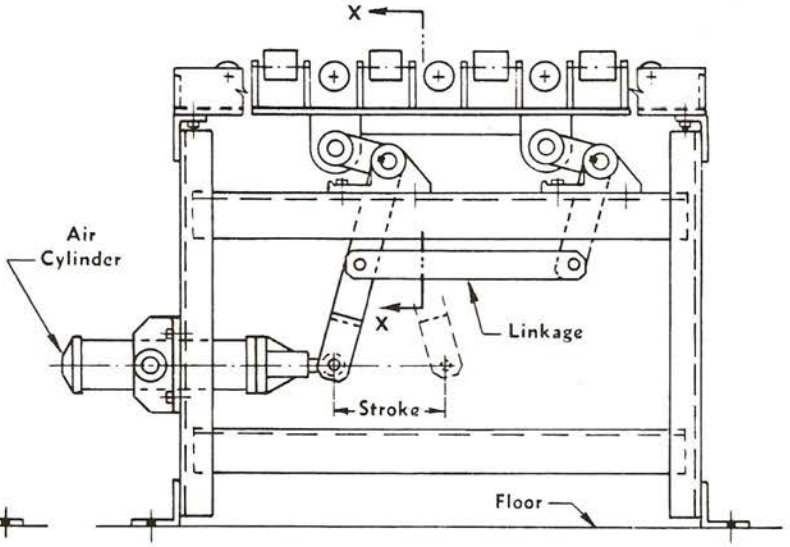
PLAN



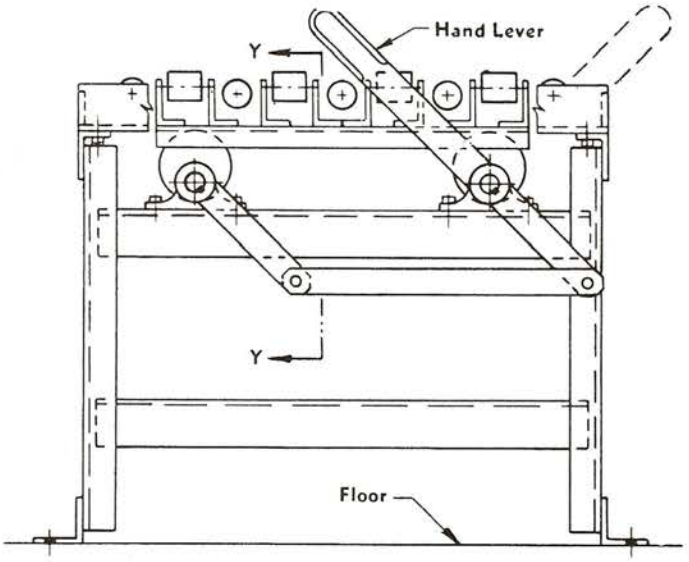


LINKAGE OPERATED–MANUAL

Either hand or foot lever

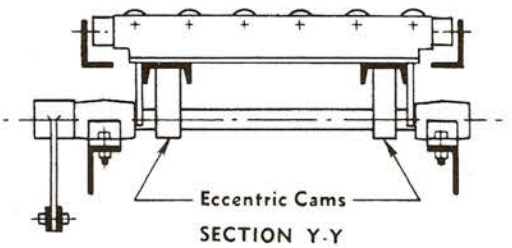


LINKAGE OPERATED–POWER



CAM OPERATED–MANUAL

Hand lever only



SECTION Y-Y

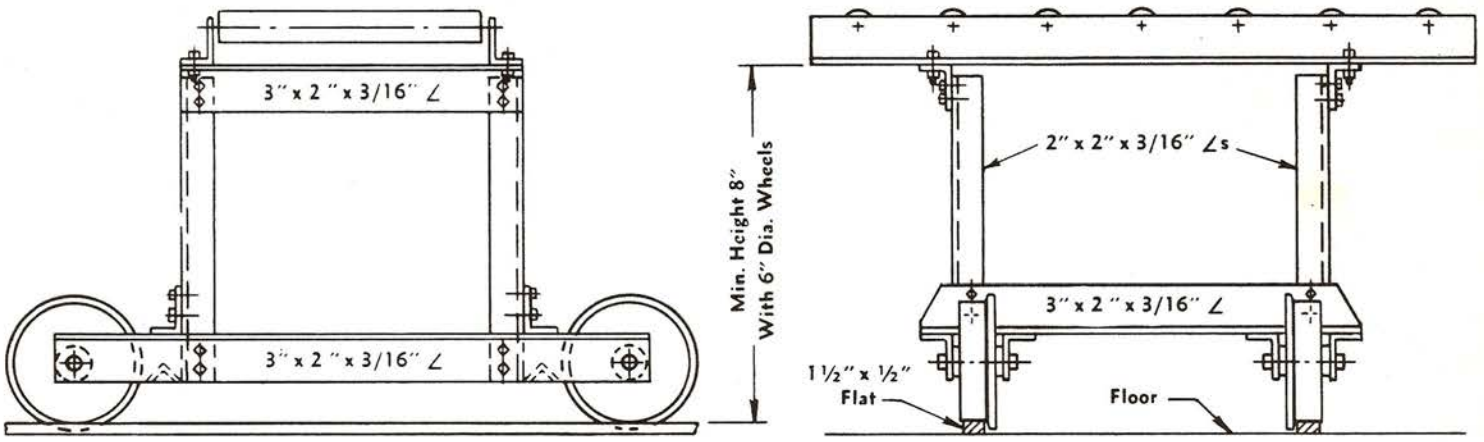
NOTES

Disappearing Roll Sections are designed for transferring packages at right angles without turning them.

The Linkage Operated type have disappearing rolls in normally down position and load is lifted in making transfer. For Manual operation either hand or foot lever can be used.

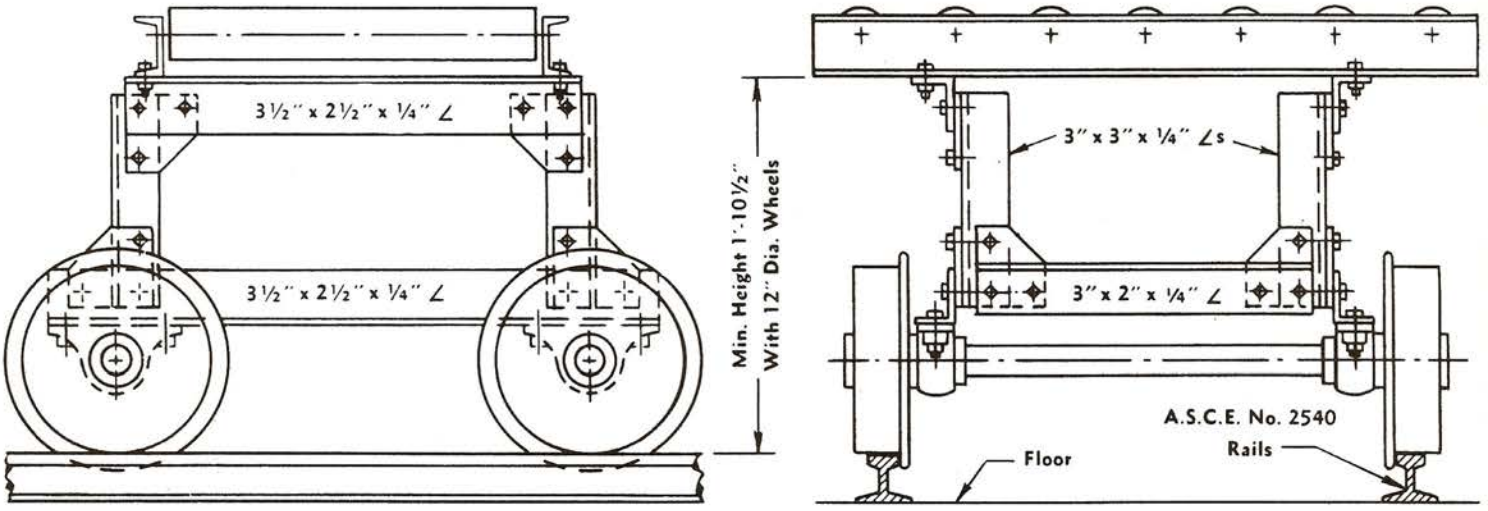
With Cam Operated type the disappearing rolls are locked in either up or down position. Consequently this type is recommended where travel is in both directions.

Power operation by Air Cylinder is optional with either type. In some cases wheels are used in place of rolls in the disappearing section to permit closer roll spacing in main line.



LIGHT DUTY TYPE — CAP. 500 LBS.

Wheels 6" or 8" Diameter with Needle Bearings
Mounted on ¾" Diameter Steel Shafts.



HEAVY DUTY TYPE — CAP. 2500-5000 LBS.

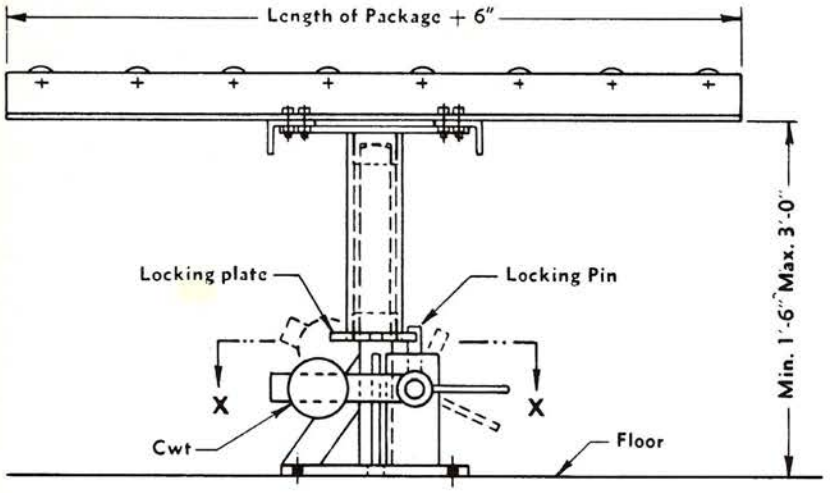
For max. cap. 2500 pounds use 8" or 10" diameter wheels with 1-7/16" diameter axles and roller bearing pillow blocks.

For max. cap. 5000 pounds use 10" or 12" diameter wheels with 1-15/16" diameter axles and roller bearing pillow blocks.

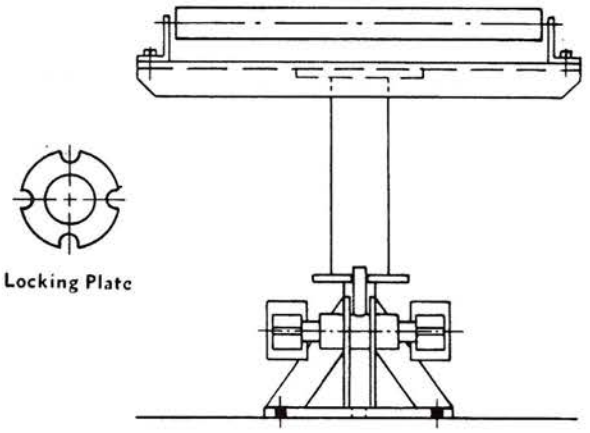
GENERAL

Transfer Cars are ordinarily used for transferring packages laterally from one line to another. The bed of car usually consists of a section of roller conveyor. Power driven beds or special features such as brakes, bumpers, push handles can be furnished as required.

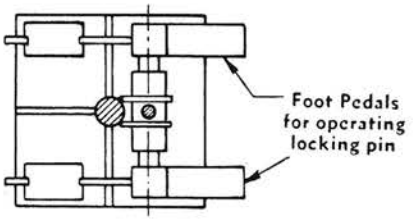
Power Propelled Transfer Cars are also available to meet special conditions.



ELEVATION



END VIEW

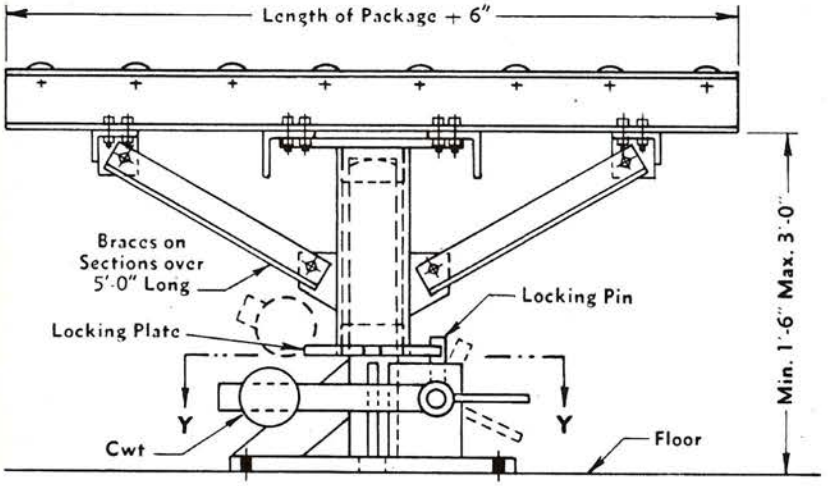


SECTION X-X

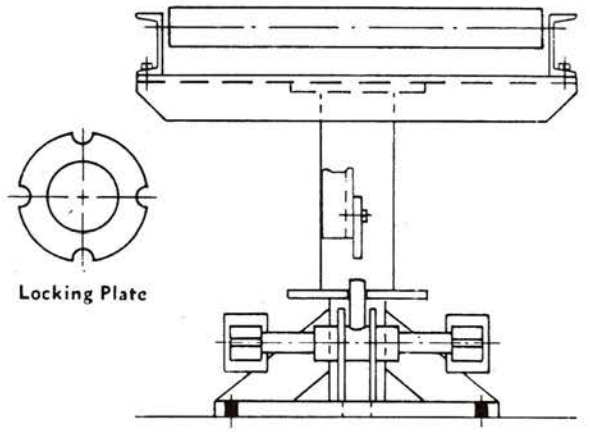
LIGHT DUTY TYPE — CAP. 500 LBS.

Table revolves on a 1-15/16" dia. cold rolled steel shaft with a 3½" O. D. 5/16" wall tubing sleeve having cold rolled steel bushings at top and bottom.

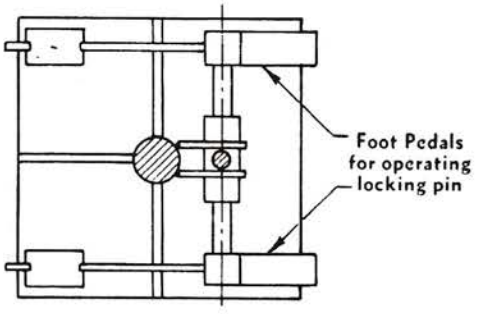
Foot-operated locking device is optional and stop positions on locking plate can be altered to suit conditions.



ELEVATION



END VIEW



SECTION Y-Y

MEDIUM DUTY TYPE—CAP. 1500 LBS.

Table revolves on a 2-15/16" dia. cold rolled steel shaft with a 4¼" O. D. ½" wall tubing sleeve having cold rolled steel bushings at top and bottom.

Foot-operated locking device is optional and stop positions on locking plate can be altered to suit conditions.

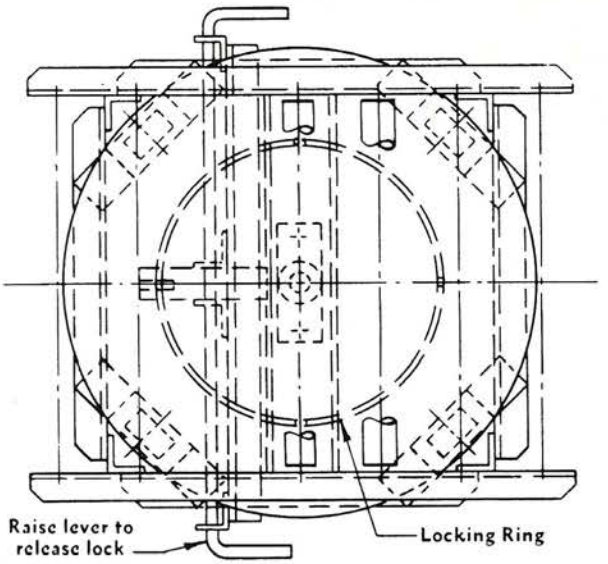
INVERTED CASTER TYPE TURNTABLE

MAX. LOAD 1000 LBS.

Ordinarily used where elevation will not permit use of Pedestal Type shown on page 64. The table top is mounted on a circular steel plate track and revolves on four 3" dia.-1¼" face rigid casters. Inverted position of casters eliminates possible accumulation of dirt or other foreign matter on trackway.

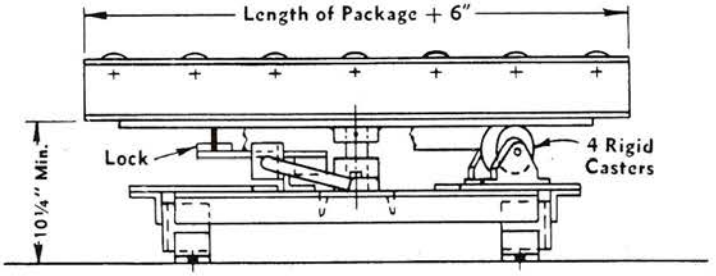
Locking device is optional and stop positions on locking ring can be altered to suit conditions.

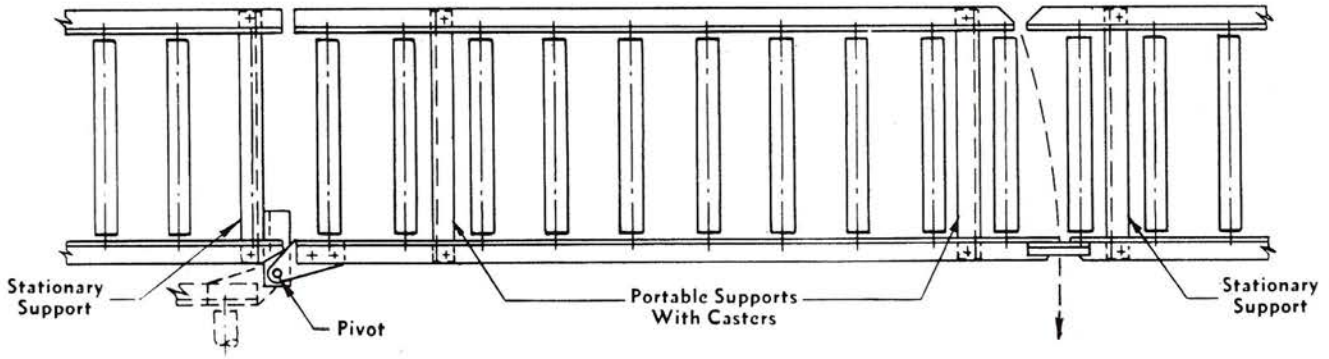
Capacity can be increased as required by use of heavier casters.

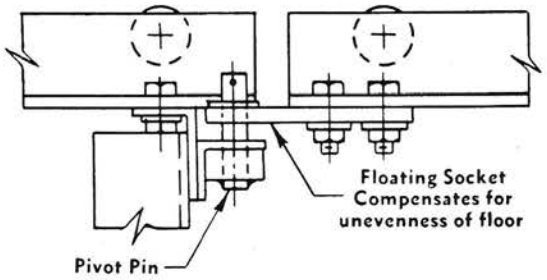


GENERAL

Turn Tables are used for transferring to lines at right angles without lifting packages from the conveyor. Also frequently used in assembly, finishing or crating operations to allow operator easy access to all sides without any lifting or dragging.





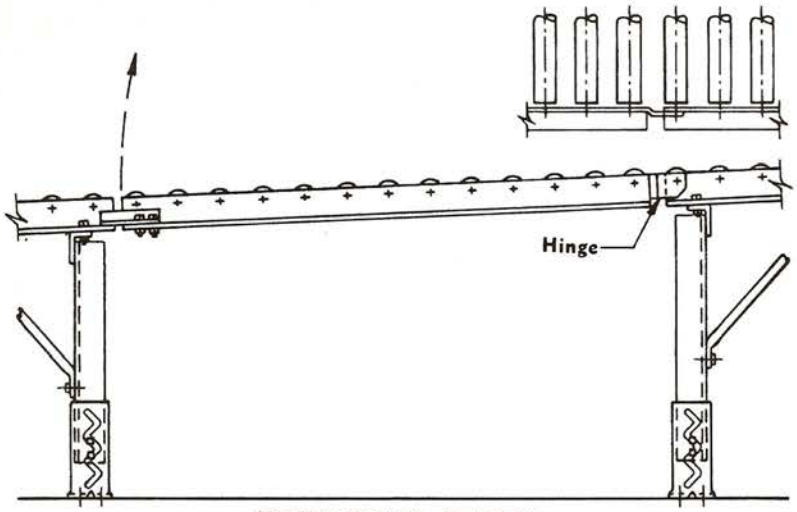


PIVOT DETAIL

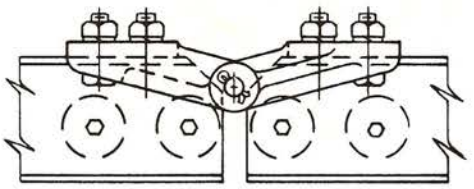
HORIZONTAL GATE SECTION

Horizontal Gate Sections are used to allow passageway through conveyor. Particularly desirable for wide aïsleways where overhead structure will not permit use of cable counterweighted hinge sections.

The gate section is pivoted at one corner and mounted on ordinary portable supports with casters. Sometimes furnished with floor tracks to prevent casters from wearing grooves in concrete.

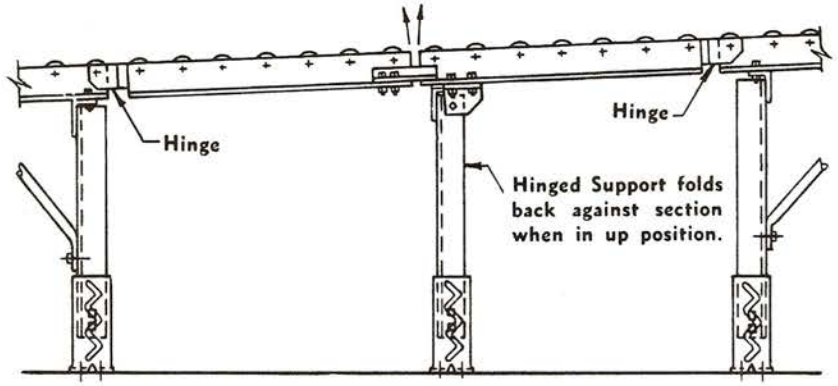


SINGLE HINGED SECTION
Not Counterweighted

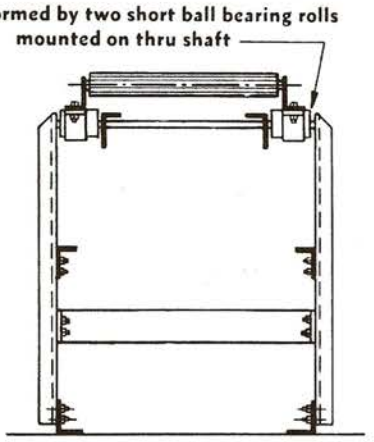


No. 152 C. I. HINGE
For Channel Frames

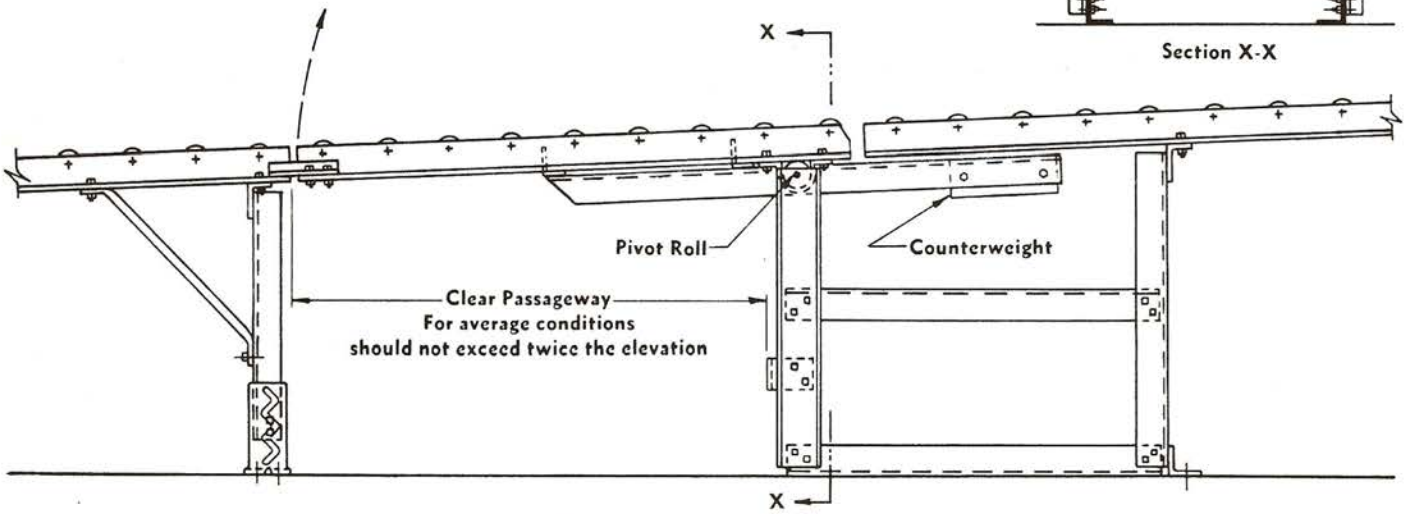
No. 151 C. I. HINGE
For Angle Frames



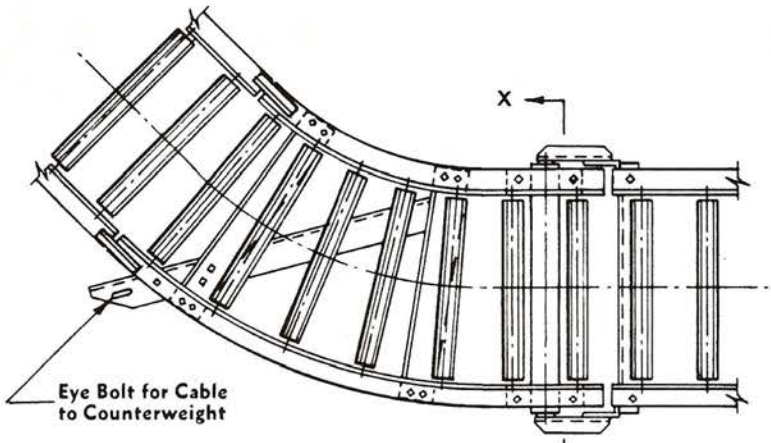
DOUBLE HINGED SECTION
Not Counterweighted

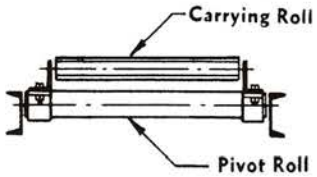


Section X-X

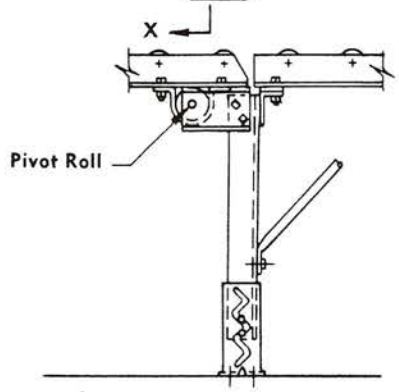


ARM TYPE HINGED SECTION
Counterweighted

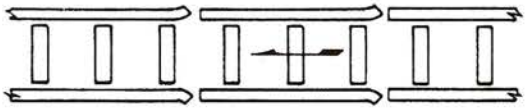




Section X-X

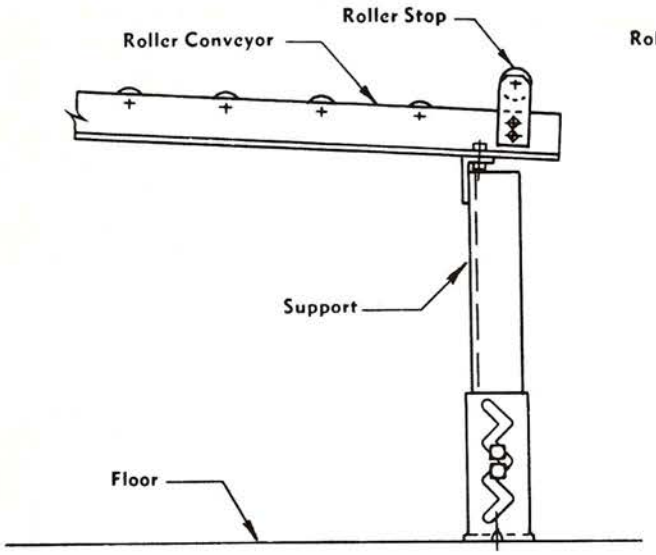


CABLE TYPE HINGED CURVE
Counterweighted



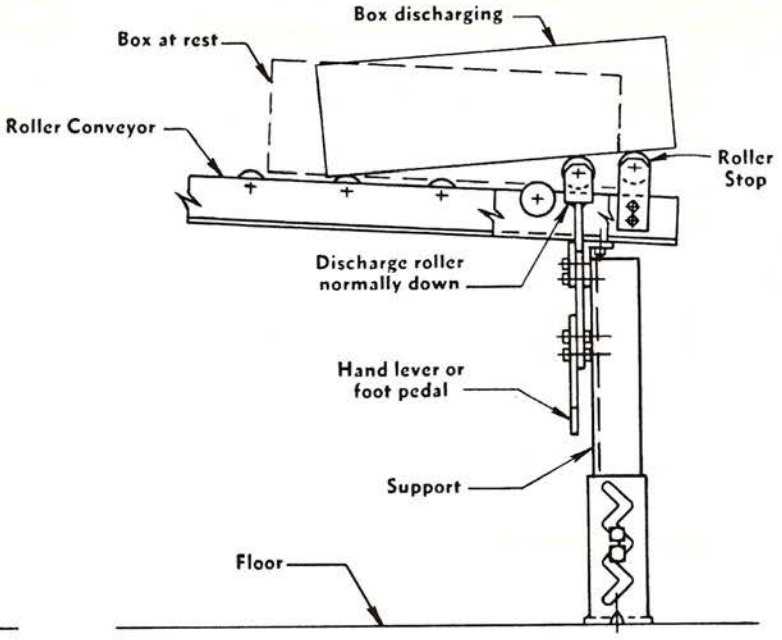
Where Guard Rails are necessary,
they are usually flared like this.

CABLE TYPE HINGED SECTION
Counterweighted



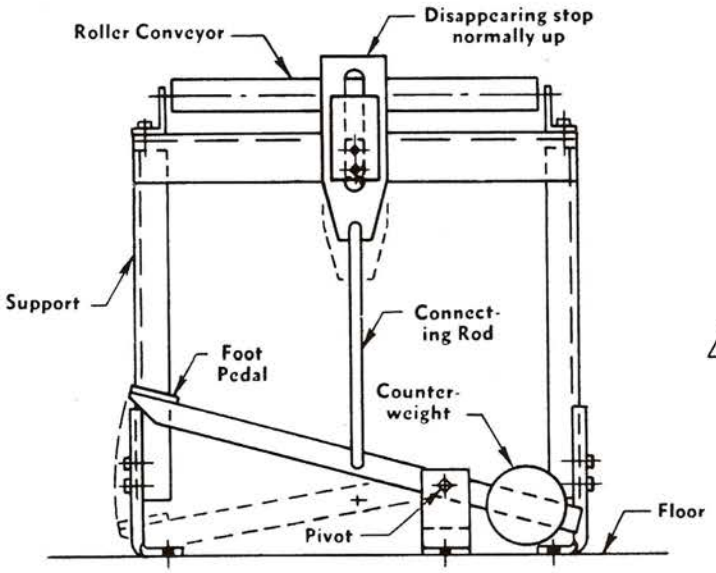
STATIONARY ROLLER STOP

This type of stop is designed for use at discharge end of roller conveyor lines. Center line of stop roller is usually about 1" above top of rolls in conveyor line. End of box is lifted manually for discharging over roller stop. Suitable for use with light packages.



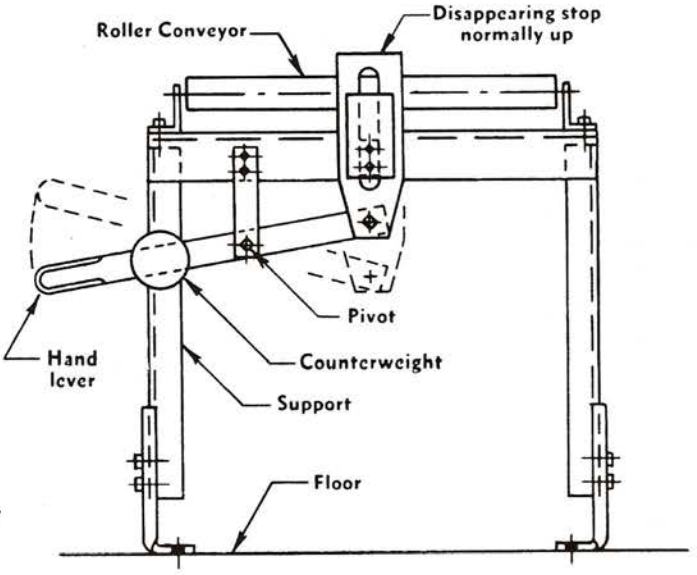
ROLLER STOP WITH LEVER DISCHARGE

Used in connection with roller gravity storage lines where end box is under pressure. The end box is released by raising the discharge roller, permitting box to escape over the roller stop. After box is raised, the discharge roller is lowered, permitting remaining boxes to advance to roller stop.



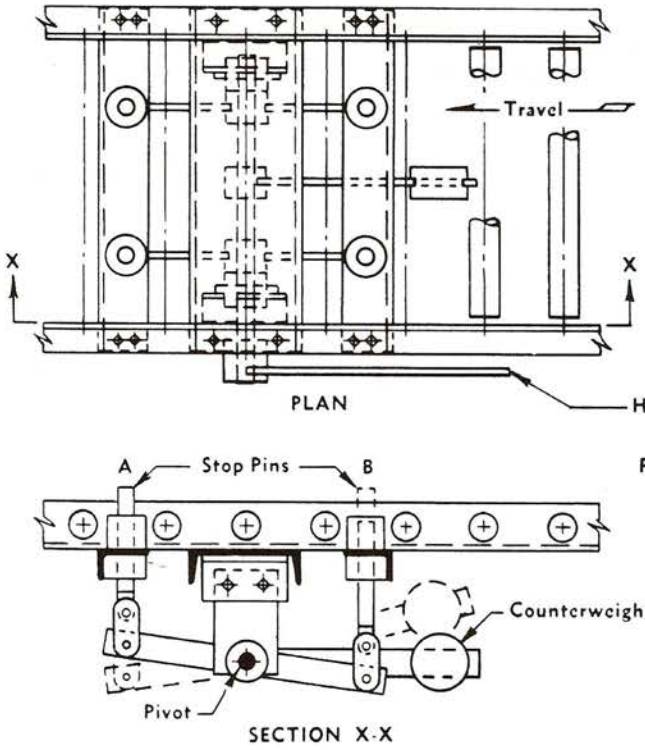
FOOT LEVER STOP

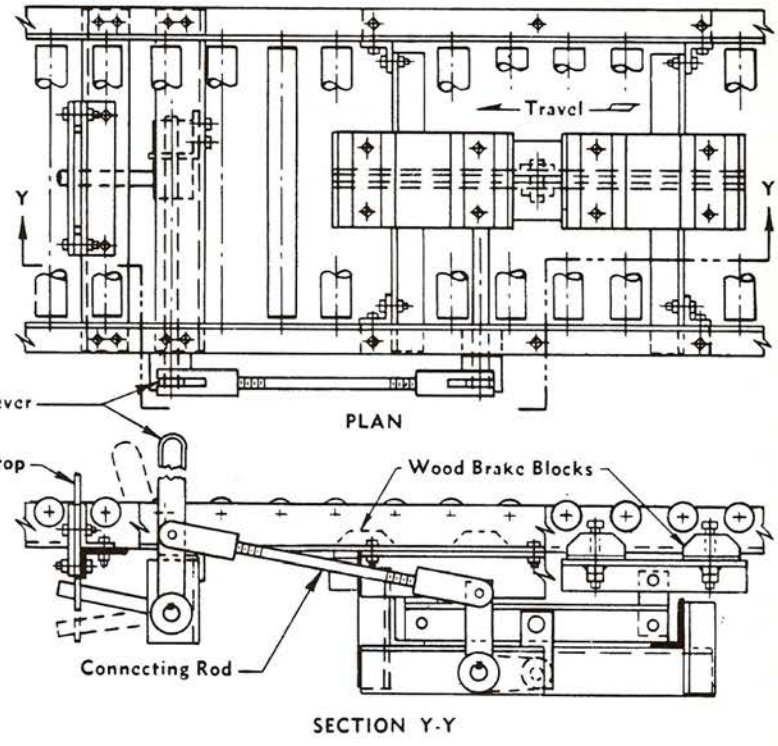
The Foot Lever Stop is used for stopping packages at intermediate points along roller conveyor line. Also at ends of lines feeding onto switch sections, transfer cars, etc. Stop is counterweighted to hold it in normally-up position and lowered by foot pedal for releasing package.



HAND LEVER STOP

The Hand Lever Stop is similar in operation and use to the Foot Lever style. When used in connection with transfer cars, etc., the hand lever is sometimes replaced with an arrangement which lowers stop automatically as car is pushd into position for receiving package.



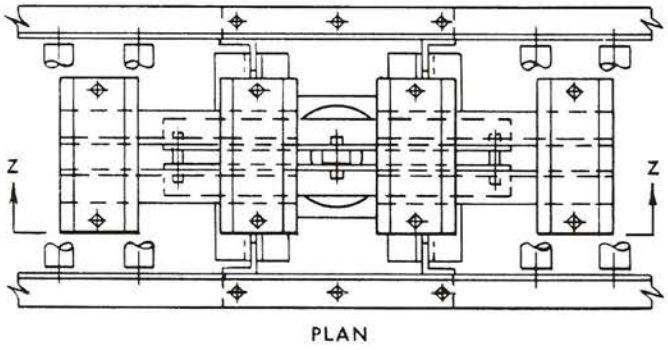


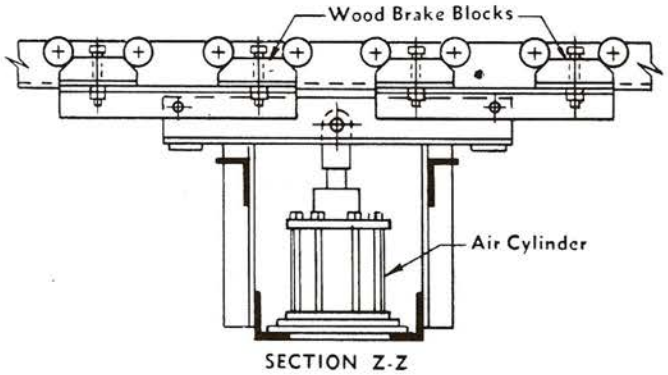
PIN TYPE ESCAPEMENT

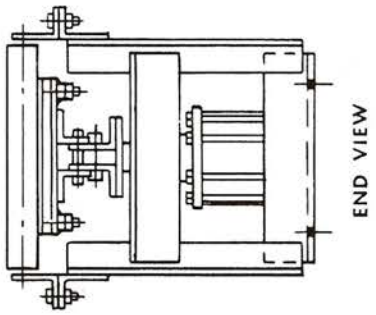
Designed for use with drums or other cylindrical objects. Also suitable for bevelled pans or packages which insure a gap between packages for pins to operate. Drums or packages must be of uniform size. Pins "A" are normally-up to form a stop. As these are lowered by hand lever, pins "B" automatically raise to hold back line, allowing end package to escape.

BRAKE AND PLATE ESCAPEMENT

Used where there is no space between packages. Also where there is some variation in length provided space between plate stop and nearest brake block is not less than longest package or more than 1 ½ times shortest package. Plate stop is normally up and as stop is lowered the brake blocks are automatically raised to hold rolls, allowing end package to escape.

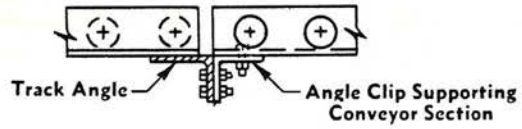






BRAKE SECTION

The brake blocks are made of bevelled hard wood. These are mounted on a heavy steel link mechanism and are forced up between the rolls, positively locking them against rotation. Pivoted mounting permits self-equalizing action. May be operated by air or hydraulic cylinder, by electric thruster, or by hand lever as with Brake and Plate Escapement shown above. Used for stopping lines of packages. When desired to release one package at a time, two adjacent sets of brakes can be used. As the first set is released to allow end packages to move on, the second set holds back balance of line. This arrangement is recommended where at times the conveyor is used as a thru line without stopping packages.



SECTION X-X

FORMULA FOR SWITCH

$\text{Tan } A = \frac{E}{C}$

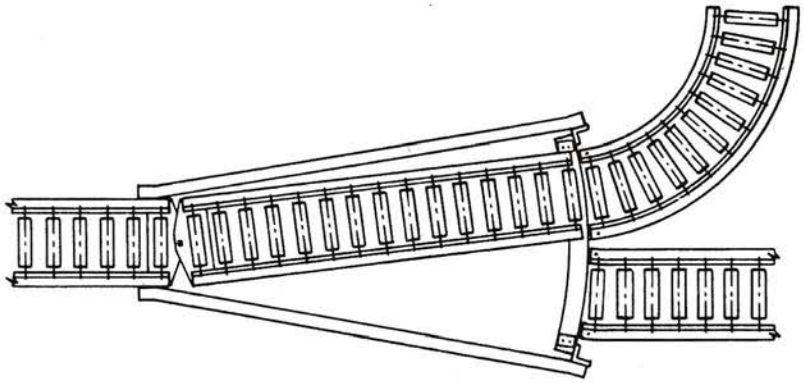
$B = 2A$

$E = \frac{1}{2}$ O. A. Width of Conveyor

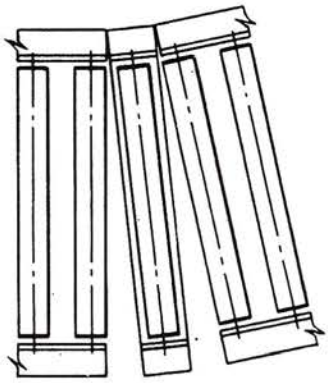
$R = \sqrt{C^2 + D^2}$

$D = \frac{1}{2}$ Frame Width

THREE WAY SWITCH SECTION



TWO WAY SWITCH SECTION



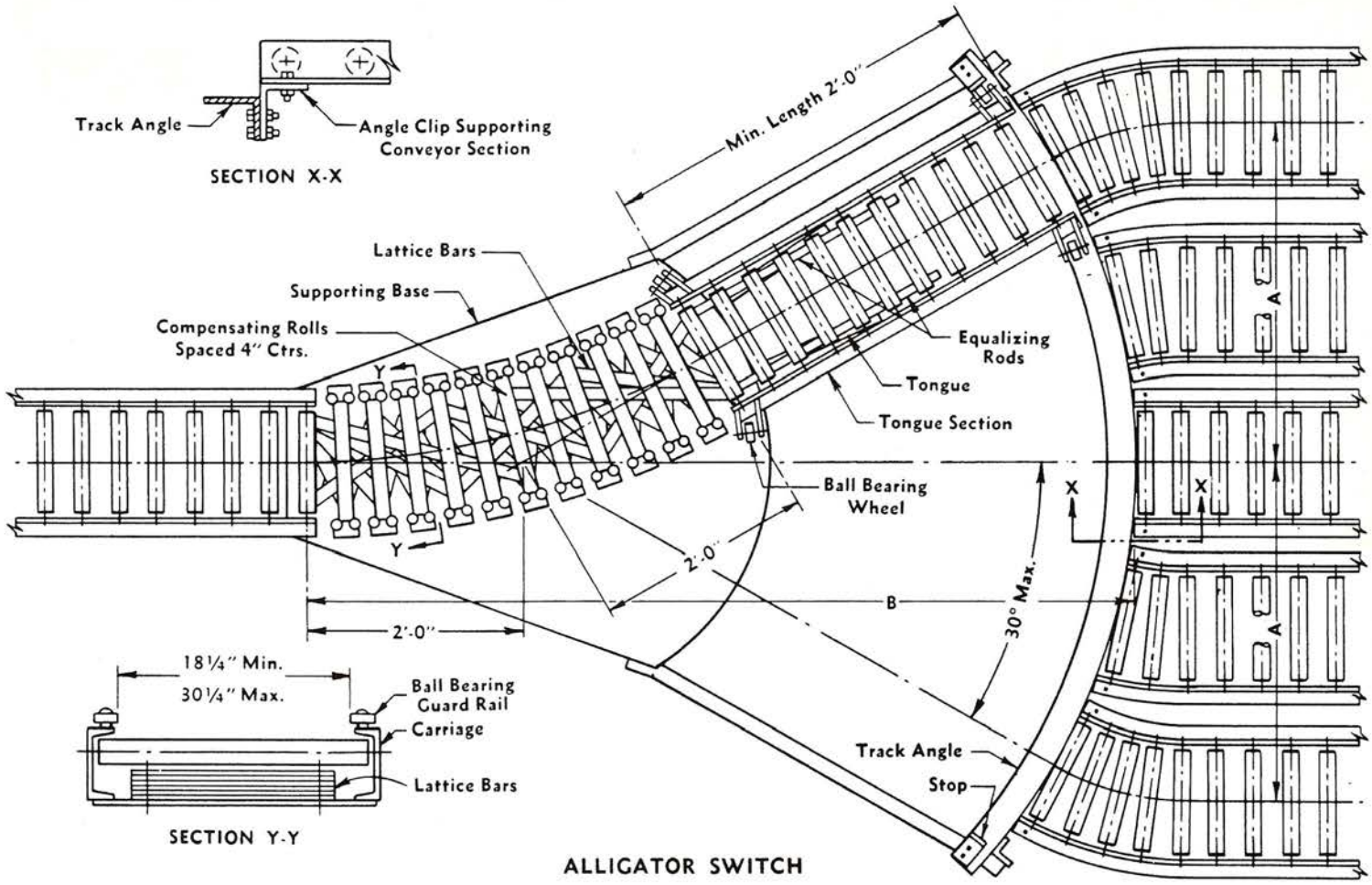
COMPENSATING ROLL

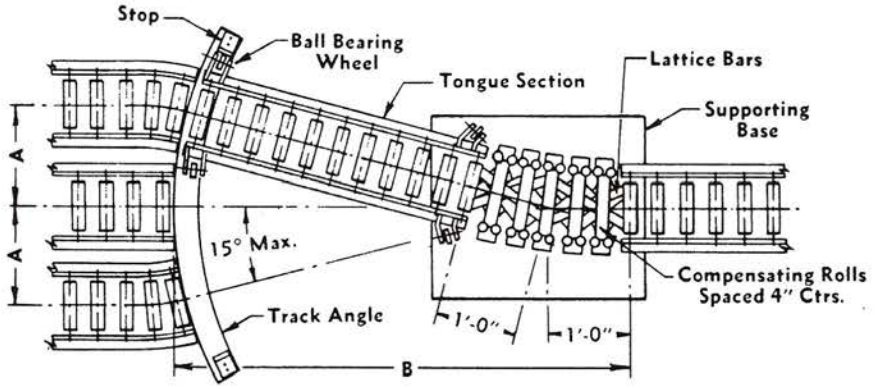
GENERAL NOTES

Pivoted Type Switches are normally 10'-0" long and are usually satisfactory where packages are long enough to span gap at pivot joint.

These sections are usually manually operated. Overhead switches are equipped with operating cables, also used for remote control. The moving end of switch can be mounted on ball bearing wheels for easier operation and can be power operated if desired.

On two-way switches the compensating roll arrangement shown above can be used to partially close gap. Where gap at pivot joint is too great for packages handled, or where maximum smoothness of operation is important, the Alligator Type Switch shown on page 71 should be used.





FORMULA FOR SWITCH

Alligator

$B = (1.732 \times A) + 2'\text{-}0''$

Semi-Alligator

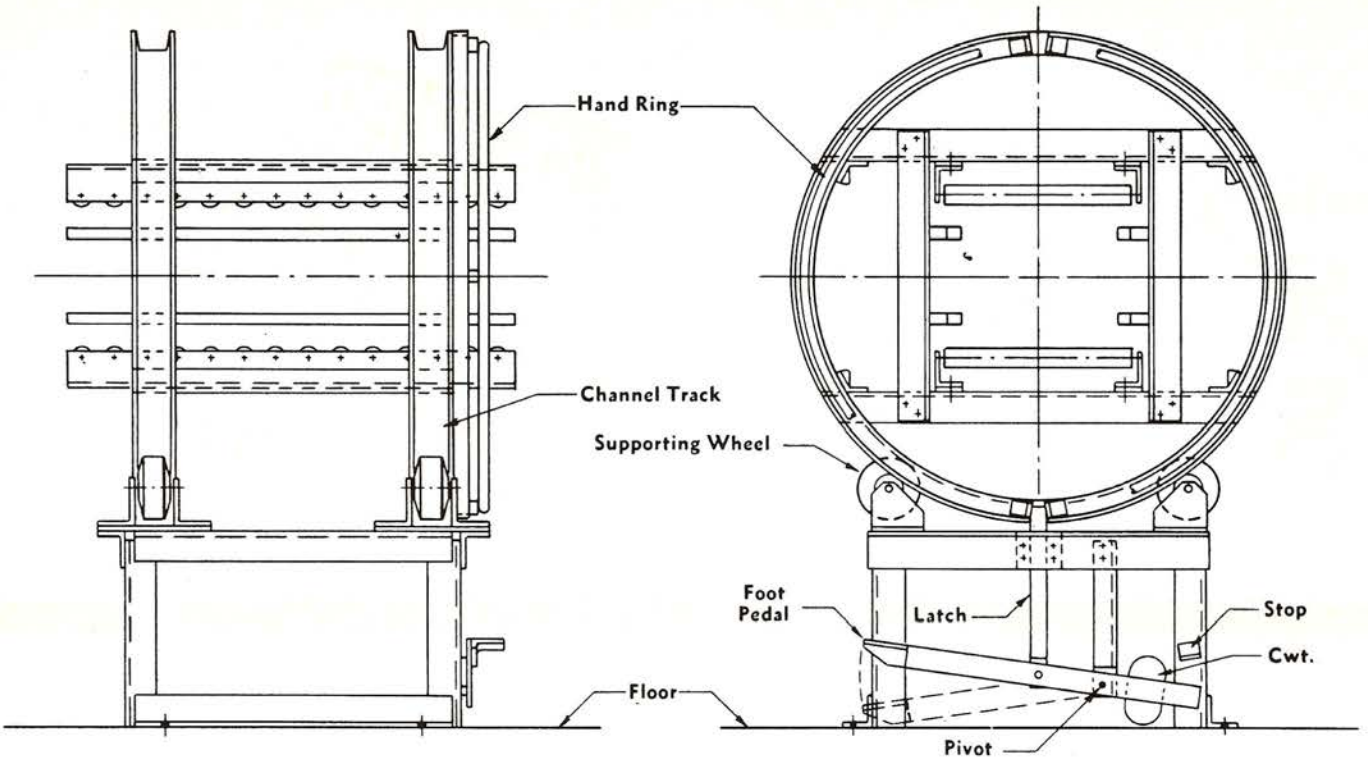
$B = (3.733 \times A) + 1'\text{-}0''$

GENERAL NOTES

The Logan Alligator Switch is designed primarily for use where more than three lines are to be served. The Semi-Alligator Type serves either two or three lines where, due to unfavorable conditions, the Pivoted Type shown on Page 70 would be unsuitable. There is no gap at pivot point and packages remain in the same relative position while traveling over switch. This is particularly desirable for small packages and for wide conveyors.

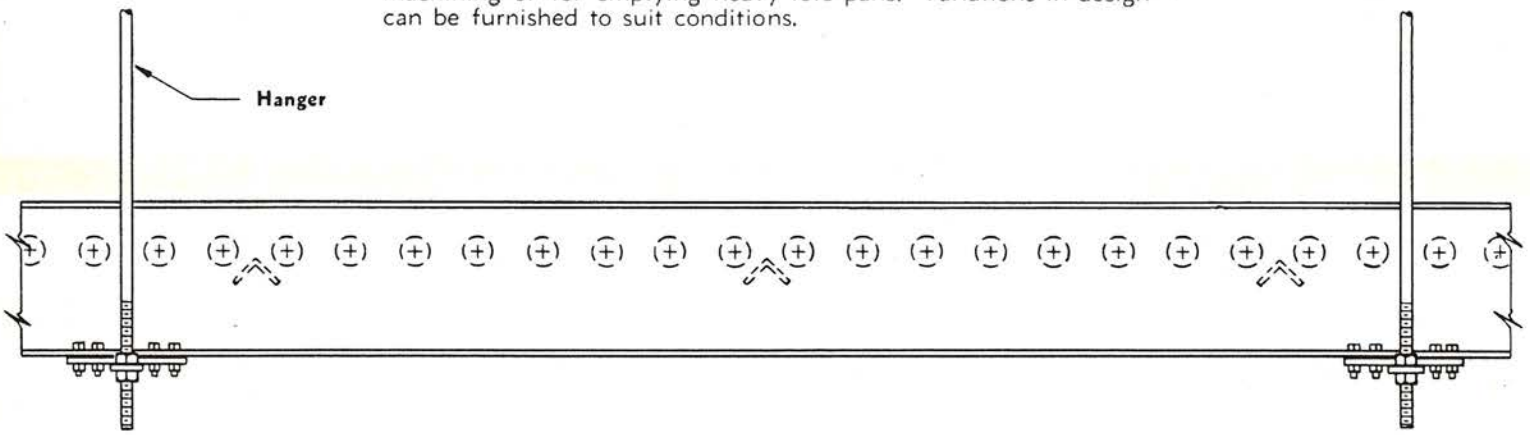
The compensating rolls are mounted in individual carriages free to slide over a supporting base. Carriages are tied together by a multiple pantograph arrangement of lattice bars, one end of the bar arrangement being anchored to the supporting base and the other end to a movable tongue section. Tongue section may be moved manually or by power. This movement is transmitted through the lattice bars in such a manner that the compensating rolls are automatically kept radial and in proper alignment with one another at all times.

Power units can be equipped with remote controls or automatic selective controls operated by the packages.



ROLL-OVER UNIT

The Logan Roll-over Unit consists essentially of a circular framework carrying Roller Conveyor sections and mounted on wheels. The load is revolved manually around its center of gravity with very little effort. Used for rotating through 90° arc or completely inverting at 180°. Particularly designed for positioning heavy castings for machining or for emptying heavy tote pans. Variations in design can be furnished to suit conditions.



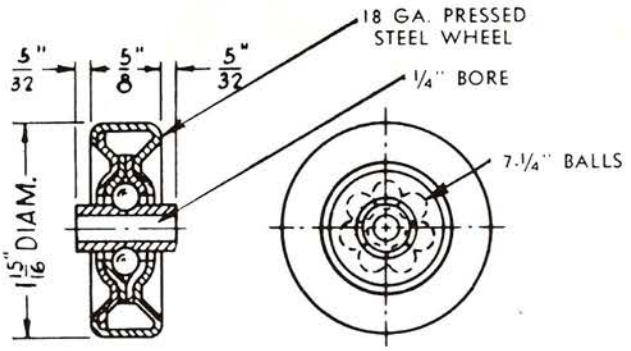
CAPACITY		
Length of Span	Size of Channels	
	10"-8.4#	12"-10.6#
16'-0"	6000#	8500#
18'-0"	5140#	7570#
20'-0"	4170#	6820#
25'-0"	2670#	4600#

STAIR CHANNEL SECTIONS

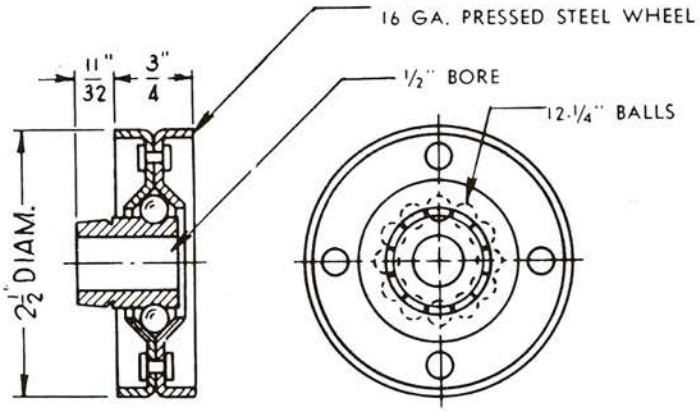
Stair Channel Sections are used where it is necessary to space supports or hangers too far apart for use of regular frames. Such as conveyor suspended from roof trusses or outdoor conveyor on piers.

The capacities shown at left are the total safe loads (uniformly distributed) in pounds for the spans listed. The ratings given do not allow for the weight of the rolls, so in determining the allowable live load for each span, the total weight of the rolls must be deducted. See table on page 50 for approximate roller weights.

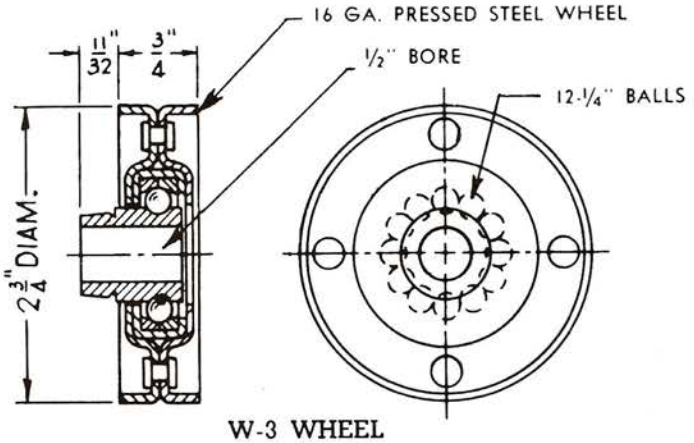
WHEEL CONVEYOR DETAILS



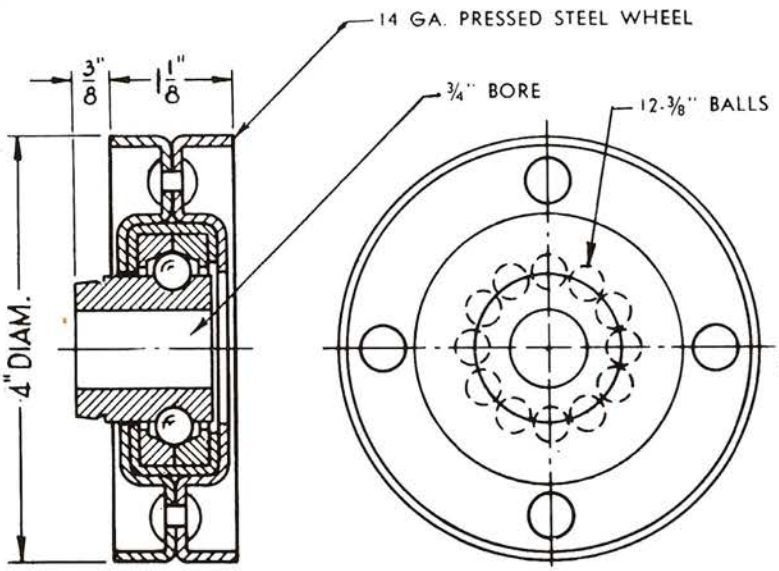
RS WHEEL
Cap. 25 Lbs.



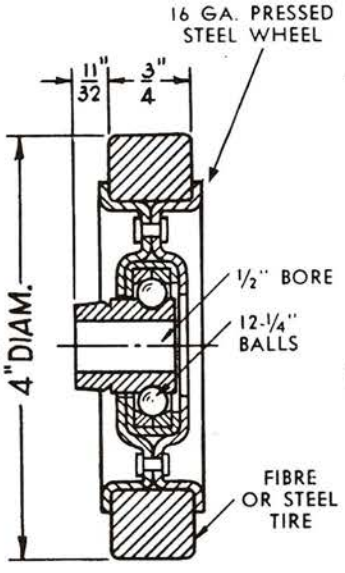
W-2 WHEEL
Cap. 50 Lbs.



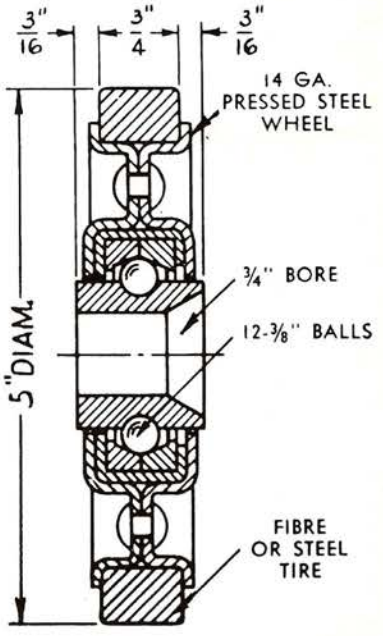
W-3 WHEEL
Cap. 125 Lbs.



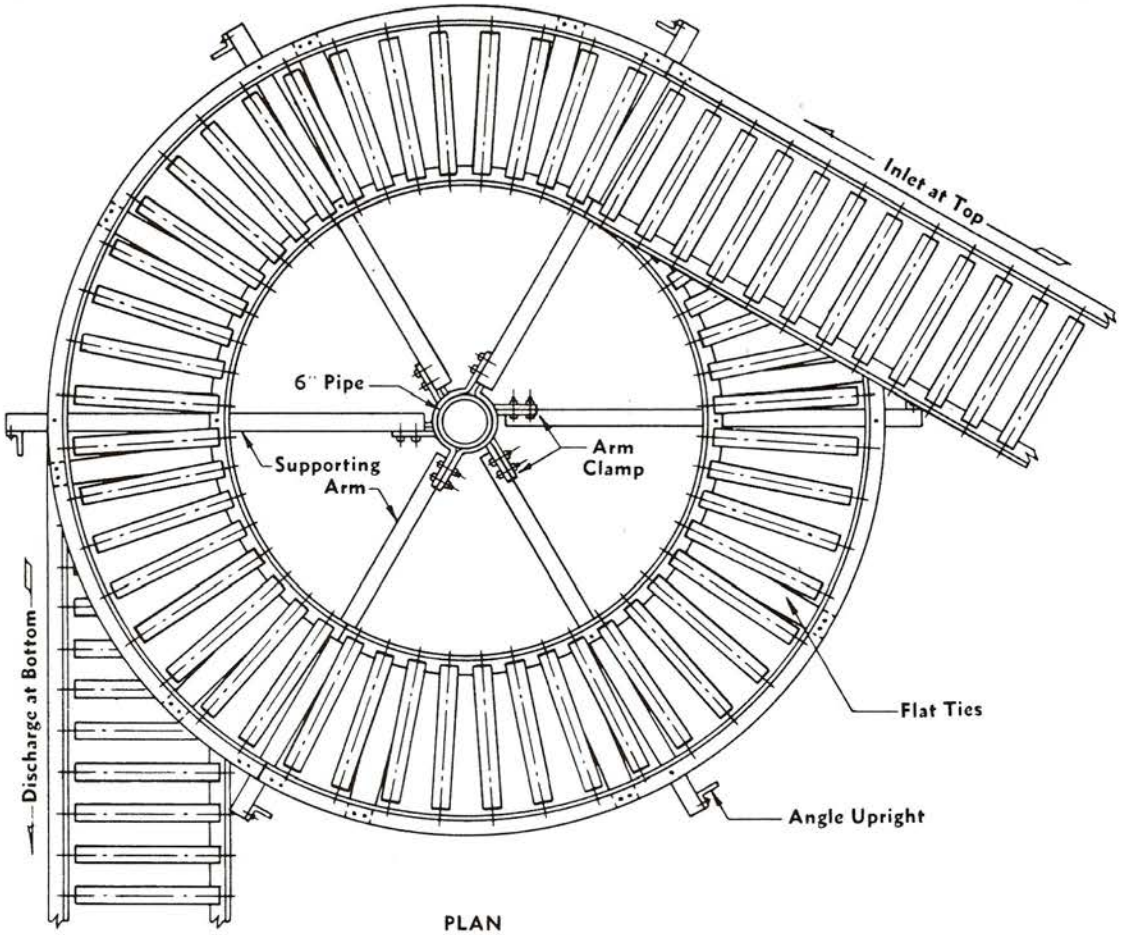
W-4 WHEEL
Cap. 325 Lbs.



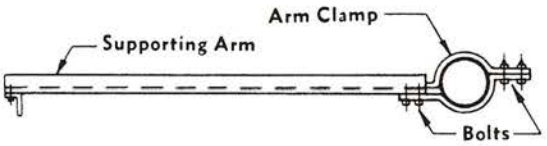
W-8 WHEEL
Cap. 125 Lbs.



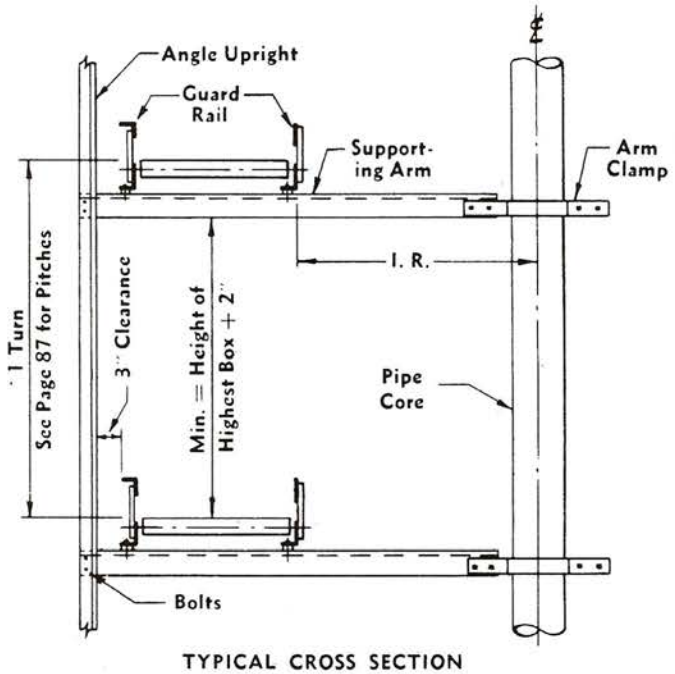
W-6 WHEEL
Cap. 325 Lbs.



PLAN
Guard Rail Not Shown



CONSTRUCTION OF SUPPORTING ARMS



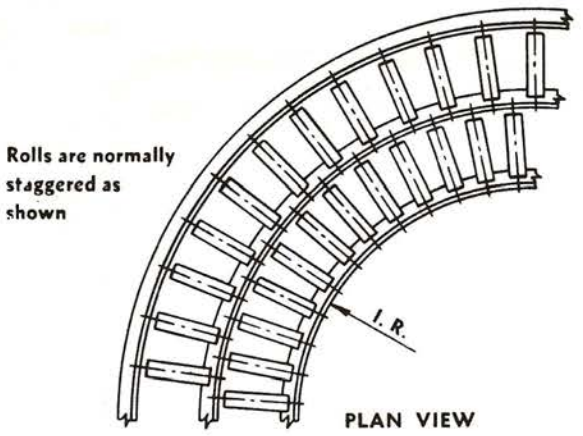
TYPICAL CROSS SECTION

NOTES

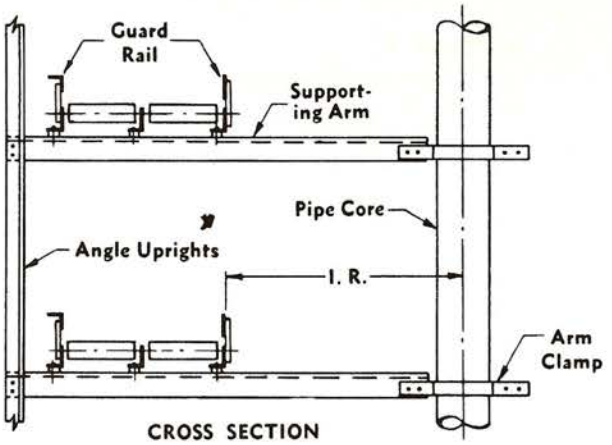
Each complete turn of spiral is built in two sections of 180° each.

All Single Roller Spirals are equipped with triple hole punching on outside frame member to permit field adjustment under actual operating conditions (see Page 48). If there is considerable variation in size of packages, a differential Roller Spiral is recommended (see Page 86).

See Roller Spiral Notes Page 88.



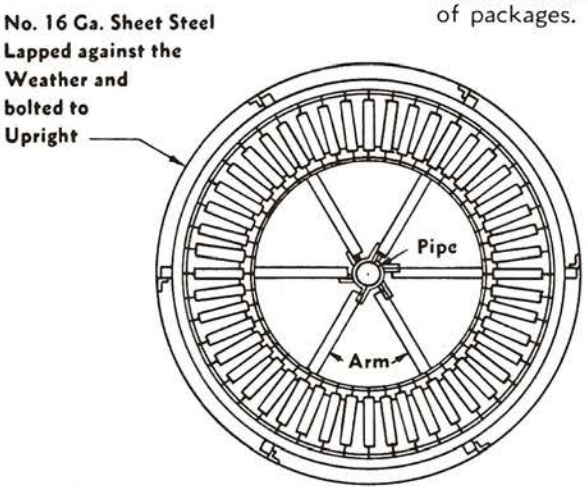
PLAN VIEW



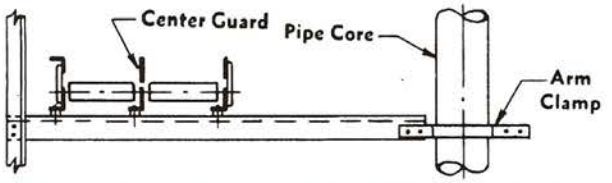
CROSS SECTION

DIFFERENTIAL ROLLER SPIRAL

Recommended where there is a wide variation in size of packages. Also when spiral is used for storage.

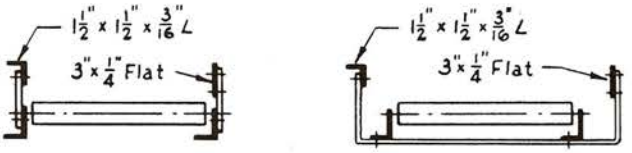


CIRCULAR SHEET STEEL ENCLOSURE



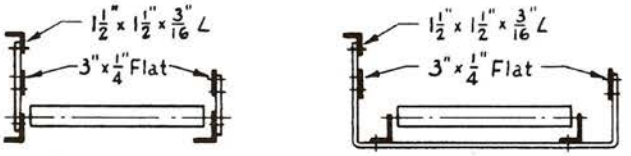
DOUBLE LANE SPIRAL WITH CENTER GUARD

Used when two lines of packages must be kept separate.



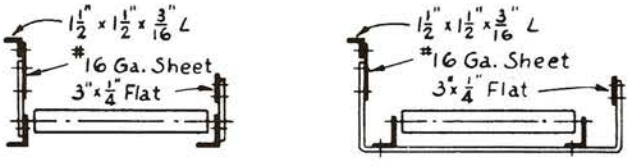
Type A Type B

STANDARD GUARD RAIL



Type C Type D

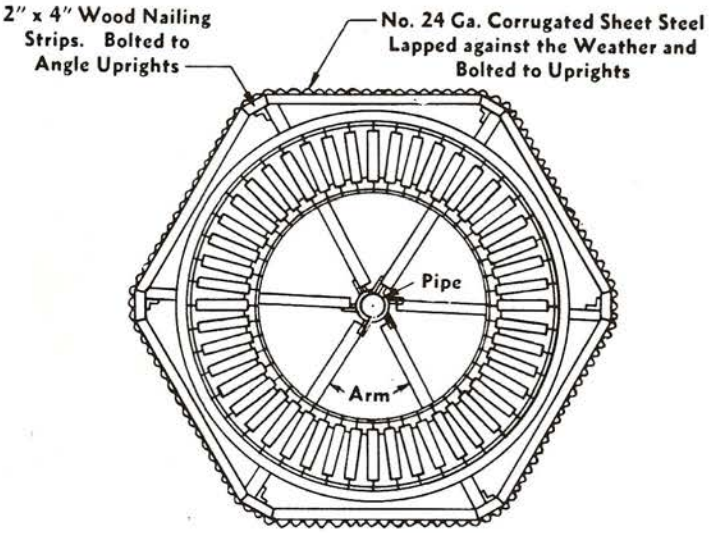
DOUBLE GUARD RAIL



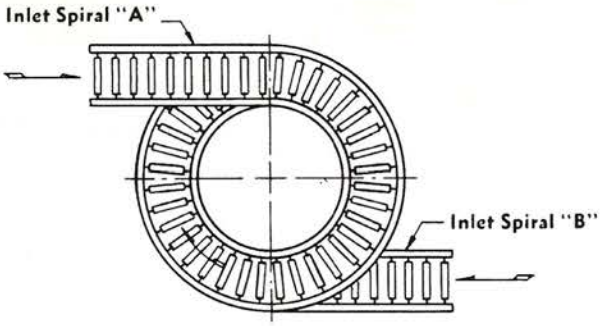
Type E Type F

SHEET STEEL GUARD RAIL

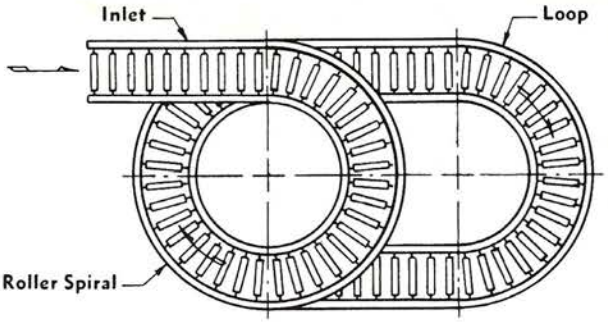
Used where there is wide variation in heights of packages handled—for packages with projections on the sides—for cartons and packages with weak sides, especially when the spiral is used for storage. Usually made higher than the highest package.



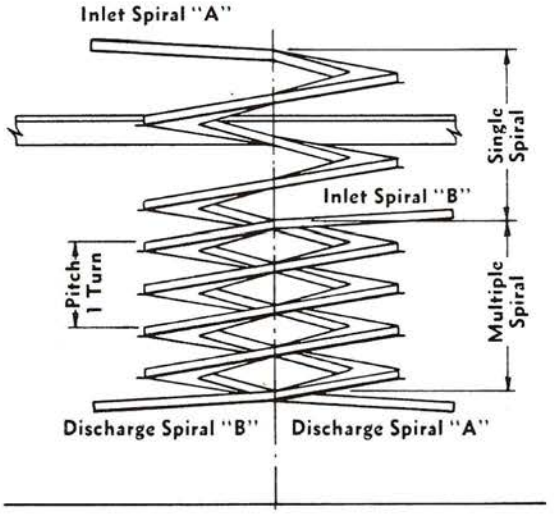
CORRUGATED SHEET ENCLOSURE



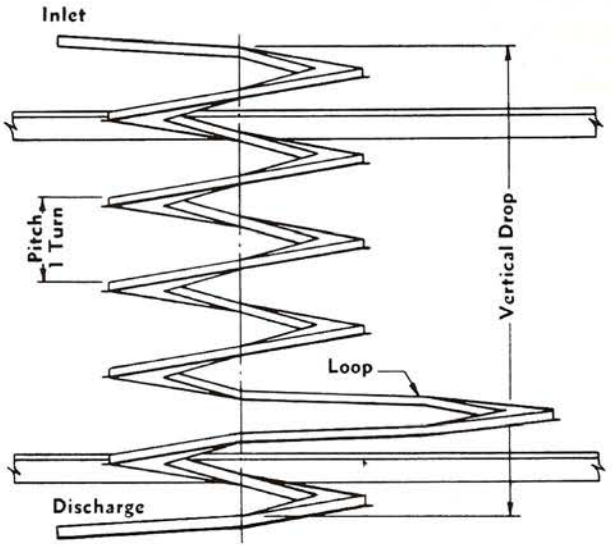
PLAN
Multiple Spiral



PLAN
Roller Spiral Loop
For Manual Loading and Unloading

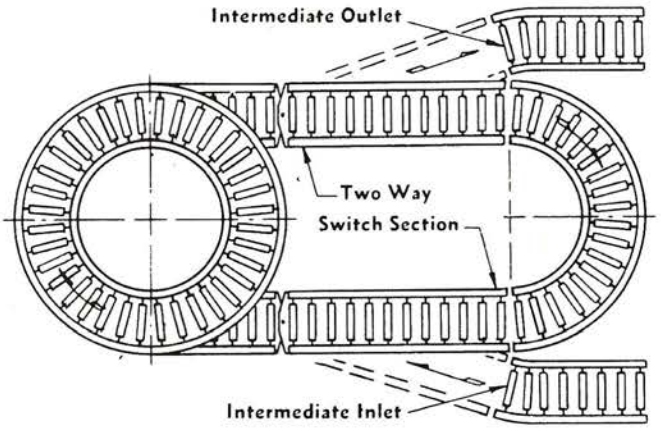


ELEVATION
Multiple Spiral



ELEVATION
Showing Roller Spiral Loop

Roll Length	Normal Pitch For Average Packages	Dia. of Floor Openings For 2'-6" I. R. Spirals	Dia. of Floor Openings For 3'-0" I. R. Spirals
12"	2'-1" to 2'-9"	8'-4"	9'-4"
14"	2'-2" to 2'-10½"	8'-8"	9'-8"
16"	2'-3" to 3'-0"	9'-0"	10'-0"
18"	2'-4½" to 3'-1½"	9'-4"	10'-4"
20"	2'-6" to 3'-3"	9'-8"	10'-8"
24"	2'-8" to 3'-6"	10'-4"	11'-4"
30"	2'-11" to 3'-11"	11'-4"	12'-4"



PLAN
Roller Spiral Loop
With Intermediate Inlet and Outlet

Adjustable Lead

All single roll spirals have triple hole punching for shafts on outside frame member to adjust lead. (See Page 48). Not necessary with differential or tapered roll spirals. Logan Adjustable Lead is recommended where especially fine adjustment of lead is desired. These features allow adjustment of lead in field to meet actual operating conditions.

Bearings

Ball bearings are normally used on roller spirals. Sometimes, when necessary to use a steep pitch for a heavy package, bronze bearings are substituted to reduce liveliness of rolls.

Brakes

It is rarely advisable to use brakes of any type on roller spirals, as it is difficult to get 100% operating efficiency.

Differential Rolls

Differential roller spirals are recommended where there is a wide variation in size of packages to be handled and where some of them might turn around and jam between the guard rails. They are always recommended if spiral is to be used for storage. All differential roller spirals have center rails.

Enclosures

Roller spirals located outdoors are usually enclosed for protection against the weather. The enclosure may be a sheet steel cylinder bolted to the spiral framework; or a wood framing may be bolted to the spiral uprights and corrugated sheets nailed to this framing to form a hexagon shaped enclosure. The cylinder makes a neater job but usually costs a little more.

Either type enclosure can be equipped with fire doors at inlet and discharge points.

Hangers

Roller spirals can be hung from the ceiling as well as supported from the floor. In hanging from the ceiling, it is usually desirable to extend the center column to the floor and to cut off the angle uprights level with the bottom of spiral, hanging these uprights from the ceiling.

Loops—See Page 87

When necessary to deliver to, or discharge from, a roller spiral at some intermediate point, a loop is used where loading and unloading is done manually. Switch sections may be used in loop where packages are received from, and discharged to, auxiliary gravity lines.

Multiple Spirals—See Page 87

It is sometimes desirable to use double deck or even triple deck roller spirals in connection with two or three separate conveyor lines. In such cases, particular care must be taken that there is sufficient clearance for all packages and that the pitch does not become too steep.

Packages

The type, shape, size, and weight of packages handled must be carefully considered in determining the type of spiral to use and its limitations. If packages have handles or extensions on the ends, care must be taken that these do not interfere. If packages have tapered sides, the top must not extend over the guard rail far enough to interfere with any uprights or tie rods. It is always desirable to make the distance between guard rails such that no package handled can turn far enough to wedge itself between the guards. When the sizes of packages vary to the degree that making the guard rails far enough apart to handle the largest package permits the smaller packages to turn around, then the roller spacing must also accommodate these smaller packages handled crosswise.

Pitch—See Page 87

The pitch equals the vertical drop per turn. The number of turns is usually determined by the relative direction of inlet and discharge and the total vertical drop, remembering that the pitch should be held within the limits shown in table on Page 87. The type, shape, size, and weight of packages handled have a direct bearing on whether the pitch should be governed by the maximum or minimum limit.

Radius

The proper radius depends upon the pitch of roller spiral and upon the packages handled. 2'-6" and 3'-0" inside radii are standard. Ordinarily, 2'-6" inside radius is satisfactory for pitches up to 2'-9", and 3'-0" inside radius best for greater pitches.

Rolls

The type and length of rolls (or distance between guards) is determined, as for gravity curves, by the weight and size of packages handled. Any roller spiral will handle packages best when the rollers are spaced as close as possible. However, in actual practice, for economy the rollers are usually mounted so that the spacing on outside rail will be not more than one-third the length of shortest package. The greater the pitch for a given radius, the closer the rolls should be spaced for smooth operation.

All roll centers are taken at center of roll.

Storage

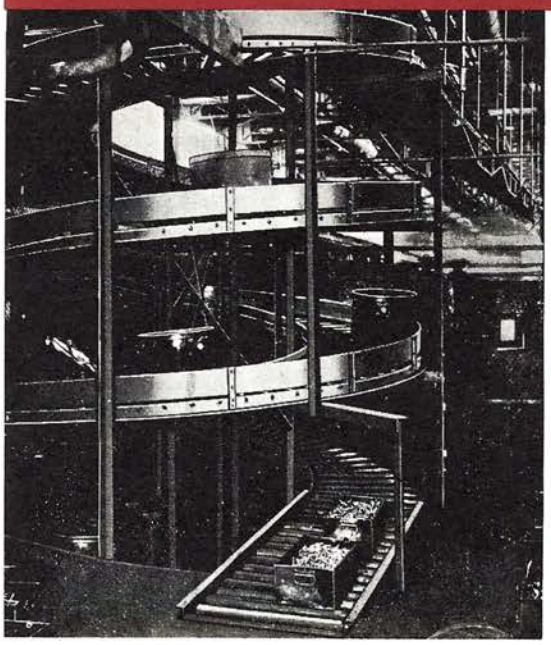
The use of roller spirals for storage should be avoided if possible and should never be attempted unless all packages are the same type and approximately the same size. When storage is desirable, the type of container and the weight of the maximum number of packages stored must be considered in determining whether or not it is practical.

Travel

On right hand spirals the package travels clockwise; on left hand spirals counter-clockwise.

ROLLER SPIRALS

ROLLER Spirals usually offer the most satisfactory means of lowering by gravity. Smooth operation at small pitch and comparatively slow speed of travel virtually eliminates possibility of breakage. This also permits handling tote pans or open top containers without spillage and handling on end of tall packages such as barrels. Roller Spirals frequently used for "live" storage.



ABOVE: A double Roller Spiral in large oil refinery. One track handles boxes of empty containers for lubricating oils, and the other handles filled containers of grease. The differential construction with center rail, illustrated here, is recommended for most conditions.

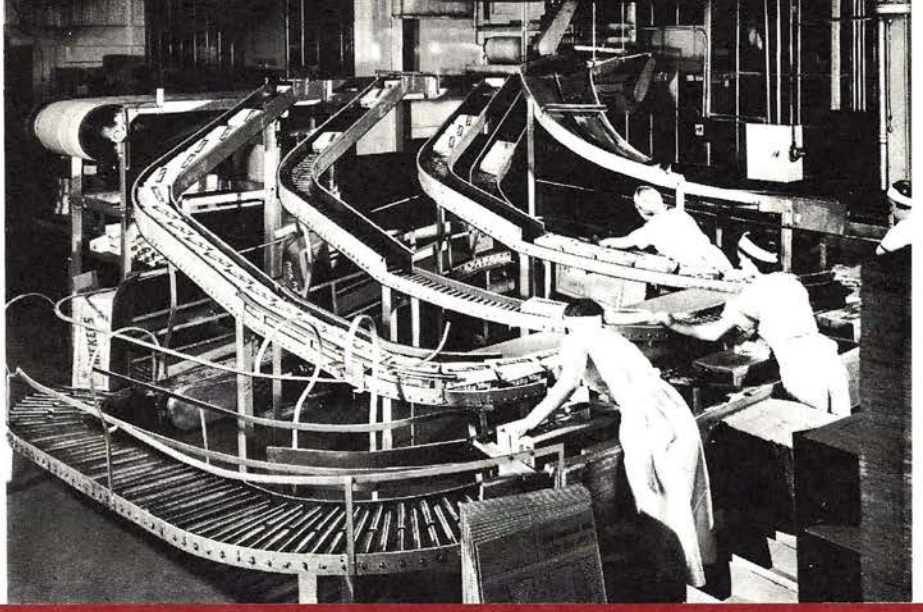
LEFT: Handling tote pans filled with small parts for automobile motors. Parts are received via overhead Roller Conveyor line and lowered by Logan Roller Spiral to floor level of stock room. No spillage here.

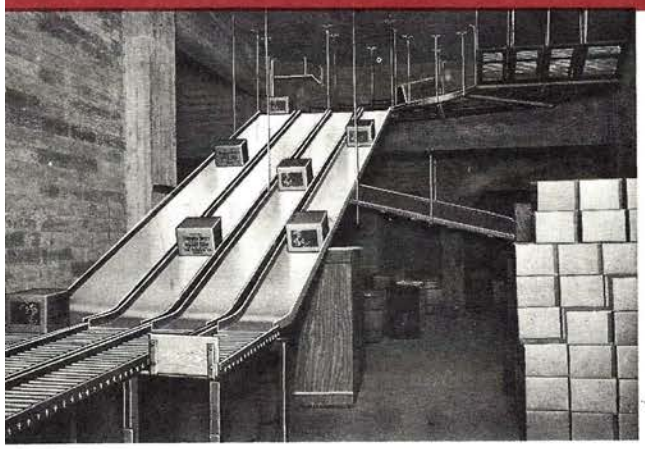
ABOVE: This Roller Spiral lowers kegs of nuts, bolts and heavy hardware from packing room on floor above, to storage area shown. No elevator delays or power required and virtually no maintenance. Roller Conveyor line on first floor leads through storage to shipping.

LEFT: Lowering telephone equipment and electrical parts to storage area from assembly and packing departments on floor above. Spiral serves as temporary storage.

SLIDES

STEEL Slides, while limited in application due to the steep pitch required, meet certain conditions very satisfactorily and economically. Their most common application is in Gravity lines to pass packages through floor thus decreasing size of floor opening. Either straight or curved Slides at various angles of decline are available as conditions require.





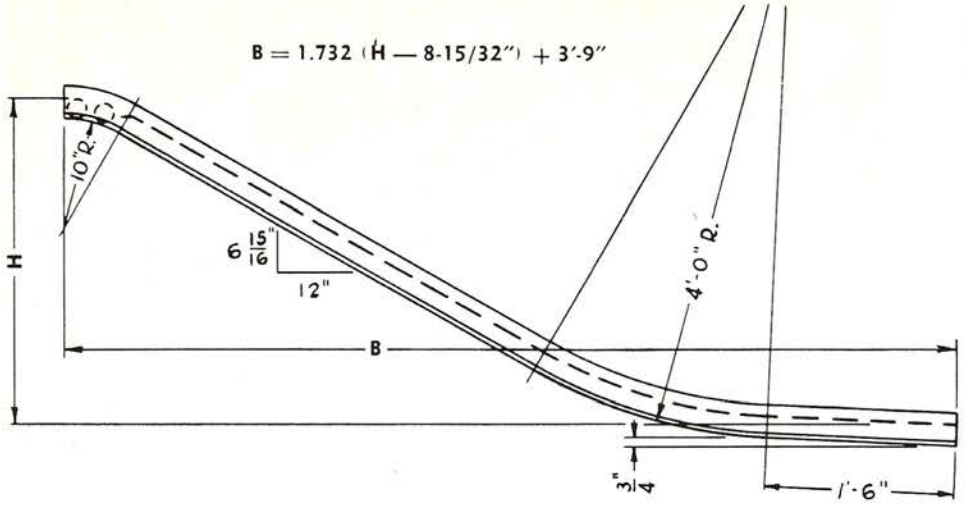
ABOVE: Two groups of straight Steel Slides handling cartons of coffee, syrup, and pancake flour. The cartons pass thru second floor, around Roller Conveyor curves, and down to first floor shipping department. The pitch or slope of Steel Slides can be varied to suit the material handled.

ABOVE: Small cartons of candy bars are lowered by Slides from overhead Belt Conveyors to convenient working height for packers. The slide beds are a combination of sheet metal and small close spaced rolls. The cartons are packed in large shipping cases on Roller Conveyor line in foreground and dispatched to sealing and shipping.

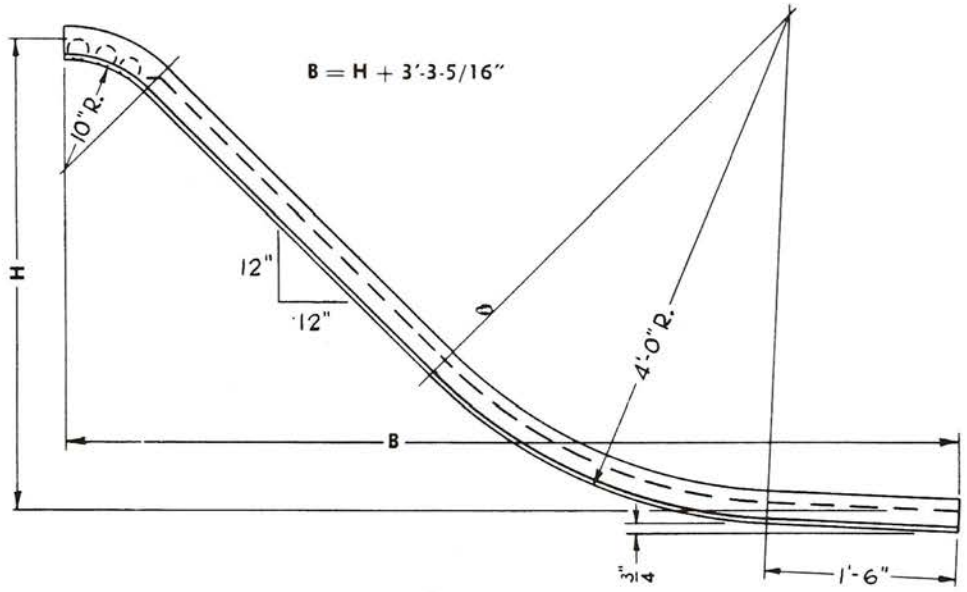
RIGHT: Cartons of electric lamps are dispatched from stitching machine on floor above to different warehouses via Logan Slides. Roller cleanout sections in bottom ends of each Slide facilitate discharge of light weight packages.

BELOW: Loading trucks for a manufacturer of baking powder and gelatin desserts. Slide is hinged and counterweighted to permit raising when not in use. The Roller Conveyor is mounted on casters and backed into building by degrees as truck is loaded.

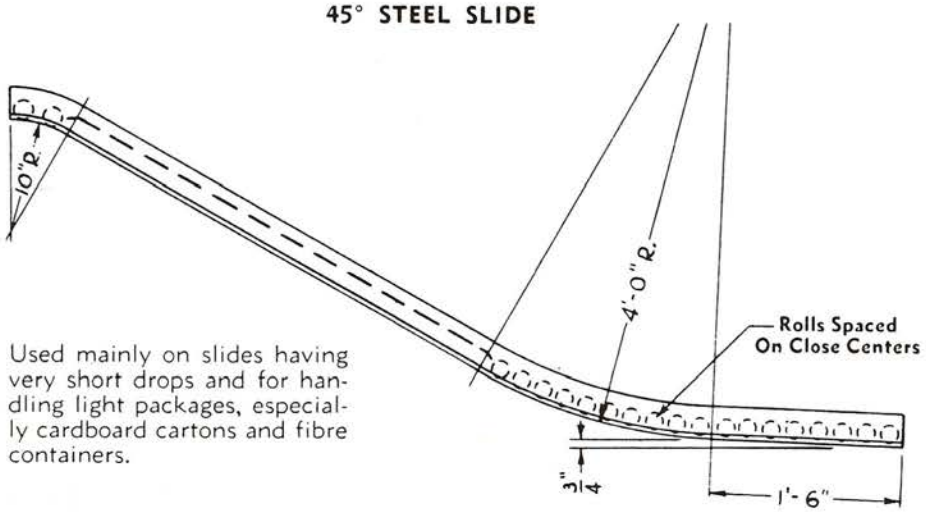
ABOVE: In a large Chicago warehouse, cartons of electrical supplies are lowered by Steel Slide to Gravity line in shipping room. Lower end of line is curved to discharge in desired direction. Installed around column to conserve floor space.



30° STEEL SLIDE

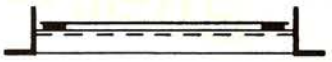


45° STEEL SLIDE



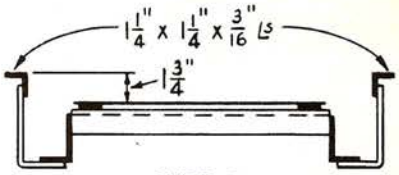
Used mainly on slides having very short drops and for handling light packages, especially cardboard cartons and fibre containers.

30° STEEL SLIDE
With Roller Cleanout

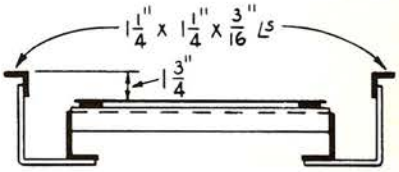


TYPE M
Guard Rails Optional

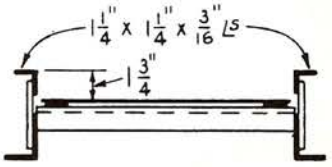
TYPE N
Guard Rails Optional



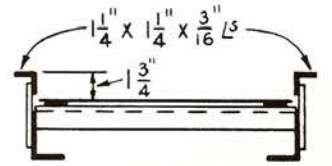
TYPE O
With Type A Guard



TYPE P
With Type A Guard



TYPE O
With Type B Guard



TYPE P
With Type B Guard

CROSS SECTIONS

General

Steel Slides, while limited in application due to the steep pitch required, meet certain conditions very satisfactorily and economically. Their most common application is in connection with a line of roller conveyor. This is particularly true where the conveyor line passes through a floor, as slides require a minimum size floor opening.

Due to the difficulty in controlling package speeds, slides must be used with caution, especially if packages are fragile or the contents breakable. They should never be used for storage.

Inclines

Slides may be furnished at any incline circumstances require. The permissible incline is governed by the center of gravity, weight, nature, and contents of packages handled. Slides of either 30° or 45° incline are standard and should be adhered to whenever possible as they require a minimum amount of engineering. The 30° slide best meets average conditions and is recommended where there is sufficient drop to allow packages to pass over "cleanout" section at bottom without stopping. The 45° slide is used for shorter drops and is also used for light packages.

Vertical Drop "H" Dimension

The maximum allowable vertical drop varies with the type and weight of packages, the angle of the slide, and sometimes the discharge conditions at the bottom. For average fibre cartons, the following will serve as a rough guide: on 30° slides the vertical drop should not exceed 7'-6"; on 45° slides it should not exceed 5'-0". Care must be taken to use enough drop to insure all packages passing over the straight portion at bottom of slide without stoppage.

Roller Cleanout

If the vertical drop available is not sufficient to prevent stoppage of packages in the straight "cleanout" portion at the bottom of a steel slide, close centered ball bearing rolls may be installed at this point. The roller cleanout is nearly always used with inclines less than 30° and is sometimes necessary at 30° if the packages are light. The length of packages handled should always be considered, as long packages may dig into the rolls sufficiently to cause trouble.

Top of Slide

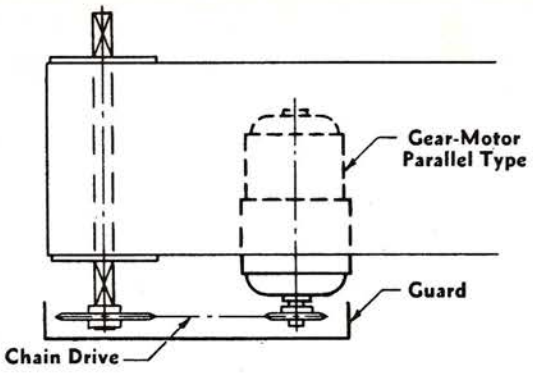
It is always desirable to have a straight roller section of at least the length of the longest package, leading onto the top of any slide. If the straight section is omitted, and a curve leads directly onto top of slide, there may be trouble at this point due to the front end of package getting over the top of frame angle or guard rail.

Bottom of Slide

A slide should never deliver directly onto a curve. There should always be at least 10'-0" of straight roller conveyor between bottom of slide and any curve. This allows room for slowing down package if necessary before it reaches the curve. Also, to prevent damage due to packages bumping into each other, they should never be allowed to accumulate within 10'-0" of bottom of slide. For heavy packages 20'-0" or more is desirable.

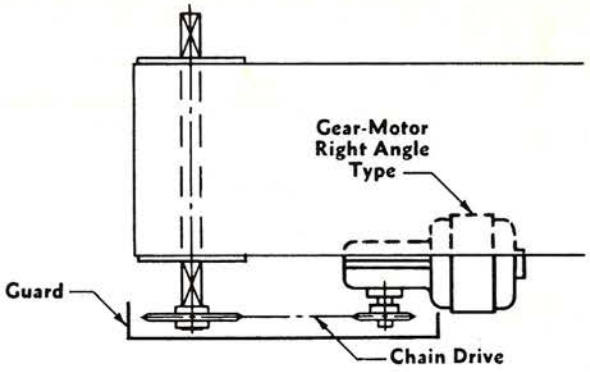
Most Logan Power Conveyors are made to order and are designed by skilled engineers to suit the exact requirements of each job. In so far as possible, certain units have been standardized with resulting economies in production.

Due to the broad scope of Power Conveyors it is impossible to cover all available types. The sketches and other data illustrate the main classifications without attempting to show the many variations. These principle types are as follows:



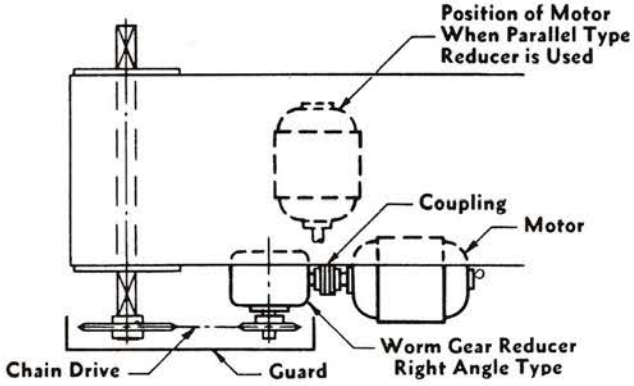
TYPE "DA"–Constant Speed

Parallel type gear-motor connected to drive shaft through roller chain drive. Most efficient drive for all nominal speeds. Helical gearing requires minimum horsepower.



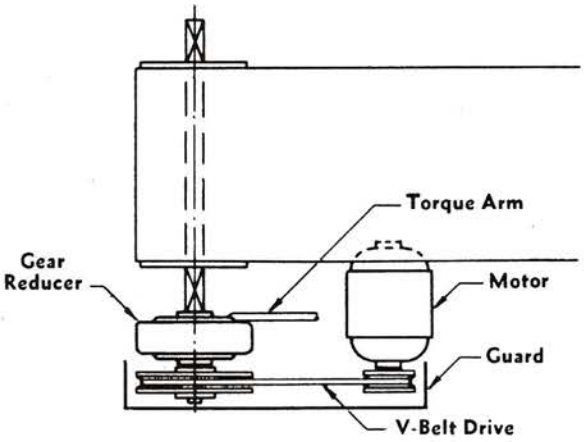
TYPE "DB"–Constant Speed

Right angle type gear-motor connected to drive shaft through roller chain drive. Usually lower in first cost than Type "DA". Less efficient worm gearing frequently requires larger motor.



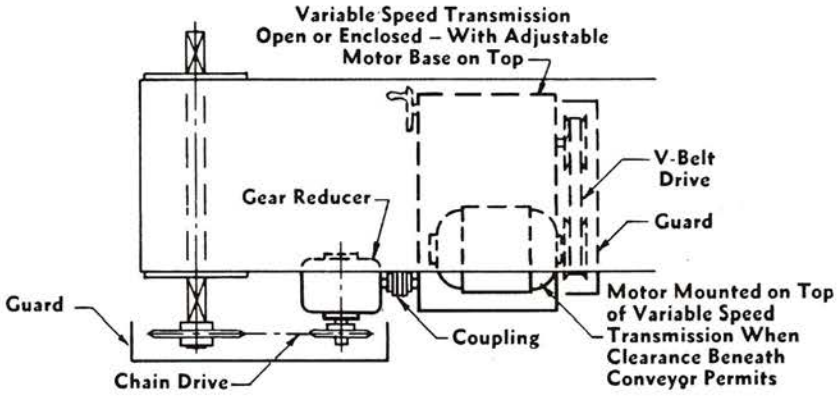
TYPE "DC"–Constant Speed

Motor coupled to either right angle type or parallel type gear reducer and connected through roller chain drive to drive shaft. Normally used for slow speeds requiring greater reduction than obtainable with gear-motor.



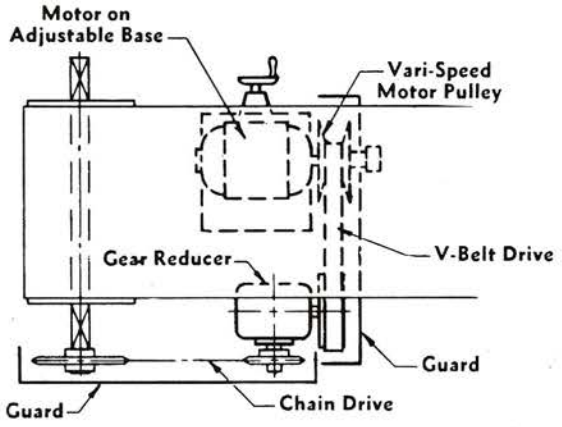
TYPE "DD"–Constant Speed

Motor with V-belt drive to gear reducer unit mounted on drive shaft. Suitable only for normal speeds and average loads.



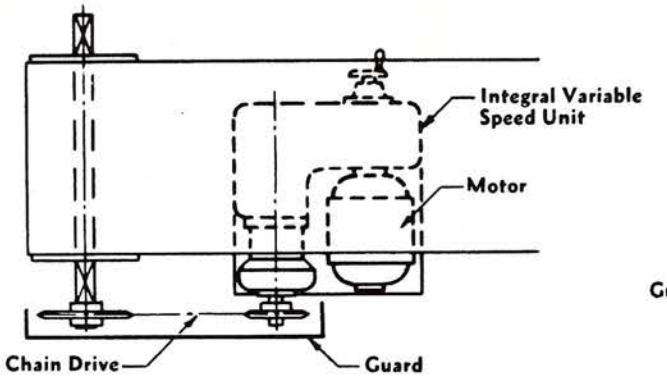
TYPE "DE"–Variable Speed

Motor and variable speed transmission connected through gear reducer and roller chain drive to drive shaft. Ordinarily recommended for conditions requiring heavy drives and more than 3 to 1 speed variation.



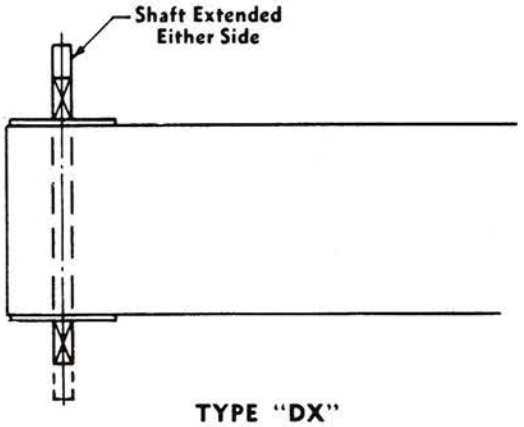
TYPE "DF"–Variable Speed

Motor with vari-speed pulley and V-belt drive connected through gear reducer and roller chain drive to drive shaft. Most economical for average conditions requiring not more than 3 to 1 speed variation.



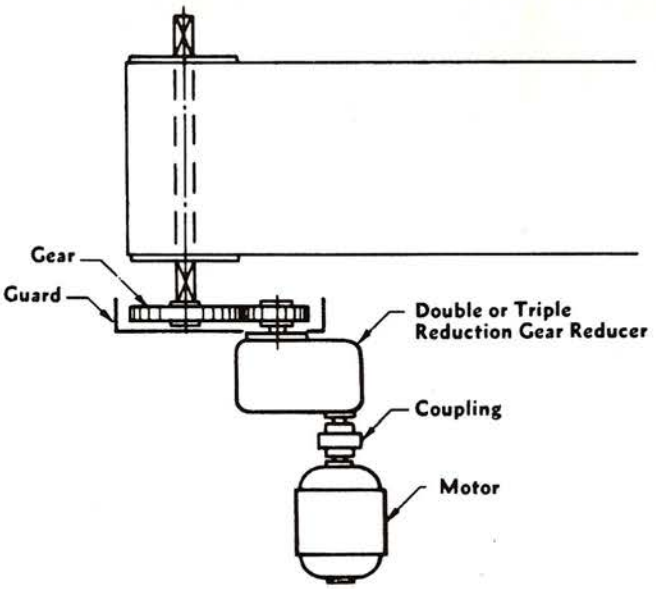
TYPE "DG"–Variable Speed

Integral Variable Speed Unit connected through roller chain drive to drive shaft. Integral construction requires less space than Type "DE". Also recommended where enclosed drive is desirable.



TYPE "DX"

Where drive unit is furnished by others or where driven from connecting conveyor.



TYPE "DH"–Constant Speed

Motor coupled to gear reducer and connected through spur gear drive to drive shaft. Required for very slow-speed heavily loaded conveyors, usually of the apron type.

GENERAL NOTES

Drive arrangements shown are typical for Belt, Live Roller, Slat, and Chain Conveyors. The simplest and usually most satisfactory drive is the gear-motor with roller chain connection to headshaft. The gear-motor has reduction gearing built as an integral part of motor and in same housing, forming a very compact unit. With anti-friction bearings throughout and gearing fully enclosed and running in oil, the operation is quiet and efficient. Installation is simple, as there is no alignment problem between motor and reduction unit and no coupling required.

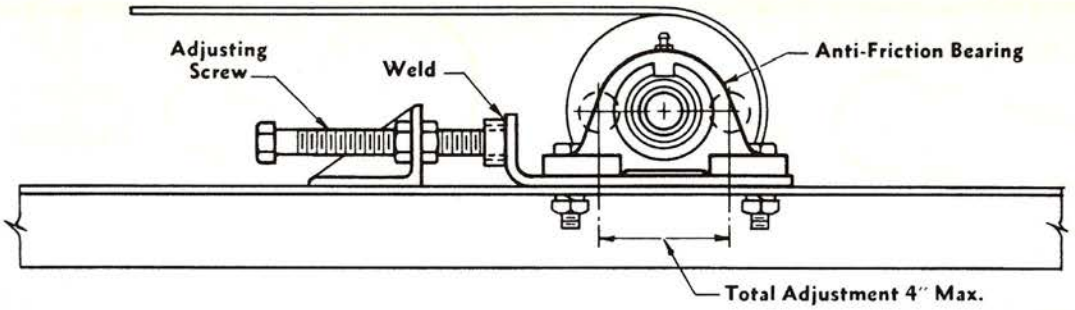
If space conditions permit, the drive is usually located underneath or to one side of conveyor. Where required, it may be mounted overhead.

Power conveyors can be designed to operate at any desired speed consistent with sound engineering practice. The slower the speed the greater the reduction necessary and ordinarily the greater the initial cost. On the other hand, a higher speed than required results in unnecessary wear on all moving parts.

Head and tail shafts are usually mounted in self-aligning ball or roller bearing pillow blocks with alemite lubrication. Bronze bushed bearings can be furnished to meet special conditions.

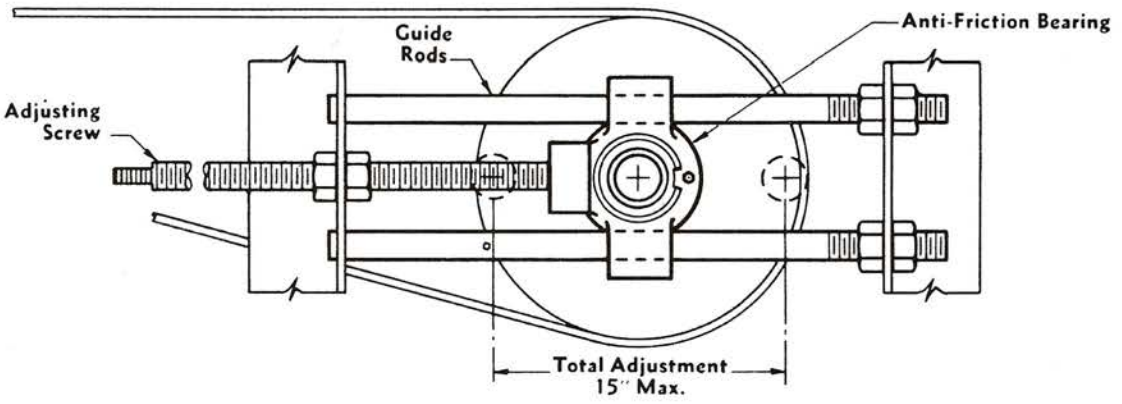
On Variable Speed Drives, the speed adjustment is shown manually operated. Types "DE" and "DG" can be furnished with power operated remote control.

For protection against overloads or jams which might damage drive equipment, an automatic safety slip clutch between motor and reducer is frequently used. This is also used to provide cushioned easier starting—particularly desirable on heavily loaded conveyors.



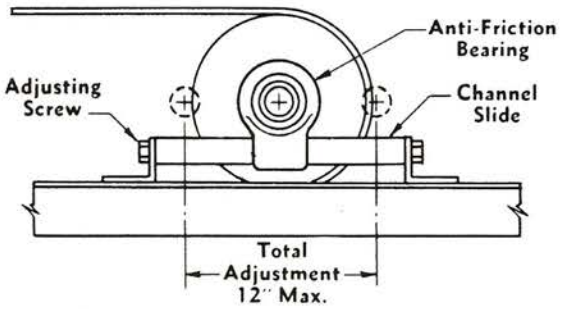
TYPE "TA" TAKE-UP

Self-aligning ball bearing pillow blocks with alemite lubrication. Pillow blocks bolted through slotted holes in frame. Used only for short light type conveyors requiring small adjustment.



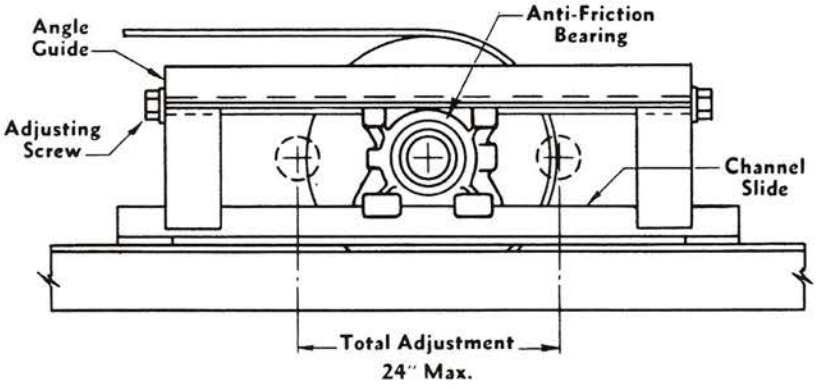
TYPE "TB" TAKE-UP

Self-aligning ball bearings with alemite lubrication. Bearings slide on two 7/8" diameter steel rods with 7/8" diameter adjusting screw. Recommended for medium duty power conveyors. Total adjustment varies according to requirements of each conveyor.



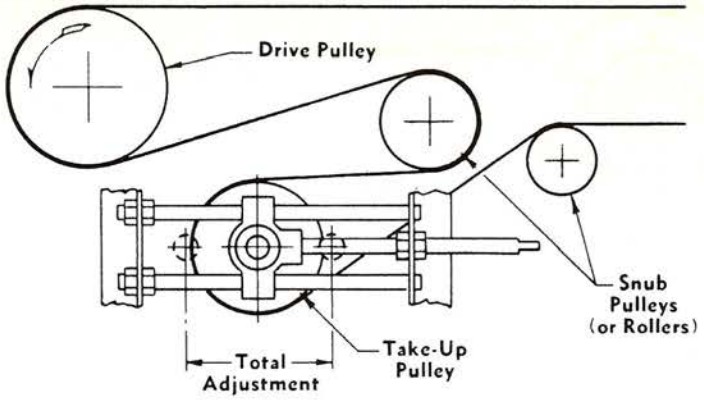
TYPE "TC" TAKE-UP

Self-aligning ball bearings with alemite lubrication. Bearings mounted on channel slide with protected adjusting screw. Used for light type Belt and Live Roller Conveyors, where more adjustment is required than can be obtained with Type "TA".



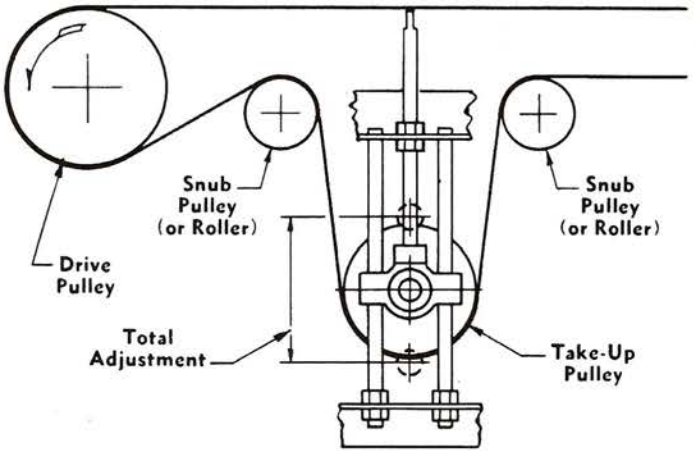
TYPE "TD" TAKE-UP

Self-aligning ball or roller bearing with alemite lubrication. Bearings mounted on channel slide with angle guide and protected adjusting screw. Recommended for heavy duty power conveyors where more adjustment or heavier construction is required than can be obtained with Type "TB".



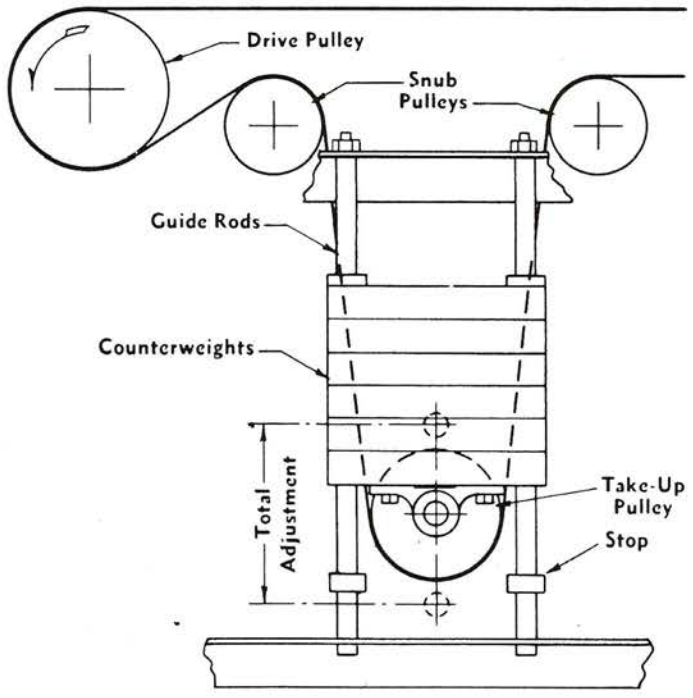
TYPE "TX" HORIZONTAL TAKE-UP AT DRIVE END

Same as Type "TB" except located in drive frame. Used on Belt and Live Roller Conveyors where conditions prevent locating at tail end or where desirable to hold tail pulley in a fixed position.



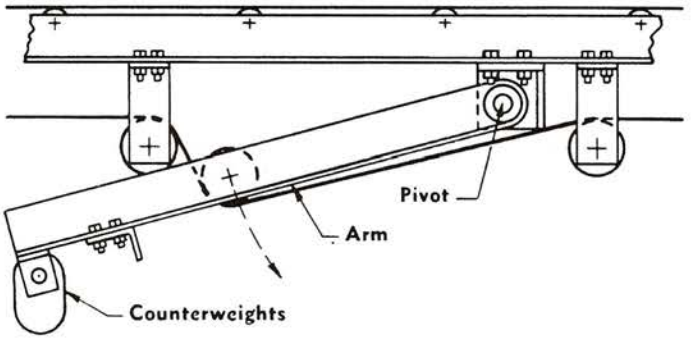
TYPE "TX" VERTICAL TAKE-UP AT DRIVE END

Can be furnished in place of Type "TX" Horizontal if preferred. Designated as Type "TE" when used on Belt Conveyors where take-up is located in three-pulley bend.



TYPE "TY" AUTOMATIC TAKE-UP

Recommended for Belt and Live Roller Conveyors where conveyor is very long or is subject to wide variation in atmospheric conditions causing excessive expansion and contraction in belt. Should be located as near drive pulley as possible.



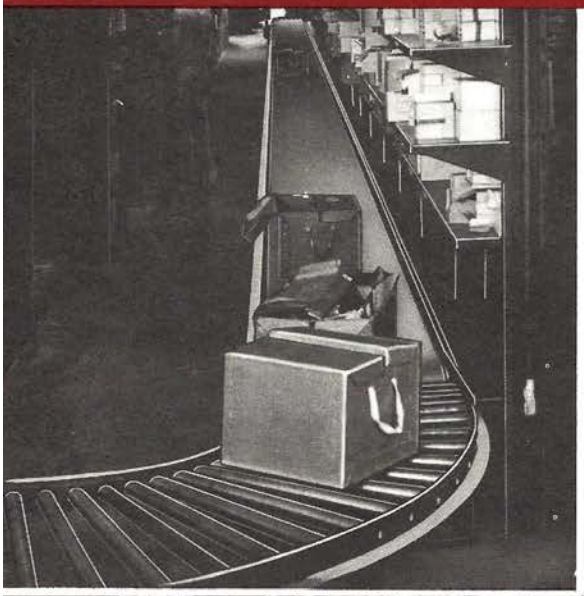
TYPE "TZ" SWING ARM AUTOMATIC TAKE-UP

Used on very short light duty Belt and Live Roller Conveyors where desirable to hold tail pulley in a fixed position.

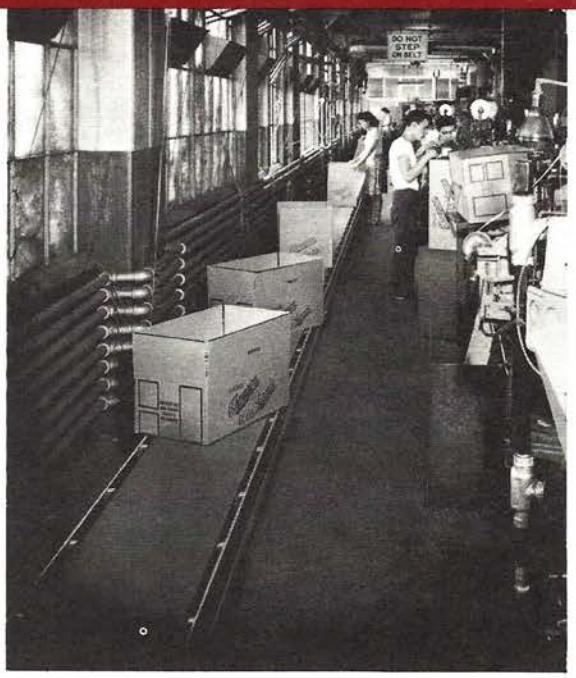
BELT CONVEYORS

ABOVE: Cartons of asphalt tile are lowered from sealing machines on floor above by declining Belt Conveyors. Feeder sections at discharge end facilitate delivery to Roller Conveyor.

FLAT BELT CONVEYORS have a broader field of usefulness than any other type of power conveyor. They are similar in application to Live Roller Conveyors and in addition will handle packages or materials not adapted to handling in direct contact with the rolls. They operate satisfactorily at moderate inclines. Change in direction from horizontal to incline and vice versa can be accomplished through the proper arrangement of snub pulleys. Can also be made reversible or made two-way.



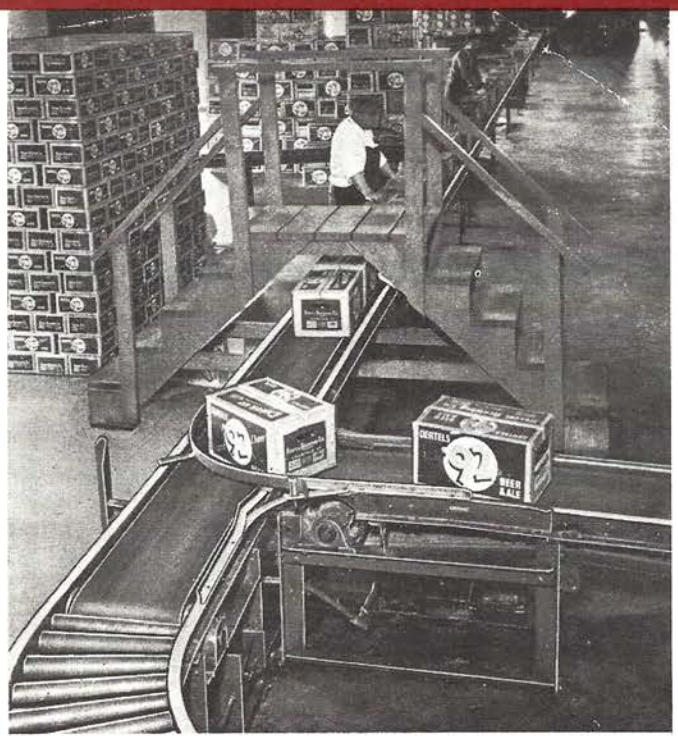
LEFT: This horizontal Belt Conveyor handles parts to and from storage. Part of a complete Logan system in assembly plant and warehouse for telephone equipment.



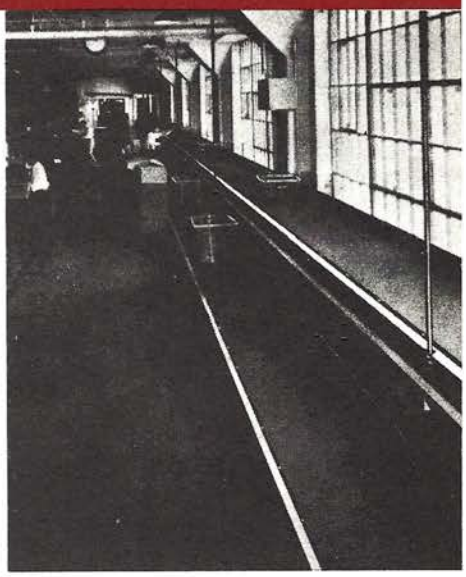
ABOVE: Belt Conveyor which receives cartons of electric lamps from operators at packing stations alongside, and forwards the cartons to stitching machines and warehouse for storage. Conveyor is set horizontal at convenient height.

LEFT: Storage room for cases of empty bottles in bonded distillery bottling plant and warehouse. Incoming line at right consists of declining Belt Conveyor and horizontal Live Roller Conveyor. Outgoing cases are fed by overhead Roller Conveyor and declining Belt Conveyors to bottling operations on floor below.

RIGHT: Belt Conveyors in weave room of textile mill. Long overhead conveyor is double deck and both runs of belt are used for conveying. Top deck handles tubs of filled bobbins to looms and lower deck returns empty tubs. Conveyor is fed by Inclined Belts in rear. Part of a complete Logan system serving spinning and weaving operations.



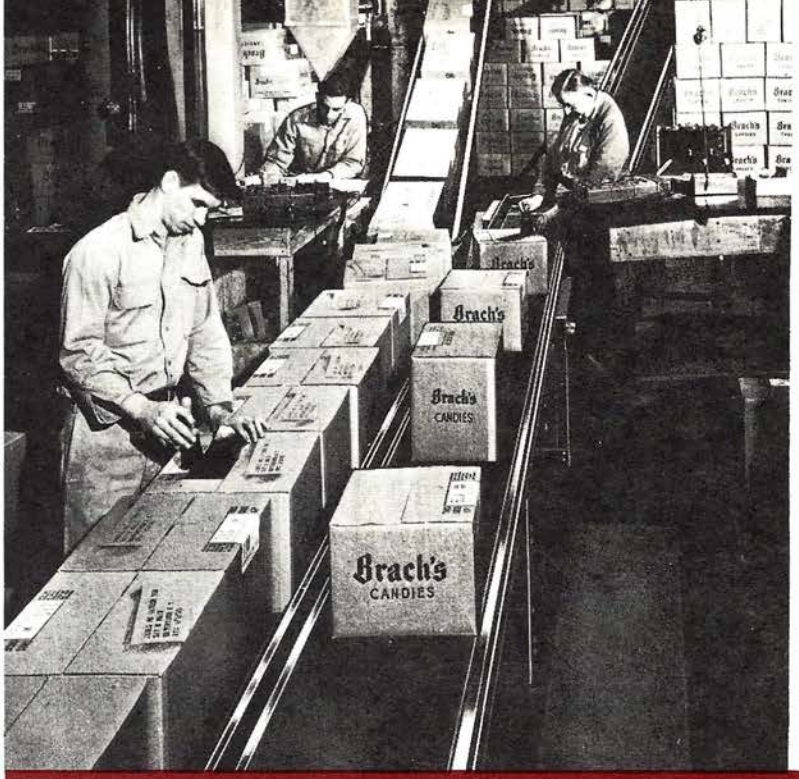
ABOVE: This brewery handles cases from packer direct to truck loading dock by Belt Conveyors and Roller Conveyor spur lines. Main Belt Conveyor line has a reversible section to permit routing cases to storage via line at end of conveyor in foreground if desired.

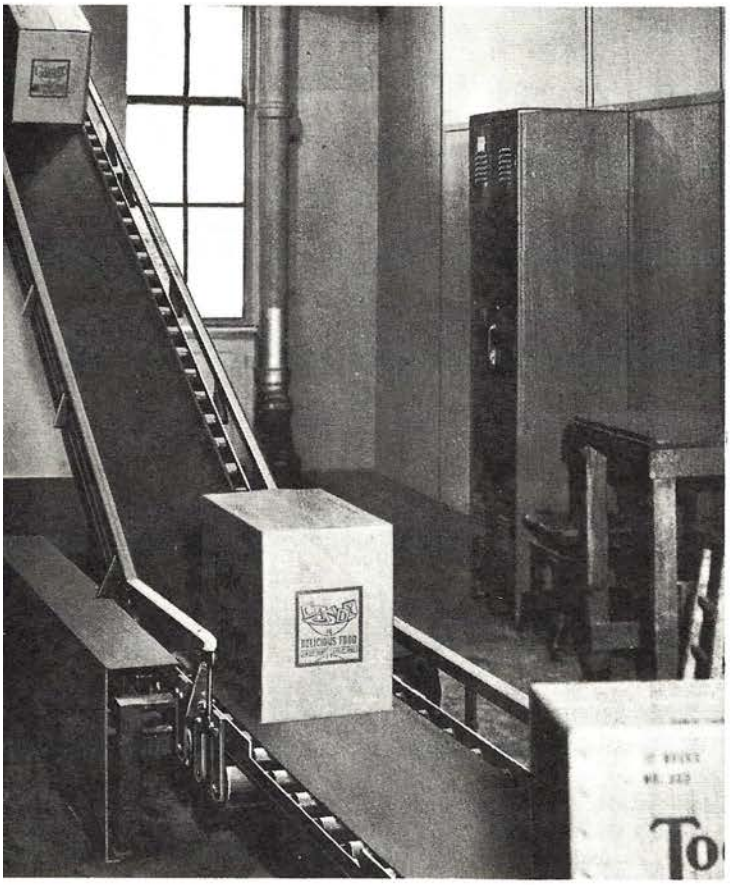


RIGHT: Two 36" Belt Conveyors, 250 feet long, running full length of order department, convey baskets of art-needlework products which are filled from stock bins alongside. Belts are double decked to conserve floor space.

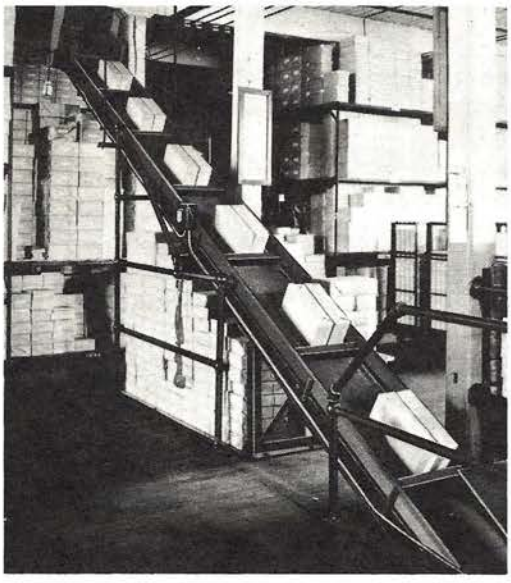
RIGHT: Sorting Belt Conveyors in foundry of a New England loom manufacturer. Conveyors are slider bed type and handle a variety of shapes and sizes. Operators sort castings into baskets alongside conveyors.

RIGHT: Belt Conveyors handling cartons of candy through stenciling operation. Sheet steel beds in horizontal runs insure a firm working surface. Inclined Belts have roller beds and discharge to overhead lines leading to shipping dock. Incline is at 25° and no cleats are required.



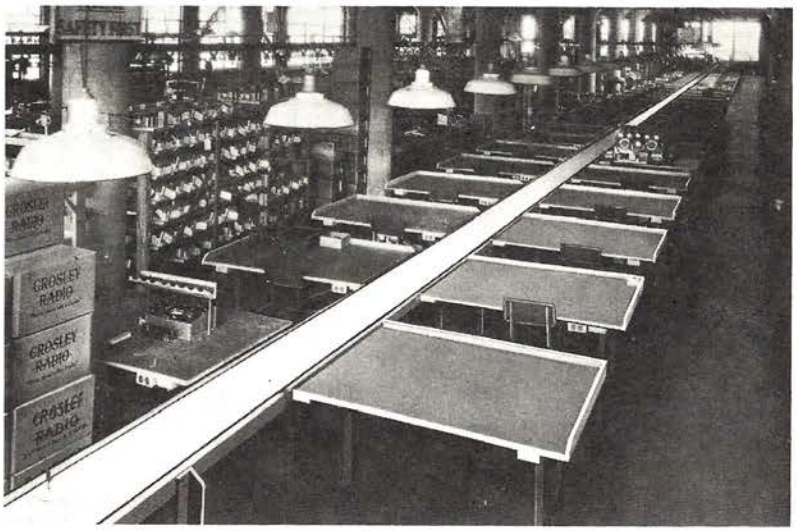


LEFT: Typical 25° Inclined Belt Conveyor. Cartons of candy are received from sealing machine in foreground. Belt Conveyor transports up incline and across two buildings and delivers to Logan Spiral Chute to shipping platform. Conveyors make two buildings as one.



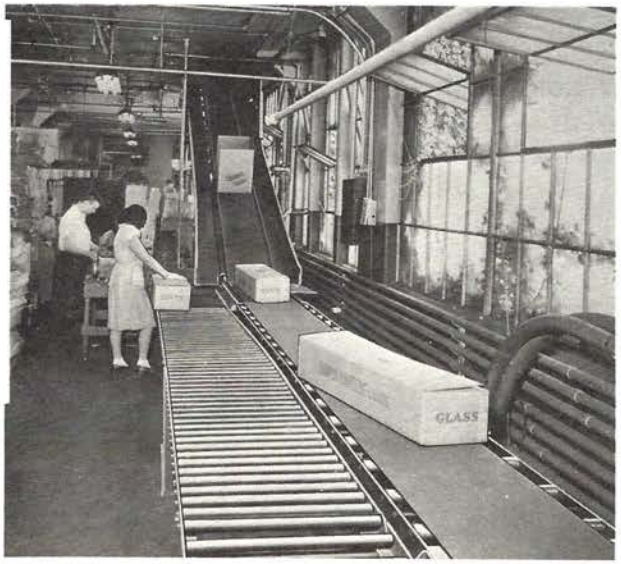
LEFT: Belt Conveyors may be used in steep inclines if equipped with cleats. These necessitate carrying return run on slide strips. This Belt conveys bundles of stationery serving three floors of manufacturing building and on up to 5th and 6th floors of storehouse located across street.

ABOVE: Handling batch pans of rubber compound. The partition guard through center of wide belt provides two Belt Conveyors at little more than the cost of one. The Belt discharges to two separate Gravity lines, one leading to sifter and the other to Banbury mixer.

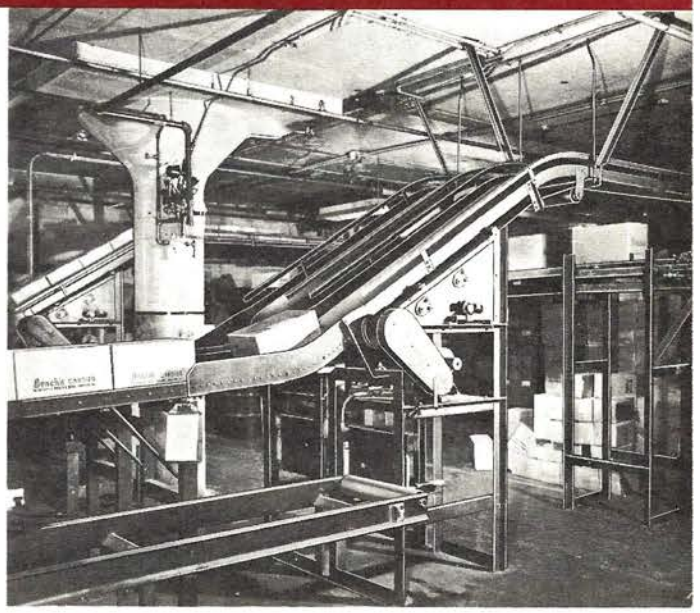


ABOVE: Radio assembling and testing operations are paced by this Belt Conveyor with work tables attached to each side. Belt runs on a sheet steel slider bed.

ABOVE: Conveyor Packing Table with slow moving Belt in center and work boards along both sides. This unit speeds packaging of drug products with minimum effort.

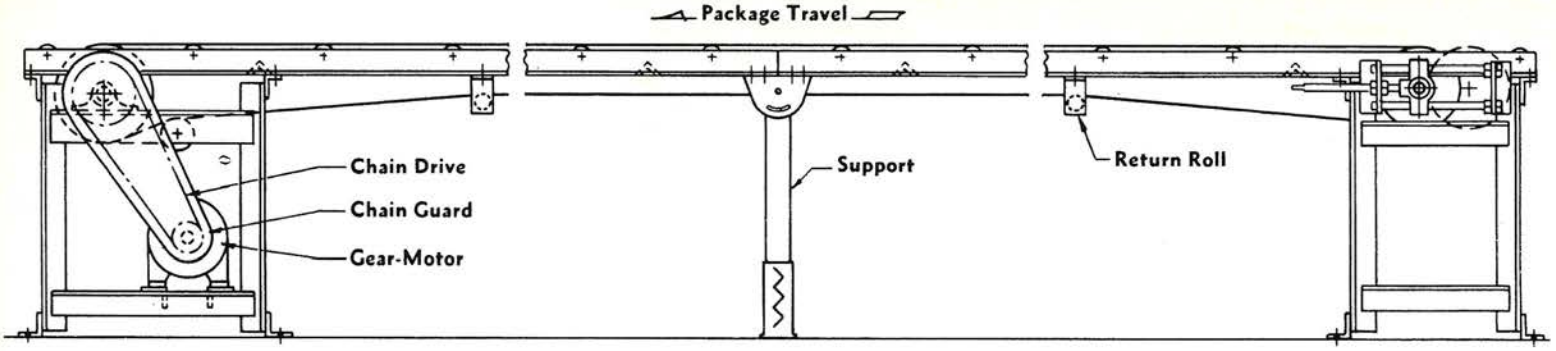


LEFT: Fluorescent lamps are packed on Roller Conveyor work table, then **shunted to horizontal** and inclined Belt Conveyor leading to stitching machines and storage. Belt in rear lowers lamps from floor above.



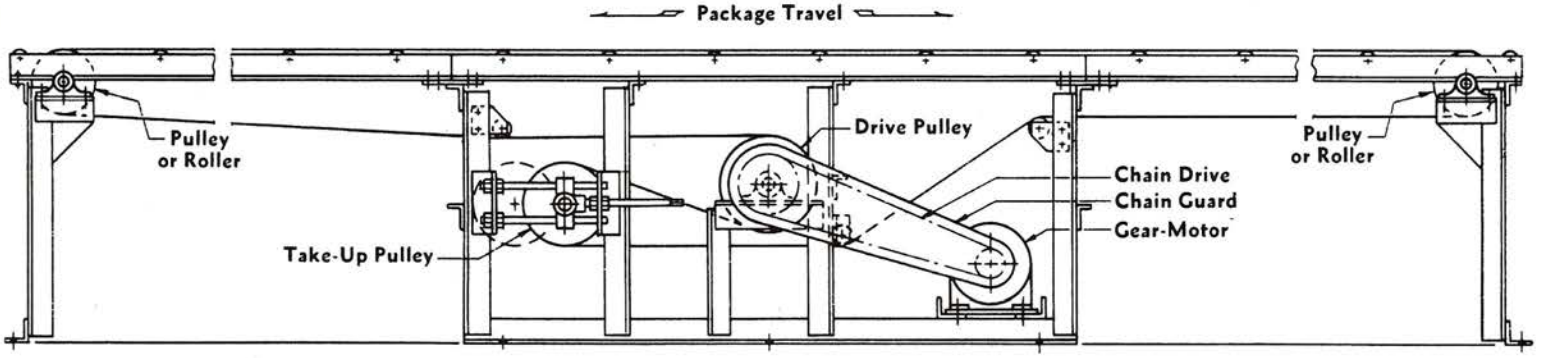
ABOVE: Declining Belt Conveyors with roller cleanouts at discharge for delivery to Roller Conveyor. These Belts and the similar units shown in rear handle cartons of candy to truck loading dock.

LEFT: Hinged Belt Conveyors speed unloading operations at this central warehouse for nationally known maker of pharmaceutical and biological products. Conveyor equipped trailer brings products from nearby manufacturing plant. The Hinged Belts are raised and lowered by electric hoists to connect with three tiers of Roller Conveyor in trailer.



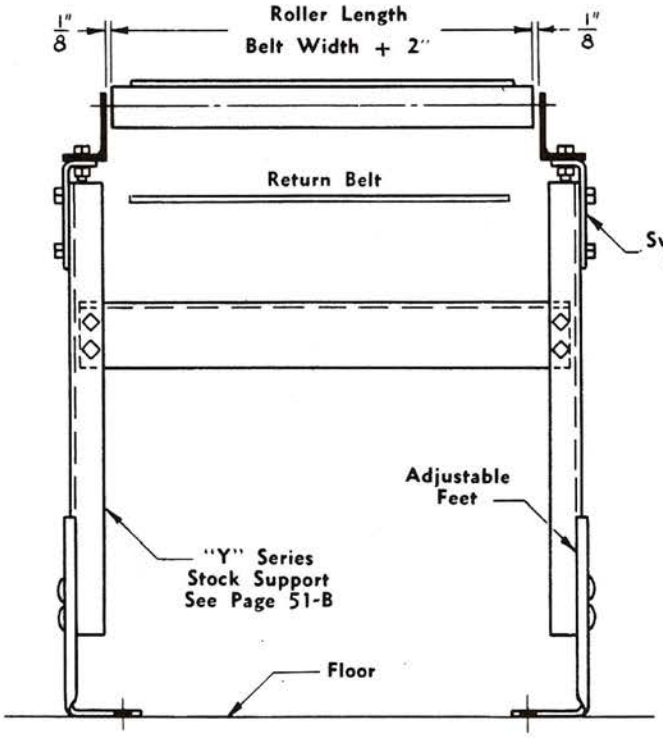
GENERAL ASSEMBLY OF BELT CONVEYOR

Showing drive at discharge end. This is normal construction for non-reversible belt conveyors.

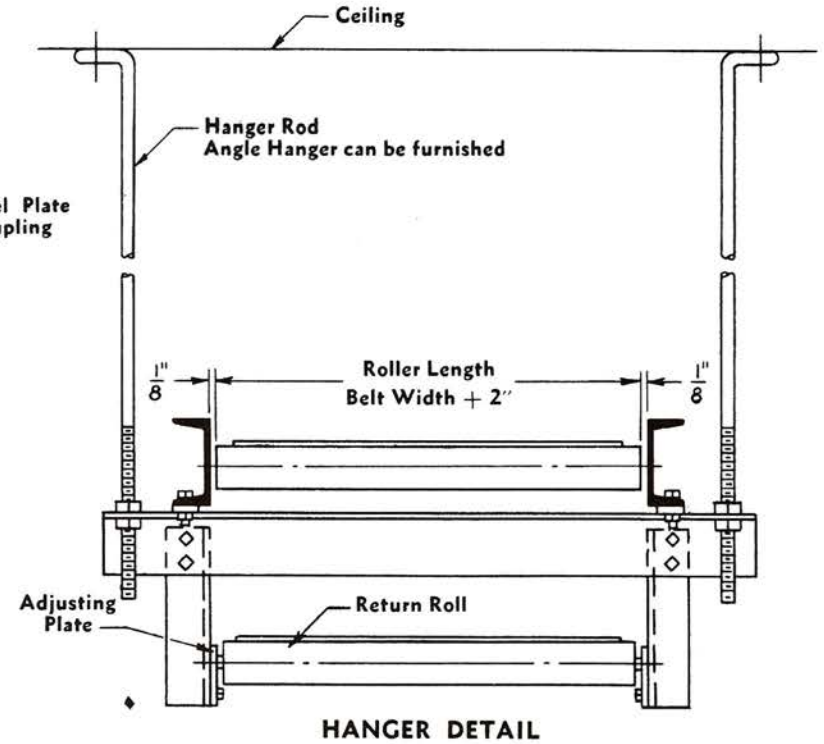


GENERAL ASSEMBLY OF REVERSIBLE BELT CONVEYOR

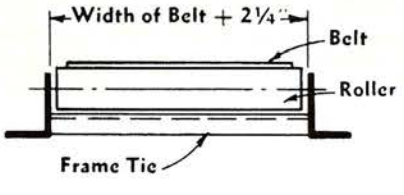
Showing intermediate drive and take-up unit. This construction is recommended for reversible belt conveyors depending upon length of conveyor and load handled.



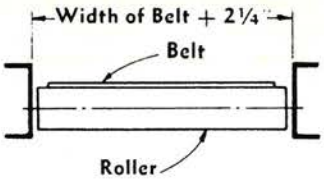
SUPPORT DETAIL



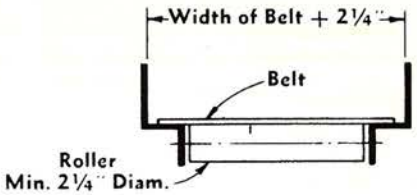
HANGER DETAIL



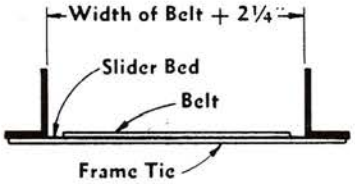
TYPE "BA"



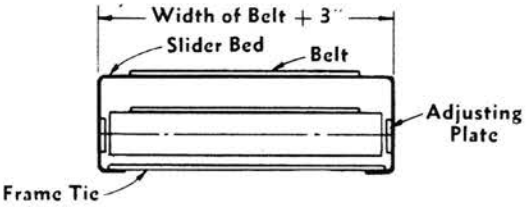
TYPE "BB"



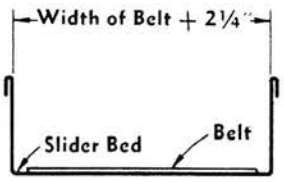
TYPE "BC"



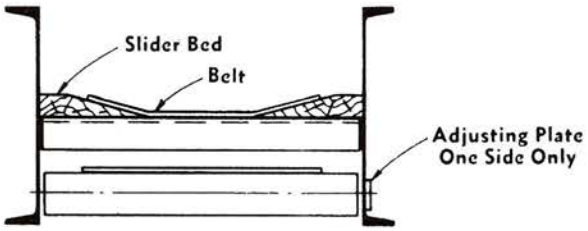
TYPE "BD"



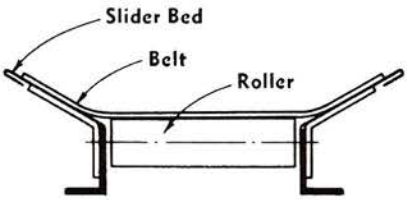
TYPE "BE"



TYPE "BF"

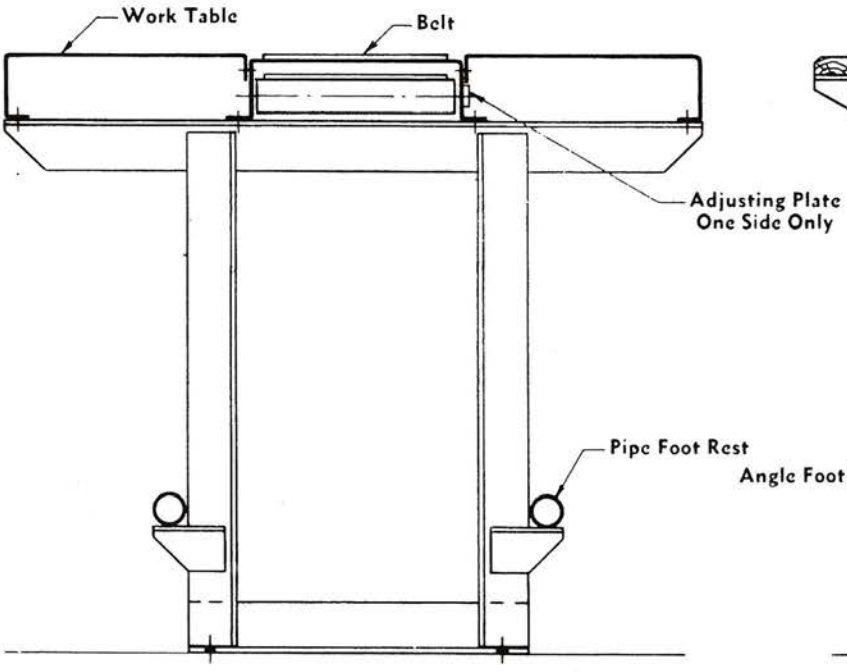


TYPE "BG"

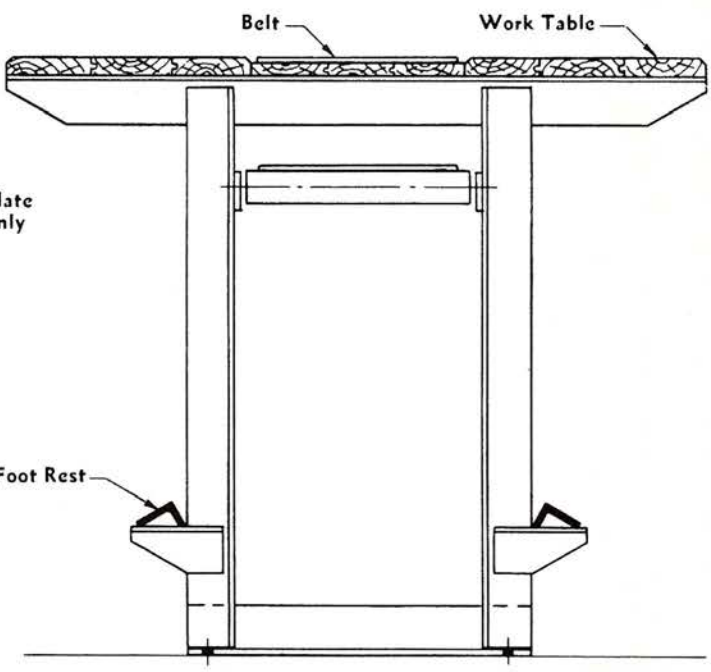


TYPE "BH"

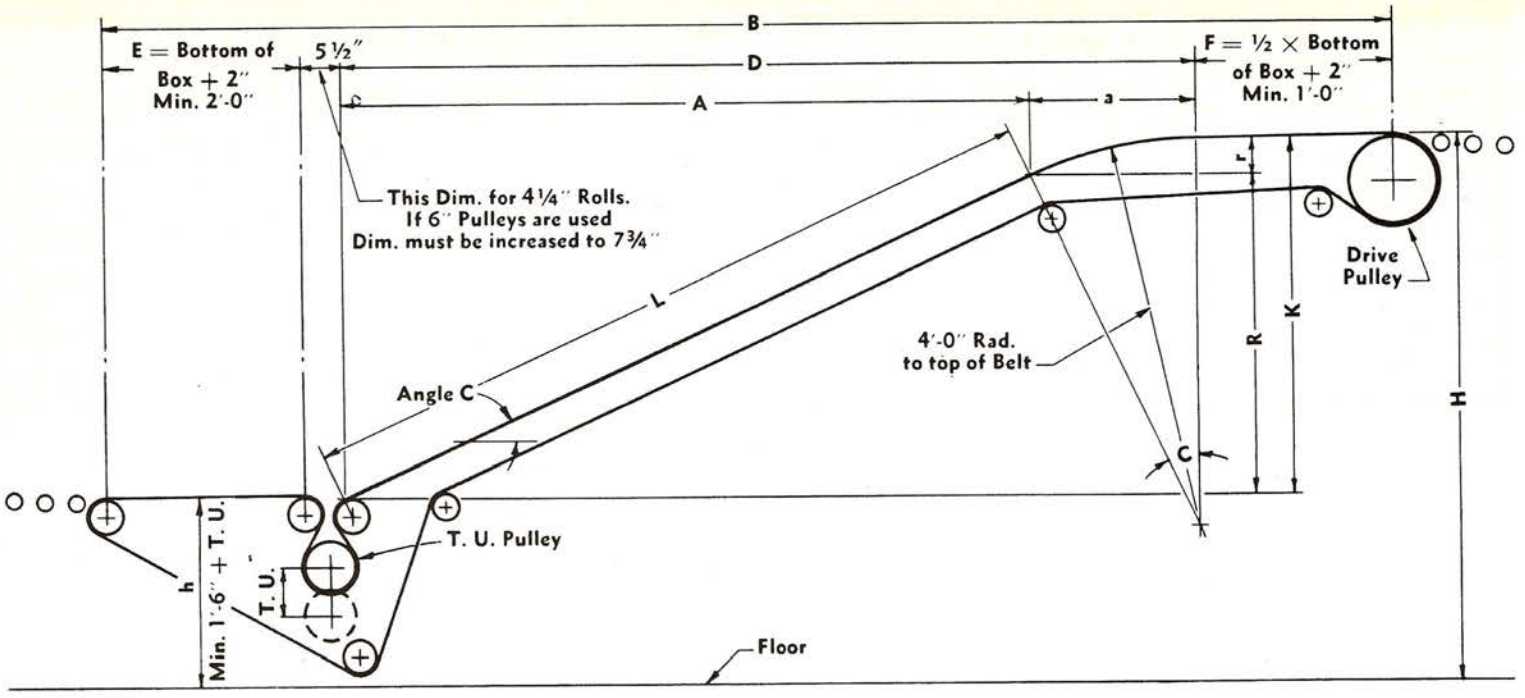
CROSS SECTIONS OF BELT CONVEYORS



WORK TABLE – METAL TOP



WORK TABLE – WOOD TOP



FORMULA FOR 25° INCLINE (5⅝" IN 12" SLOPE)

Known: H, h, and Angle C

$r = 4\frac{9}{16}"$
$a = 1'\text{-}8\frac{3}{8}"$
$K = (H - h) + \frac{1}{2}"$
$R = K - 4\frac{9}{16}"$
$A = R \times 2.1334$
$L = R \div .4245$
$D = A + 1'\text{-}8\frac{3}{8}"$
$B = (D + E + F) + 5"$

Known: B, h, and Angle C

$D = B - (E + F + 5")$
$a = 1'\text{-}8\frac{3}{8}"$
$r = 4\frac{9}{16}"$
$A = D - 1'\text{-}8\frac{3}{8}"$
$R = A \times .4688$
$H = (R + h) + 4\frac{1}{16}"$
$L = R \div .4245$

FORMULA FOR INCLINES OTHER THAN 25°

Known: H, h, and Angle C

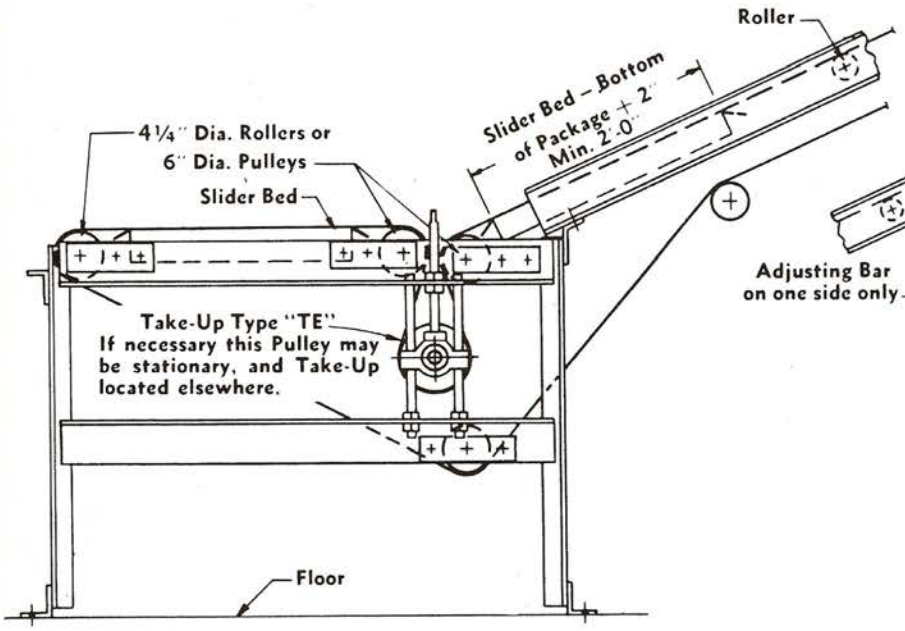
$r = 4'\text{-}0" - (4'\text{-}0" \times \text{Cos C})$
$a = 4'\text{-}0" \times \text{Sin C}$
$K = (H - h) + \frac{1}{2}"$
$R = K - r$
$A = R \times \text{Cot A}$
$L = R \div \text{Sin C}$
$D = A + a$
$B = (D + E + F) + 5"$

Known: B, h, and Angle C

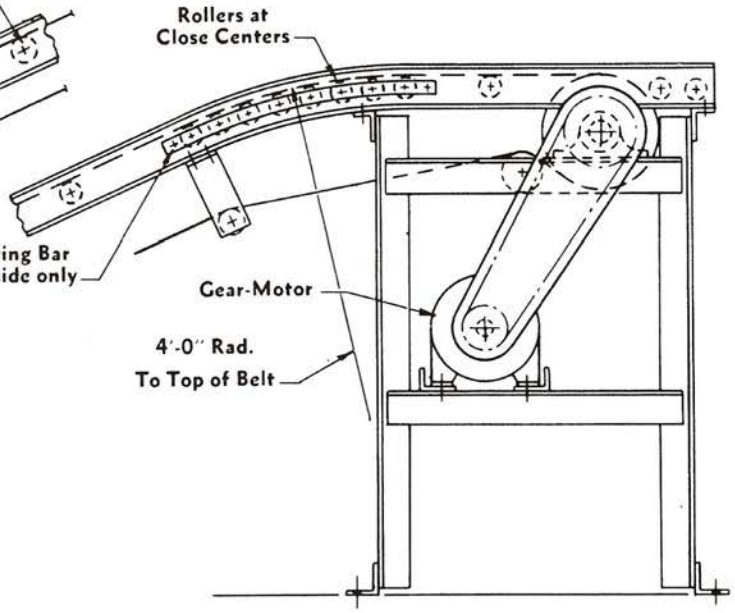
$D = B - (E + F + 5")$
$a = 4'\text{-}0" \times \text{Sin C}$
$r = 4'\text{-}0" - (4'\text{-}0" \times \text{Cos C})$
$A = D - a$
$R = A \times \text{Tan C}$
$H = (R + r + h) - \frac{1}{2}"$
$L = R \div \text{Sin C}$

See top of Page 113 for Functions of Angle "C"

Above formulae apply only to elevating conveyors but may be used for approximate dimensions of lowering and reversible conveyors. Actual dimensions will be determined by Louisville office.



DETAIL OF TAIL END



DETAIL OF DRIVE END

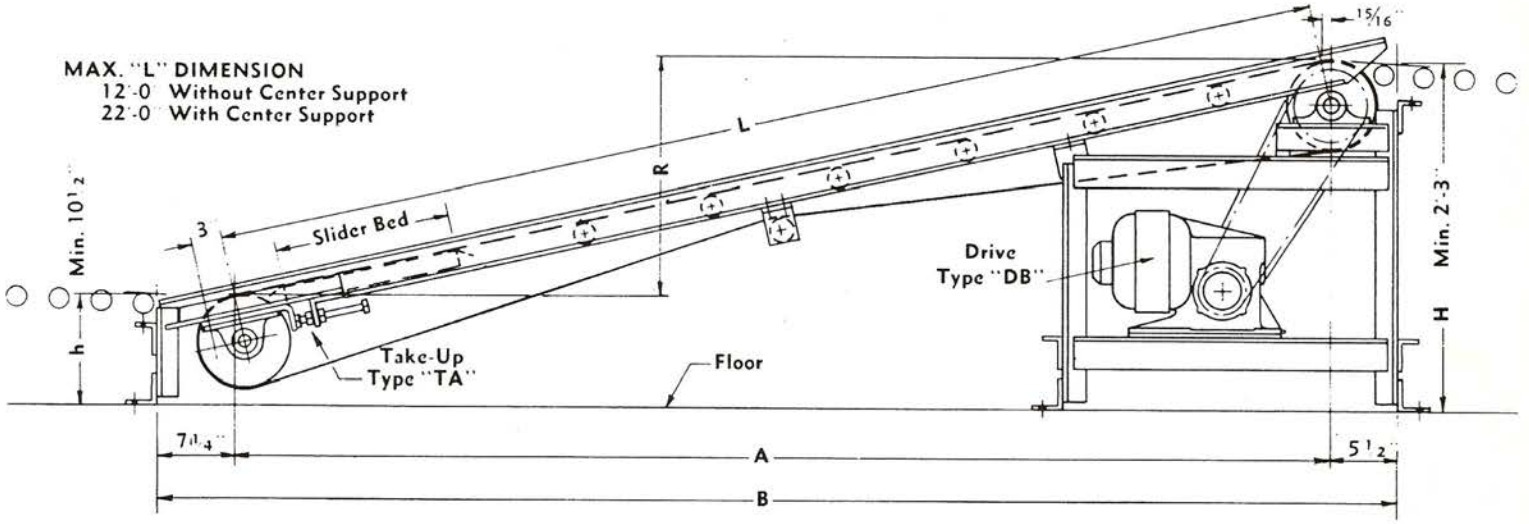
FUNCTIONS OF ANGLE "C"				
Degrees	Tangent	Cotangent	Sine	Cosine
10	0.1763	5.6713	0.1736	0.9848
12½	0.2217	4.5107	0.2164	0.9763
15	0.2679	3.7321	0.2588	0.9659
16	0.2867	3.4874	0.2756	0.9613
17	0.3057	3.2709	0.2924	0.9563
18	0.3249	3.0777	0.3090	0.9511

FUNCTIONS OF ANGLE "C"				
Degrees	Tangent	Cotangent	Sine	Cosine
20	0.3640	2.7475	0.3420	0.9397
22	0.4040	2.4751	0.3746	0.9272
24	0.4452	2.2460	0.4067	0.9135
25	0.4663	2.1445	0.4226	0.9063
26	0.4877	2.0503	0.4384	0.8988
28	0.5317	1.8807	0.4695	0.8829

MAXIMUM INCLINES – IN DEGREES			
	Canvas Belt	Rubber Covered	Rough or Claw Top
Bags, Paper	12½	18	25
Cartons,Cardboard	12½	18	25
Metal Drums	10	16	25
Newspaper, Bundles	12½	18	25
Paint Cans	10	15	18
Sacks, Cloth	12½	17	25
Steel Tote Pans	10	16	25
Wood Boxes or Crates	12½	18	25

When receiving from gravity without horizontal belt feeder or three pulley bend the maximum incline for package transfer is 10° for canvas belting and 12½° for rubber covered.

Inclines listed are maximum under ideal conditions. Consult with Louisville Office, especially when oil, soapstone, or moisture is present. Cans or drums partially filled with liquid also require special consideration for center of gravity and surging of contents.



Known: H and h

$R = (H - h) + 7/16"$

$L = R \times 4.6202$

$A = R \times 4.5107 + 15/16"$

$B = A + 1'\text{-}0\frac{3}{4}"$

Known: B and h

$A = B - 1'\text{-}0\frac{3}{4}"$

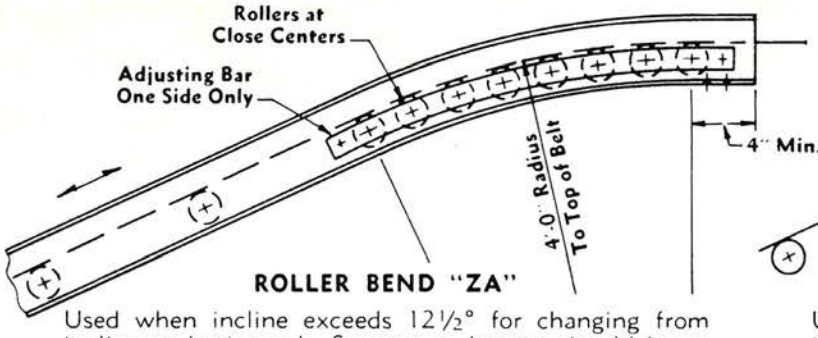
$L = (A - 15/16") \times 1.0243$

$R = (A - 15/16") \times 0.2217$

$H = (R + h) - 7/16"$

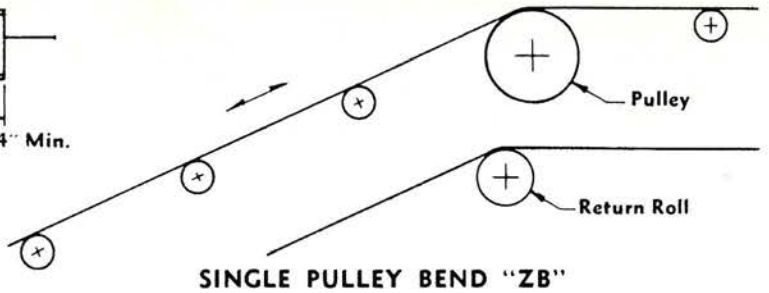
12½° BELT BOOSTER

Above formula is for estimating only. Actual dimensions will be determined by Louisville Office.
For inclines exceeding 12½° use Inclined Belt Conveyor. See Page 112.



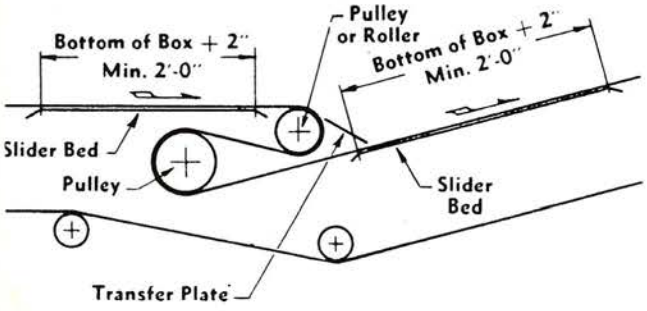
ROLLER BEND "ZA"

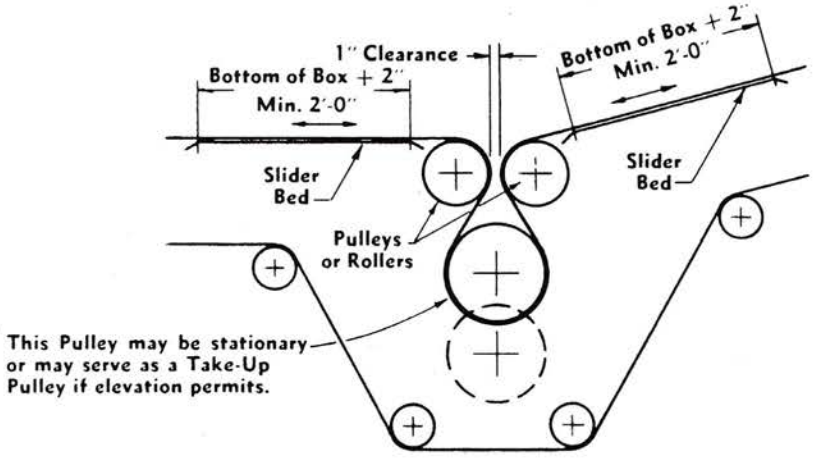
Used when incline exceeds 12½° for changing from incline to horizontal. Support or hanger should be as close to top of curve as possible.



SINGLE PULLEY BEND "ZB"

Used when incline is 12½° or less for changing from incline to horizontal. May also be used when incline exceeds 12½° if packages do not require gradual bend.



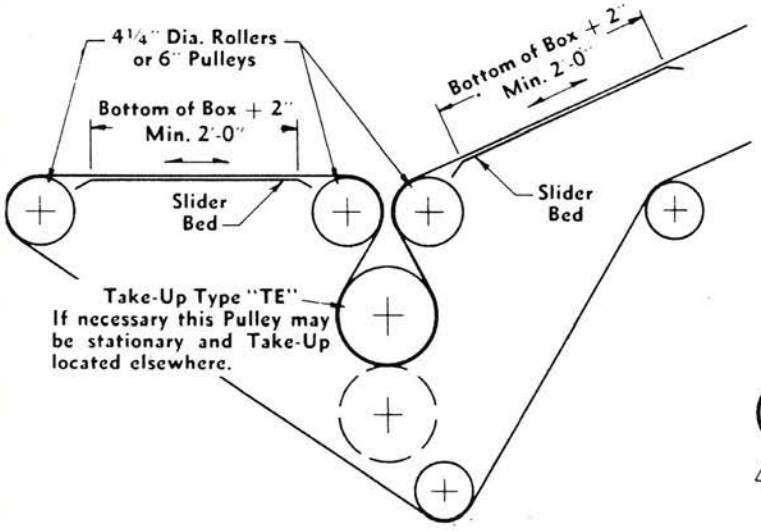


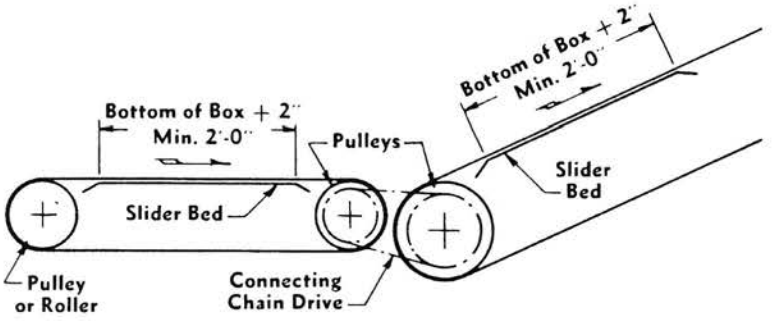
TWO PULLEY BEND "ZC"

Applicable for elevating only and when long packages are being handled. This type bend rarely gives ideal operation. Where the three pulley bend shown at the right can be used it is always recommended.

THREE PULLEY BEND "ZD"

May be used for elevating or lowering or when conveyor is reversible. Packages must be long enough to bridge gap at transfer point. Where take-up is located in three pulley bend it is designated as Type "TE"





BELT FEEDER "ZE"

Recommended for automatic loading when incline exceeds 12½°. Applicable for elevating or lowering or when conveyor is reversible.

BELT FEEDER "ZF"

For automatic loading where elevation will not permit using belt feeder "ZE". Applicable for either elevating or lowering but not recommended when conveyor is reversing.

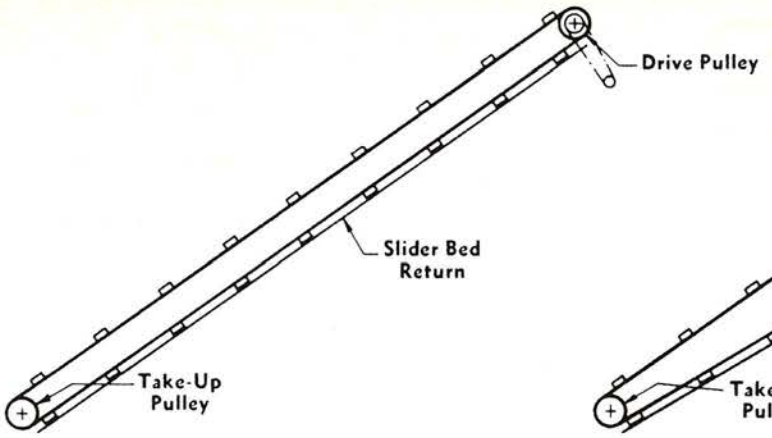


DIAGRAM "X"

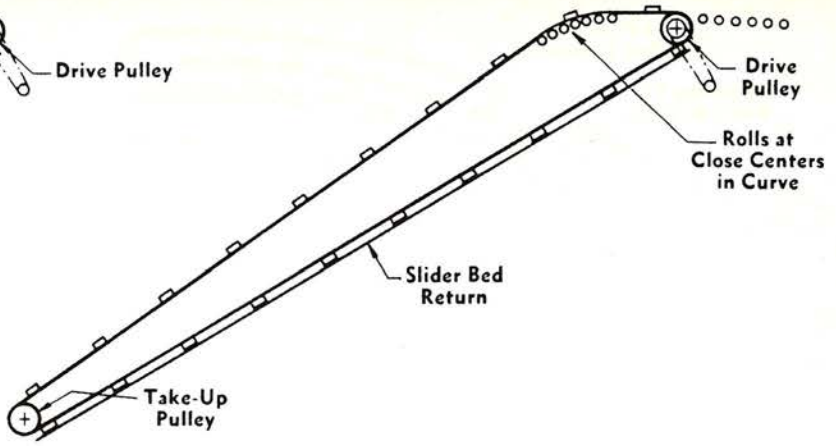
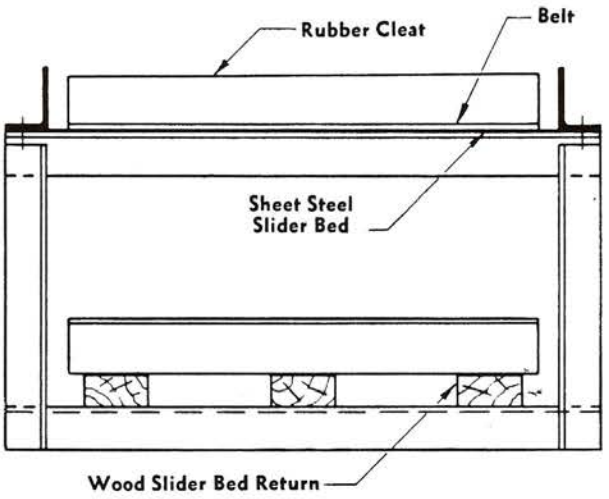
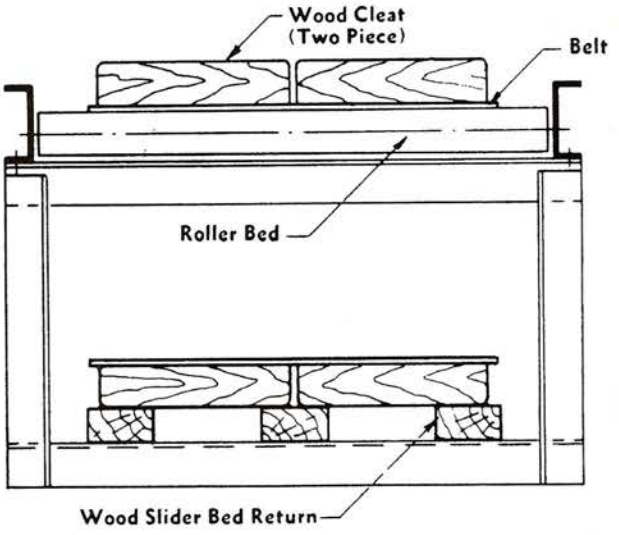


DIAGRAM "Y"

DIAGRAMS OF CLEATED BELT CONVEYORS

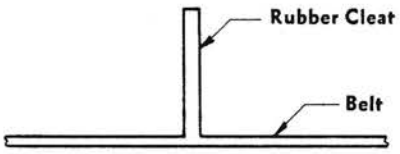


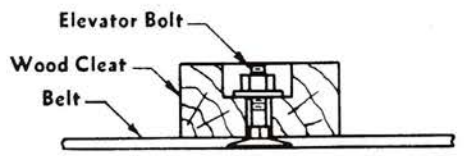
CROSS SECTION "A"



CROSS SECTION "B"

TYPICAL CROSS SECTIONS





METHOD OF ATTACHING CLEAT TO BELT

NOTES

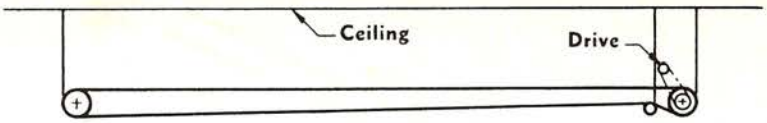
Cleated Belt Conveyors are recommended only where degree of incline is greater than maximum listed for Claw-top belting on Page 113. Angle of incline depends on field conditions and is limited to a maximum degree of slope only by possible tippage of package handled. Tippage can be controlled by increasing height of cleat; however, excessive height is objectionable with automatic discharge type as higher cleats increase the amount of gap between connecting conveyor. Especially objectionable with short packages.

Diagram "X" shows typical arrangement for manual loading and unloading. May be used for elevating or lowering or when conveyor is reversible.

Diagram "Y" shows typical arrangement for manual loading and automatic unloading. Recommended for elevating only.

Cleats are ordinarily either two-piece angle or two-piece wood block construction as shown in cross-sections "A" and "B". Cleats are split in center to permit operation over crowned pulleys.

Frame construction may be either sheet steel slider bed or roller bed depending upon type of package.



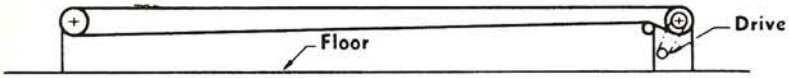


DIAGRAM "A"
Horizontal conveyor supported from floor.

DIAGRAM "B"
Horizontal conveyor hung from ceiling.

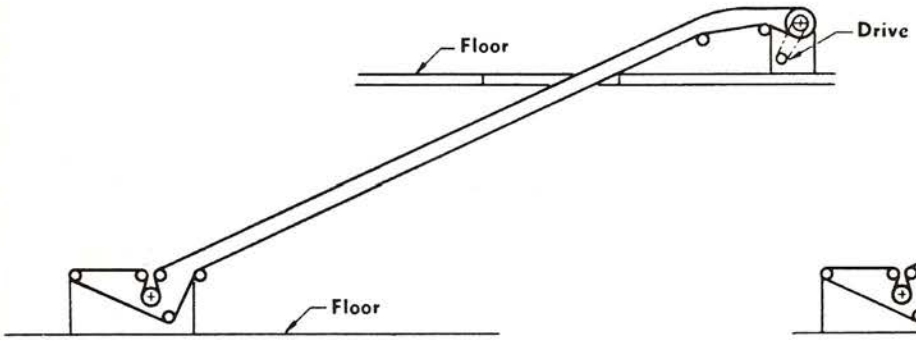


DIAGRAM "C"
Inclined conveyor from lower floor to upper floor.

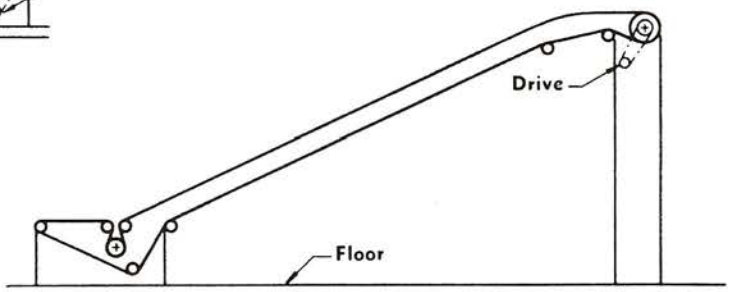


DIAGRAM "D"
Inclined conveyor with both ends supported from same floor.

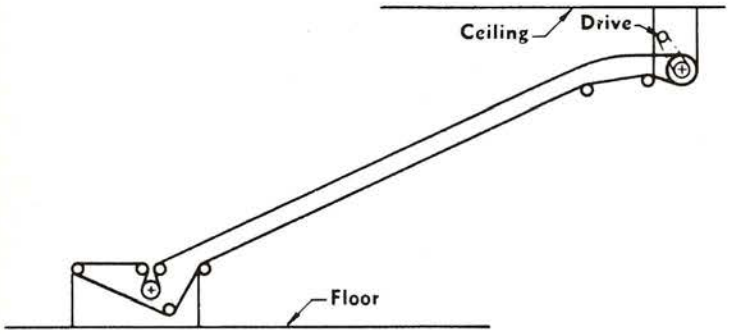


DIAGRAM "E"
Inclined conveyor from floor to ceiling.

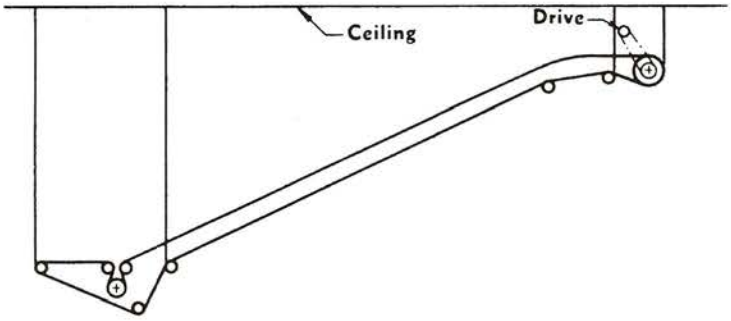


DIAGRAM "F"
Inclined conveyor with both ends hung from same ceiling.

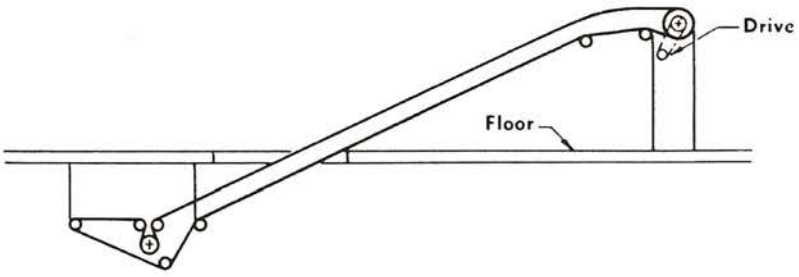


DIAGRAM "G"
Inclined conveyor from lower floor ceiling to upper floor.

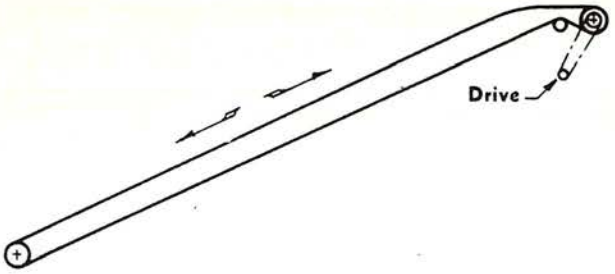


DIAGRAM "H"

Inclined conveyor for manual loading and automatic unloading. Can be used as declining conveyor with automatic loading and manual unloading.

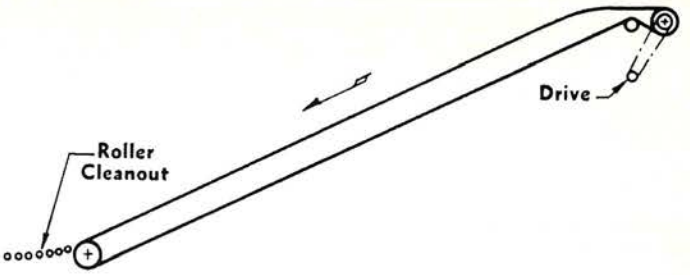


DIAGRAM "J"

Declining conveyor for automatic loading and with roller cleanout for automatic unloading. The roller cleanout limits application to average size and weight packages.

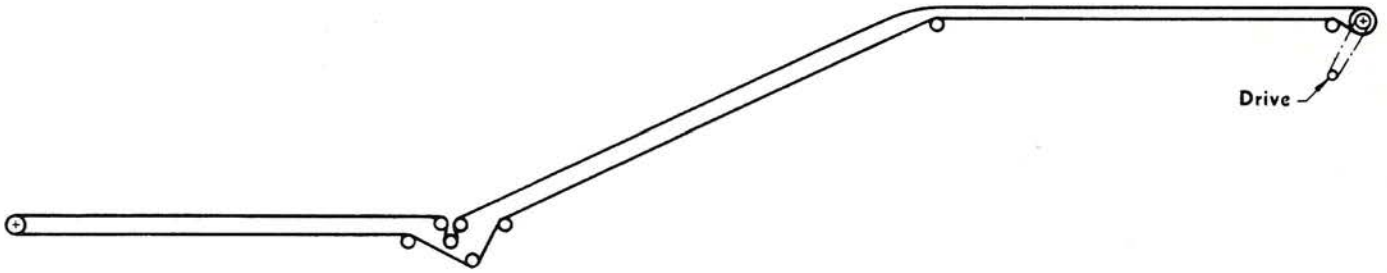


DIAGRAM "K"

Horizontal and inclined conveyor with continuous claw-top belt. The horizontal portion at either end of incline can be varied in length to suit conditions. Also permits automatic loading and unloading to connecting conveyors.

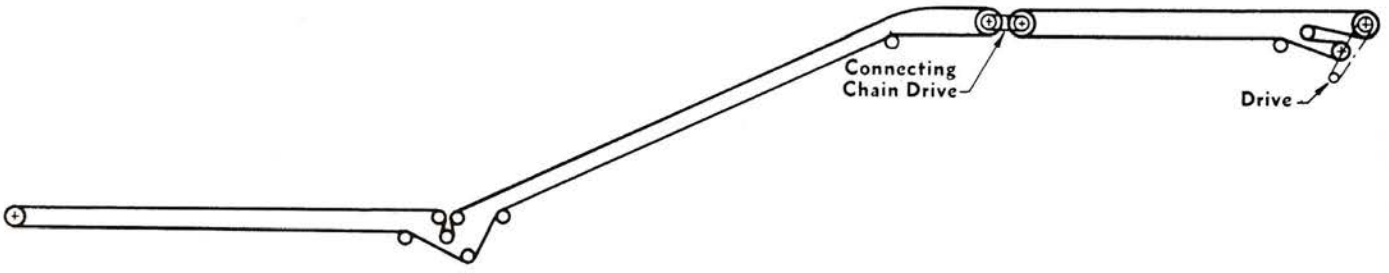
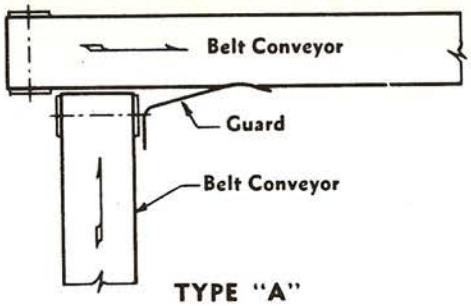


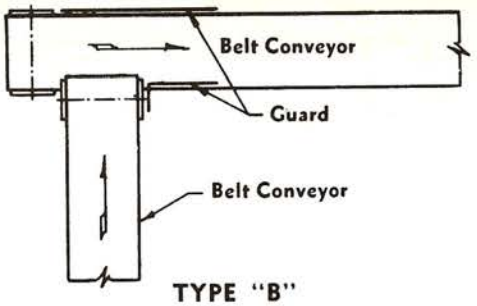
DIAGRAM "L"

Horizontal and inclined conveyor similar to Diagram "K" except with separate smooth-top belt on upper horizontal portion. Used where this portion requires deflecting to or from conveyor. Lower horizontal portion can also be separate smooth-top belt where necessary.



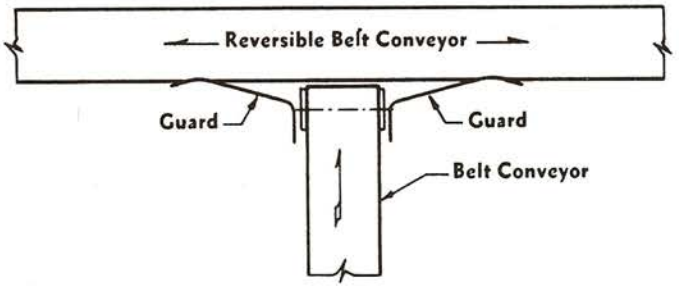
TYPE "A"

Right angle belt to belt Transfer with conveyors at approximately same elevation. Requires separation of packages on incoming conveyor. Recommended for packages of average proportions provided large enough to span gap at transfer point. Unusually long or odd shapes generally require Type "F" Transfer.



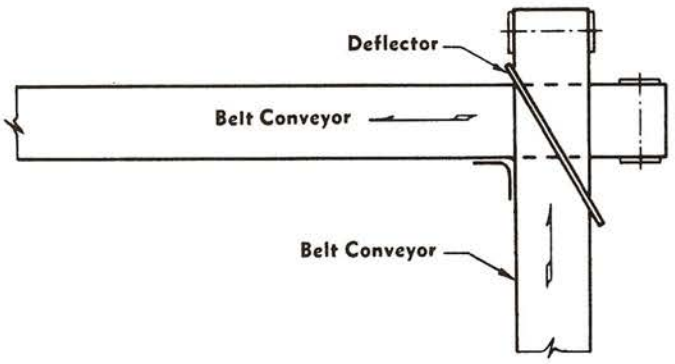
TYPE "B"

Right angle belt to belt Transfer with incoming conveyor overhanging receiving conveyor. For handling bundles, packages, or small items where tipping or dropping over transfer point is not objectionable.



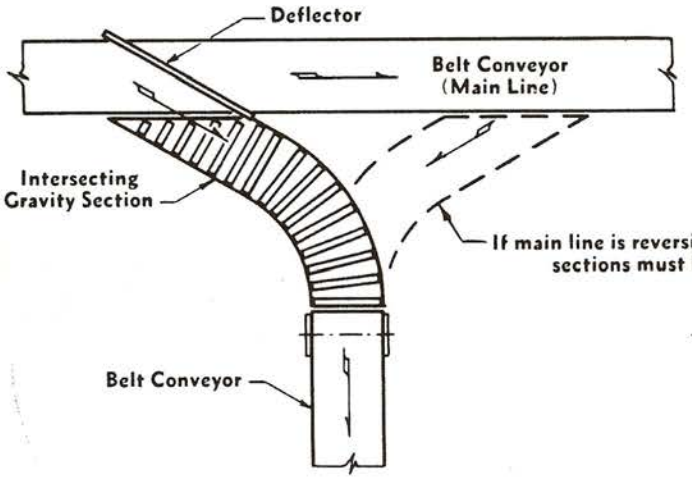
TYPE "C"

Right angle belt to belt Transfer similar to Type "A" except with reversible receiving conveyor.



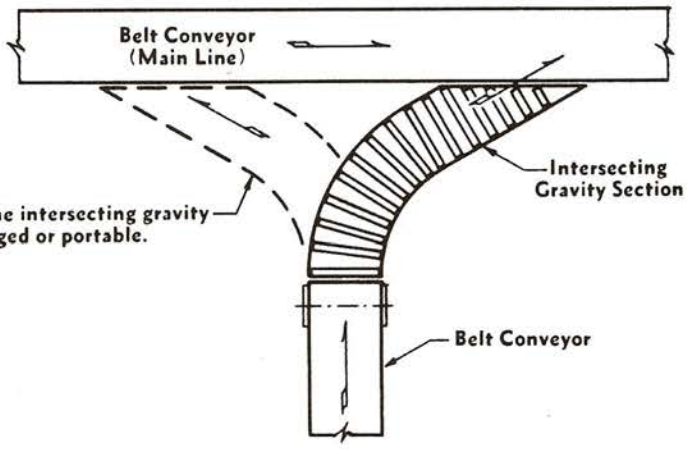
TYPE "D"

Right angle belt to belt Transfer with belts threaded across each other at approximately same elevation. For handling small items where gap or dropping at transfer point is objectionable.



TYPE "E"

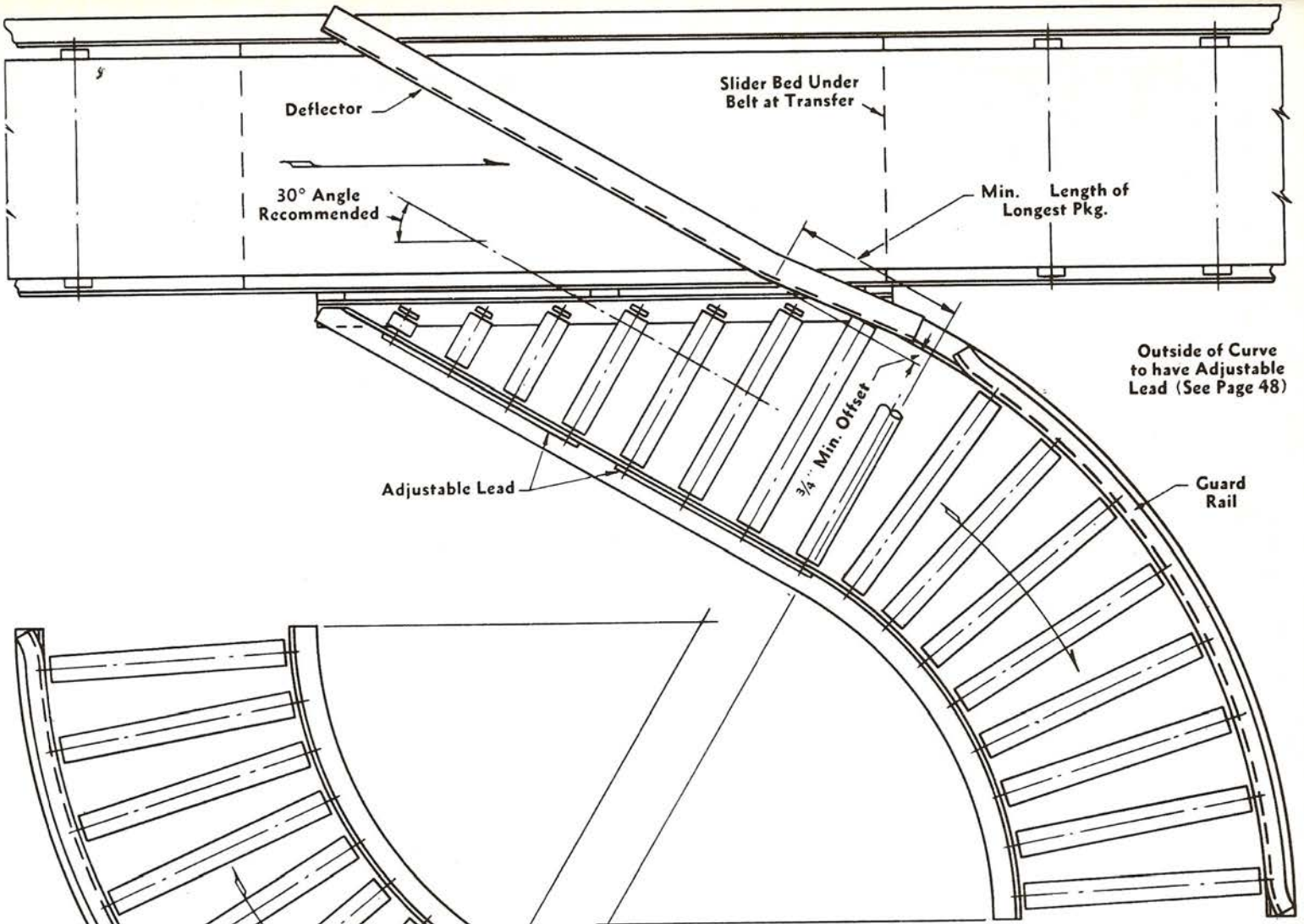
Intermediate belt unloading Transfer with Intersecting Gravity Section. Used for discharging from main line to spur line conveyor. Suitable for individual or continuous line of packages. Intersecting Gravity limits application to packages that will travel on Roller Conveyor. See enlarged detail Page 119.



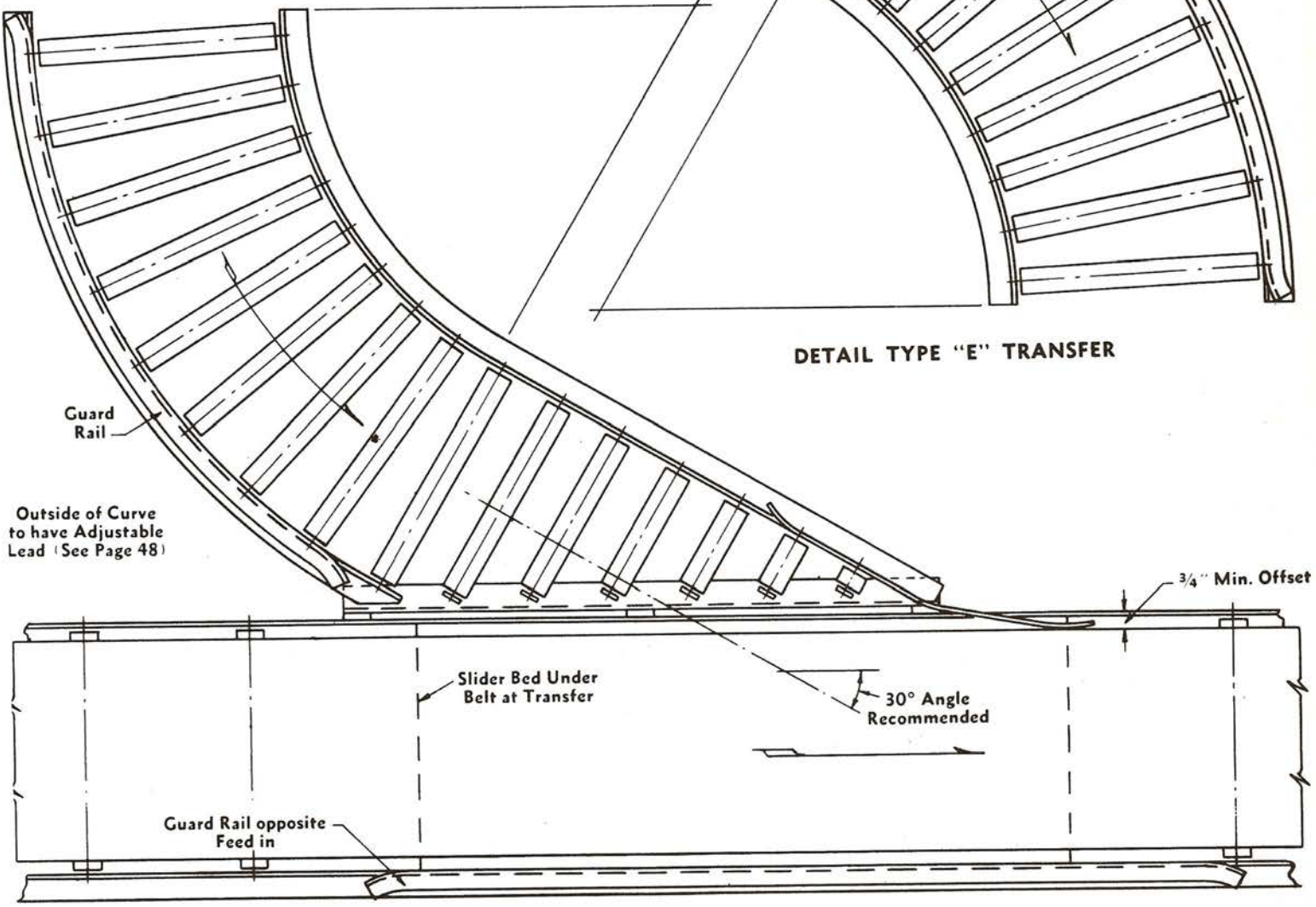
If main line is reversible, the intersecting gravity sections must be hinged or portable.

TYPE "F"

Intermediate belt loading Transfer with Intersecting Gravity Section. Used for receiving from spur line to main line conveyor. Suitable for individual or continuous line of packages. Also for unusually long or odd shapes not suitable for Type "A" Transfer. See enlarged detail Page 119.



DETAIL TYPE "E" TRANSFER



DETAIL TYPE "F" TRANSFER

General

Belt Conveyors have a broader field of usefulness than any other one type of power conveyor. They are particularly suited to conveying packages not adapted to Roller Conveyors, or where a constant height above floor level must be maintained. As the moving parts of Belt Conveyors are lighter than those of most power conveyors, they usually consume less power and can be operated at higher speeds. They are also suitable for operating at moderate inclines, preferably without cleats.

The types of construction shown on Pages 110 to 119 answer most requirements. Other types can be furnished to meet special conditions.

Top run of belt is usually supported on steel rollers with through shafts and appropriate ball bearings. This construction is particularly advisable for long conveyors and heavy loads. Where quiet operation is essential, it is recommended that grease packed or pressure lubricated bearings be used to eliminate the slight clicking noise usually present with dry ball bearings. Certain classes of service require roller, bronze, or oil-impregnated bearings. Slider beds give smoother travel but produce greater wear on belt and require more power to operate. The slider bed is usually of sheet steel, sometimes of hardwood.

Return belt is carried on steel rollers except when belt is cleated. Cleated belts require a slider bed return usually made of strips. (See Page 115.)

Belt Conveyors are usually either supported on floor or hung from ceiling with supports or hangers similar to Roller Conveyor types shown on Pages 51-B, 52 and 53.

Change of direction from horizontal to incline and vice versa can be accomplished with a single belt through the proper arrangement of snub pulleys or rollers. (See Page 114.)

Sometimes the return belt can also be used to advantage for conveying in opposite direction. Such an arrangement is known as a Two-Way Belt and is naturally more economical than two separate belts.

Belt Conveyors can also be made reversible. This makes it possible to return packages or materials to the starting point if desired. It also permits the handling of other materials which travel in the opposite direction but which can be moved conveniently at a different time. For exceptionally long or heavily loaded conveyors the intermediate drive and take-up unit shown on Page 110 is recommended.

Belting

The type of belting required depends upon the characteristics of commodity handled, prevailing atmospheric conditions, operations to be performed on conveyors, and any special conditions to be met.

Cotton belts can be used for light service, provided conveyor is comparatively short and is not exposed to excessive moisture. Canvas belts are most commonly used and are usually recommended with slider bed construction or where packages are deflected off of conveyor. Rubber belts are used where water or excessive moisture is present, and rubber belts with special rubber cover for handling rough and abrasive materials. For food products, hot objects, etc., special belts are required. Sometimes recommendations should be made only after careful study and experiment.

The maximum allowable incline for Belt Conveyors (without cleats) depends upon the size, weight, and type packages handled and the kind of belting used. See notes and table of maximum inclines on Page 113 for typical packages under average conditions. Special types of belting are available permitting satisfactory operation on inclines up to 30° under ideal conditions.

For inclines steeper than critical angle, cleats can be attached to belt. As previously mentiond, this type requires a slider bed return.

Woven wire or flat wire belting is used where fabric belts are not suitable because of the presence of moisture, excessive heat, acids, chemicals, etc. Such conditions exist when the conveyor passes through heat treating ovens, baking ovens, annealing lehrs, furnaces, baths, cooling units and other processing machinery. Both types are available in various mesh sizes and weaves to suit the requirements of each individual application.

Ends

Drives shown on Pages 102 and 103 and take-ups shown on Pages 104 and 105 are applicable to Belt Conveyors.

Inclined Belts

Belt Conveyors can be inclined or a combination of horizontal and inclined as shown by diagrams on Pages 116 and 117. For inclines requiring automatic loading without a Belt Feeder the 12½° Booster on Page 113 is recommended. Where greater incline is necessary the 25° Inclined Belt on Page 112 should be used whenever possible.

With heavy packages the roller bed construction on incline should have at least two rollers under package at all times. When lowering heavy loads the slider bed construction is generally used to retard travel.

Where desirable to prevent back-run or drift in the event of power failure a brake equipped motor can be furnished.

Bends for changing from incline to horizontal or from horizontal to incline are shown on Page 114. This sheet also shows Belt Feeders for automatic loading on inclines over 12½°.

Cleated Belt Conveyors are shown on Page 115.

Guards

Belt Conveyors can be furnished with carrying bed set low in frame or can be equipped with auxiliary angle or sheet steel guards similar to those furnished with Roller Conveyor. (See Page 48.) Guards may usually be omitted from Belt Conveyors operating at normal working height, but as a safety measure should always be furnished on overhead conveyors.

Long Spans

For long spans up to 25'-0", stair channel sections as shown on Roller Conveyor Page 72 are generally used. These are frequently required when supporting from roof trusses, wall brackets, or steel towers.

Work Tables

Work tables of any desired material (wood, sheet steel, monel metal, etc.) and width can be furnished on one or both sides of belt. They are bolted to structural framework, forming a part of conveyor unit. Often used on assembly and packing lines. (See Page 111.)

Right Angle Transfers

When transferring at right angles from the end of one Belt Conveyor to another, the two conveyors usually have separate drives. With Types "A", "B" and "D" Transfers shown on Page 118 a bevel gear connection can be furnished if necessary. If conveyors are at different levels a chain drive is required in addition to the set of bevel gears. The speed of the receiving conveyor should be at least 5% more than the feeding conveyor.

Deflectors

Deflectors are used for diverting packages to or from Belt Conveyors. Various regular types available are shown on Pages 138 and 139.

Hinged Belts

Hinged Belt Conveyors can be furnished where necessary to meet special conditions. Sometimes used to vary elevation of loading or discharge point or to lift conveyor out of way when not in use. Hinged portions are also used to allow passageway through the conveyor line.

The entire conveyor or only a portion of the conveyor may be hinged as required. Raising and lowering is usually accomplished with a chain and block manually operated. Can be electrically operated if necessary and short sections may be counterweighted.

Portable Belts

Belt Conveyors can be made portable by mounting them on wheels or swivel casters. Each unit is equipped with a self-contained drive. Where desirable to hold conveyor stationary while in operation, adjustable floor locks can be furnished.

Tracking Belt

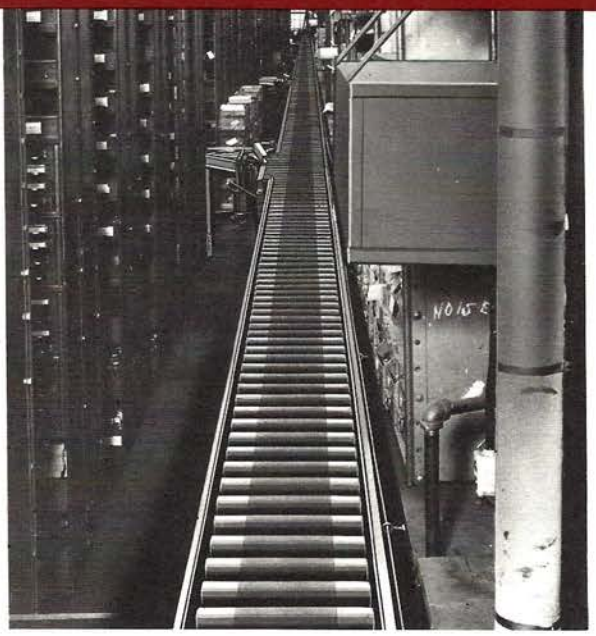
Start conveyor and track belt by use of the take-up screws. If this is not enough, shift head pulley slightly on its frame by means of the slotted holes in head shaft bearings. It is sometimes necessary to adjust the snub rolls, moving one end forward or backward, as required. The return rolls are mounted in adjusting plates for tracking return run of belt. This is particularly important so as to feed the belt onto take-up pulley properly.

After conveyor is lined up and running, it is necessary to keep close watch on the tracking of belt for a few days until the belt has taken its initial stretch and shape. It may then be necessary to repeat some of the adjustments described above.

LIVE ROLLERS

LIVE ROLLER CONVEYORS consist essentially of ordinary Roller Conveyors with rolls usually actuated from beneath by a continuous belt. The necessary driving friction is maintained by adjustable tension rolls (patented) under the belt. They are similar in application to Belt Conveyors but are limited to handling packages which will travel on Roller Conveyor. Chain Driven Live Roller Conveyors can be furnished to meet special conditions.

ABOVE: A Logan Live Roller Conveyor handling parts for electric motors and appliances between machine operations. Paralleled on either side by Roller Conveyor onto which the material is transferred while machine operations are performed.



ABOVE: Live Roller Conveyor serving storage racks for small machine parts. The parts are handled in tote pans which can be deflected to spur lines at several intermediate points.

RIGHT: Part of Logan system in wholesale drug warehouse. Live Roller takes tote boxes of filled orders to checkers. Overhead Belt and Roller Conveyor line handles mail and express shipments to an adjacent building.

On all Live Roller Conveyor views the shadow on surface of carrying rolls indicates position of belt below. Spacing of tension rolls is varied to suit the material handled or to meet special operating conditions.

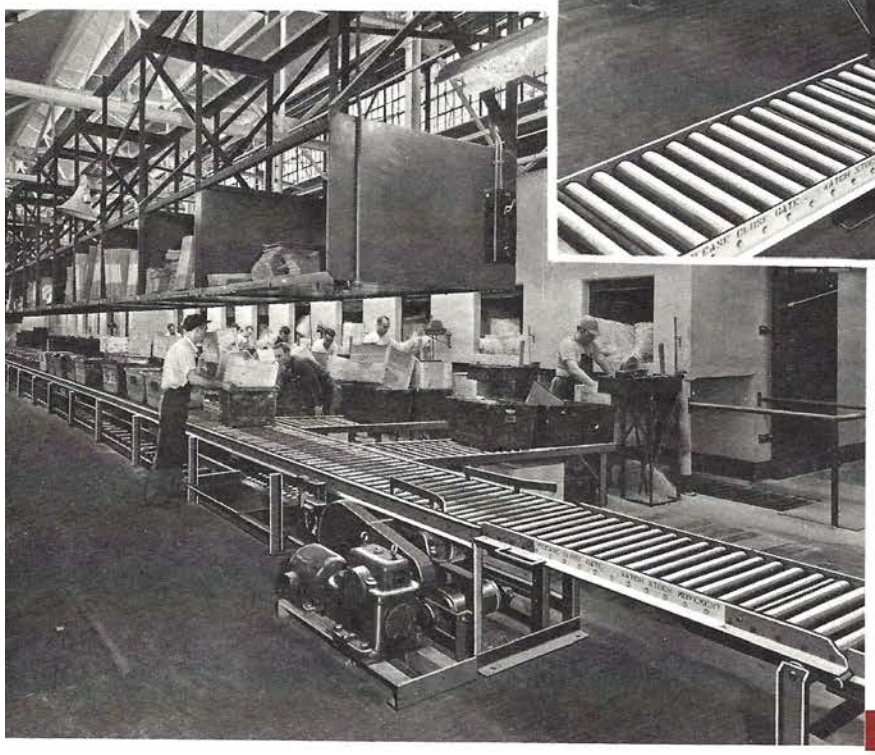
BELOW: Start of double deck conveyor in view at right showing construction of lower deck. The upper deck carries packages for parcel post and lower deck for express.

ABOVE: A Double Deck Live Roller Conveyor serving packing department for a manufacturer of perfumes and toilet articles. Both decks operate in same direction. This is accomplished by placing upper run of belt in contact with top surface of rolls and return run with underside of lower deck. The belt is placed along the side adjacent to windows.

RIGHT: Two-Way Double Deck Live Roller Conveyor in shipping department of a spraying equipment manufacturer. Orders in tote pans are brought in on top deck and pushed out on Roller Conveyor spur lines for packing. Lower deck driven by return run of belt takes the empty tote pans back to stock room.

LEFT: This Live Roller Conveyor handles partially assembled gasoline pumps from assembler's benches through testing stations and thence to painting. Units travel at a constant speed and at convenient working height. They can also be stopped on conveyor without excessive wear and tear on the belt.

RIGHT: Checking area for domestic shipments in shipping department of large wholesale drug warehouse. Roller Conveyor spur lines connect at each end to Logan Live Roller Conveyors which maintain convenient working height. Line in foreground takes checked shipments to loading dock.

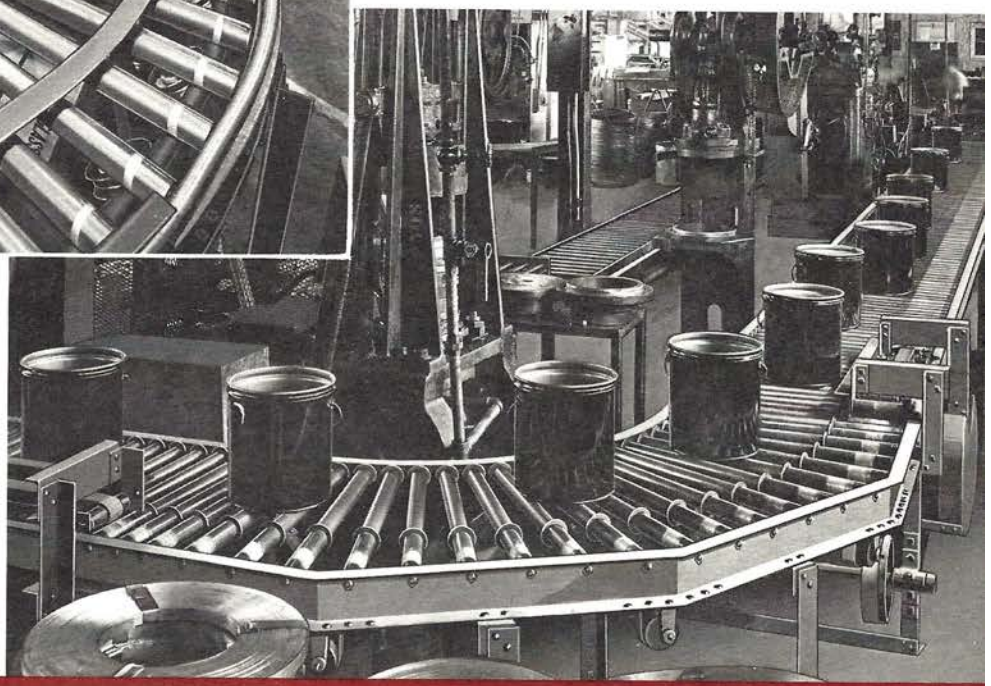


LEFT: Packing department for export shipments in warehouse mentioned above, served by Double Deck Live Roller Conveyor. Shipments are brought in on upper deck and shunted manually to Roller Conveyor spurs for packing and crating. Empty tote boxes are returned on lower deck and finished crates are forwarded to shipping platform by floor level Apron Conveyor under excelsior bins in rear.

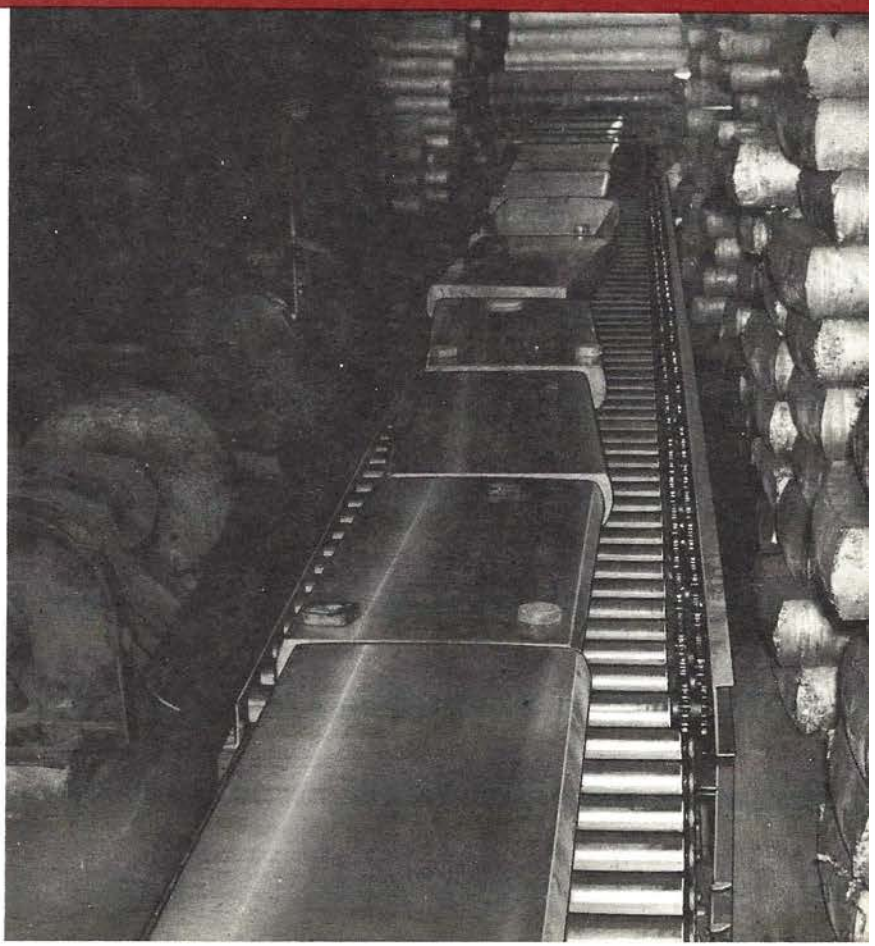
RIGHT: This Live Roller operates successfully at a downward slope of 12° lowering heavy and light shipments of electrical supplies. Jamming is eliminated and a sufficient space between packages is maintained to facilitate checking contents as packages pass the checker. Heavy or light packages or containers travel at the same controlled speed.

LEFT: Electric locomotive parts are progressively machined alongside Live Roller main line at right, passing on to assembly. Roller Conveyor "loop" permits special machine operations before rejoining main line.

LEFT: Live Roller Curve which connects two straight Live Roller Conveyors in distillery bottling plant. System is double deck and longer rolls are required in curve to allow clearance for packages on lower deck. Curve is driven from connecting straight conveyors.

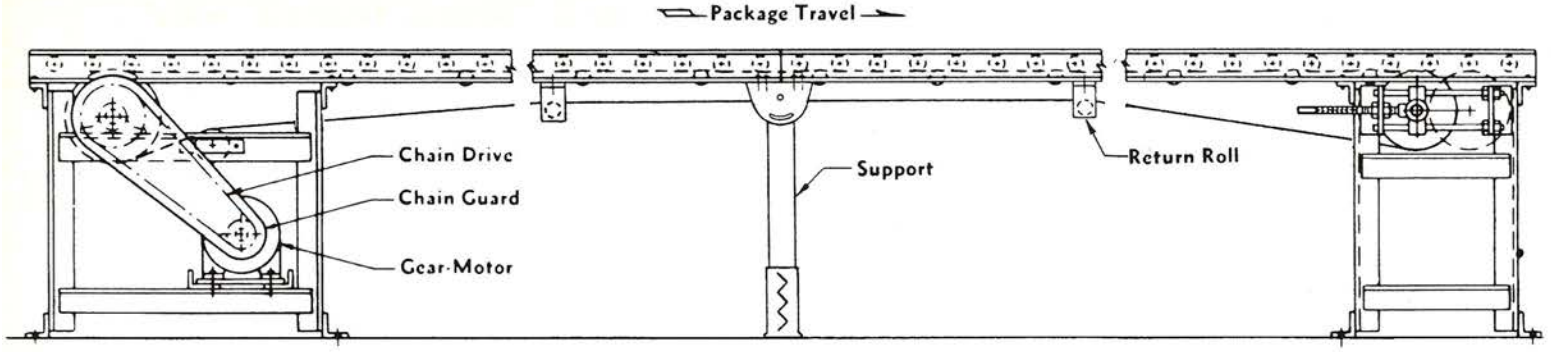


RIGHT: A Live Roller Curve is part of this system which handles metal pails through manufacturing operations. Curve connects two straight Live Roller Conveyors which have belts set to one side for protection from paint on pails. Mule Drives are used to power connecting rolls at both ends of curve. Rolls in curve have flanges which serve as guard rails and as a protection for belt.



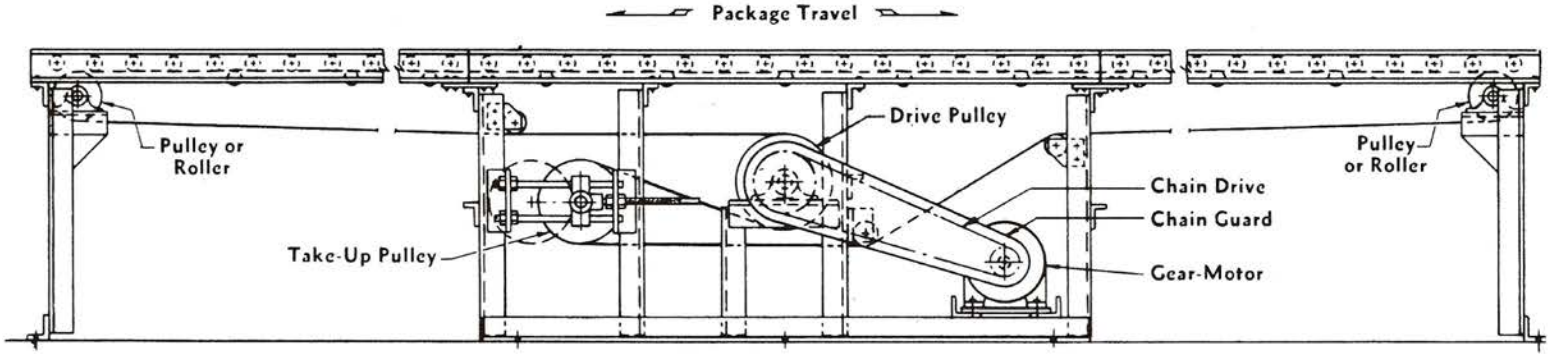
RIGHT: Logan Chain Driven Live Roller Conveyor handling billets from scalpers to reheat furnaces. System used in connection with operation for making clad aluminum. The drive is progressive chain type with sprockets welded to roll circumference. The Chain Driven type is used here due to heat which would be injurious to belting.

See Page 129 for General Arrangements of Chain Driven Live Roller Conveyors and for various types of chain drives. Also see notes on Page 135.



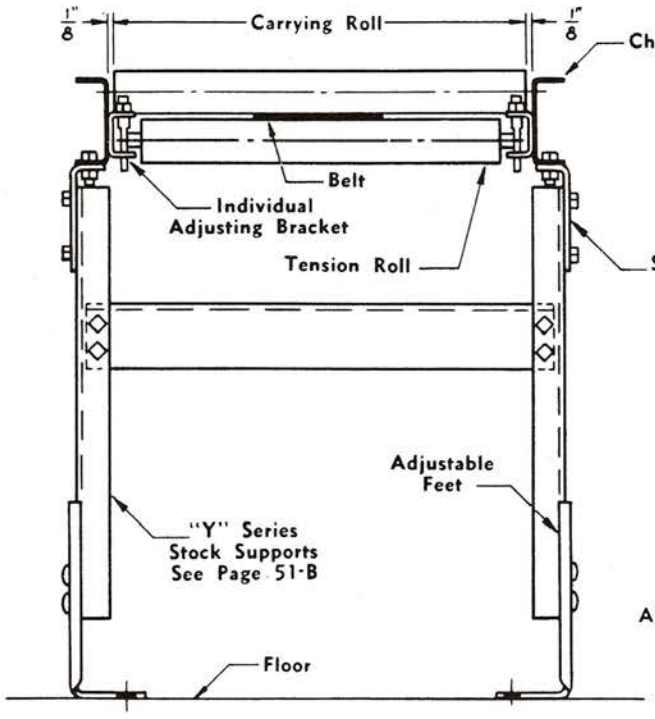
GENERAL ASSEMBLY OF LIVE ROLLER CONVEYOR

Showing drive at receiving end. This is normal construction for non-reversible Live Roller Conveyors.

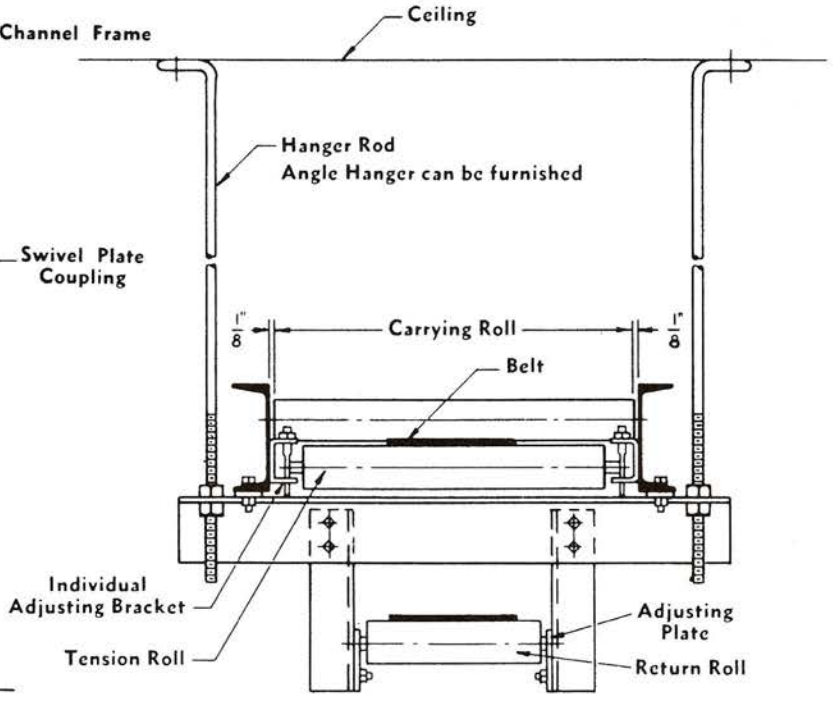


GENERAL ASSEMBLY OF REVERSIBLE LIVE ROLLER CONVEYOR

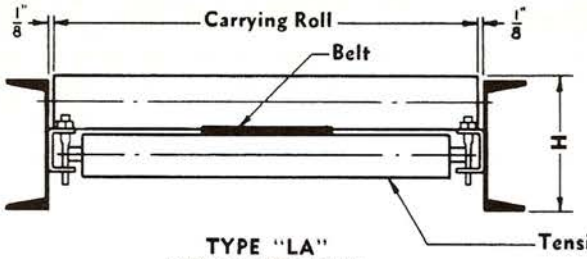
Showing Intermediate Drive and Take-up Unit. This construction is recommended for Reversible Live Roller Conveyors depending upon length of conveyor and load handled.



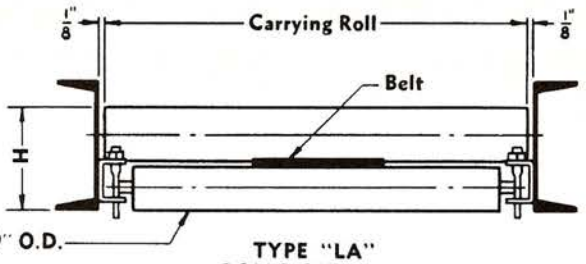
SUPPORT DETAIL



HANGER DETAIL



TYPE "LA"
ROLLS SET HIGH

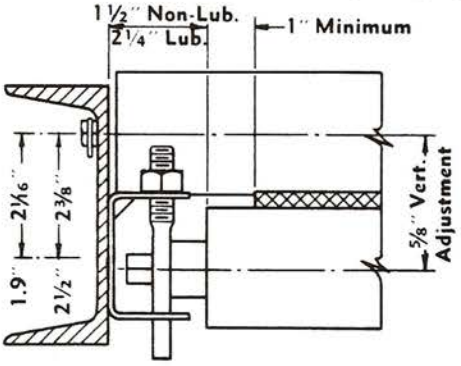


TYPE "LA"
ROLLS SET LOW

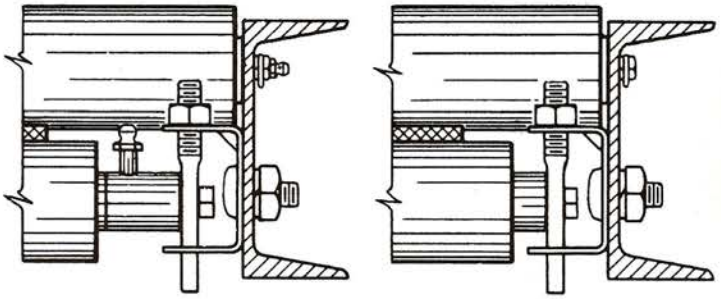
CROSS SECTIONS OF LIVE ROLLER CONVEYORS

SCHEDULE SHOWING TYPICAL MOUNTING OF CARRYING ROLLS WITH 1.9" O.D. TENSION ROLLS						
Frame Size	=3 Rolls 1.9" O.D.		=6 or =8 Rolls 2½" O.D.		=9 Rolls 2½" O.D.	
	H—Max.	H—Min.	H—Max.	H—Min.	H—Max.	H—Min.
4"—5.4# Channel	4⅛"	3 11/16"	4 7/16"		4¼"	
4"—10 Ga. Channel	4¼"	3 9/16"	4 9/16"		4 3/8"	
5"—6.7= Channel		3 13/16"	5 5/16"	4 7/16"	5 3/16"	4 7/16"
5"—10 Ga. Channel	5¼"	3 9/16"	5 9/16"	4 3/16"	5 3/8"	4 3/16"
6"—8.2= Channel		3 15/16"	6 3/16"	4 9/16"	6 3/16"	4 9/16"
6"—10 Ga. Channel	6¼"	3 9/16"	6 9/16"	4 3/16"	6 3/8"	4 3/16"

OMITTING "H" DIMENSION INDICATES CONSTRUCTION NOT PRACTICAL



DETAIL OF ADJUSTING BRACKET

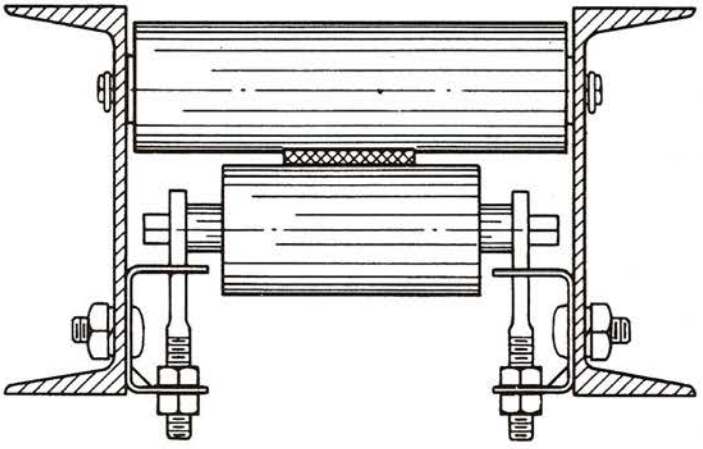


LUBRICATED NON-LUBRICATED

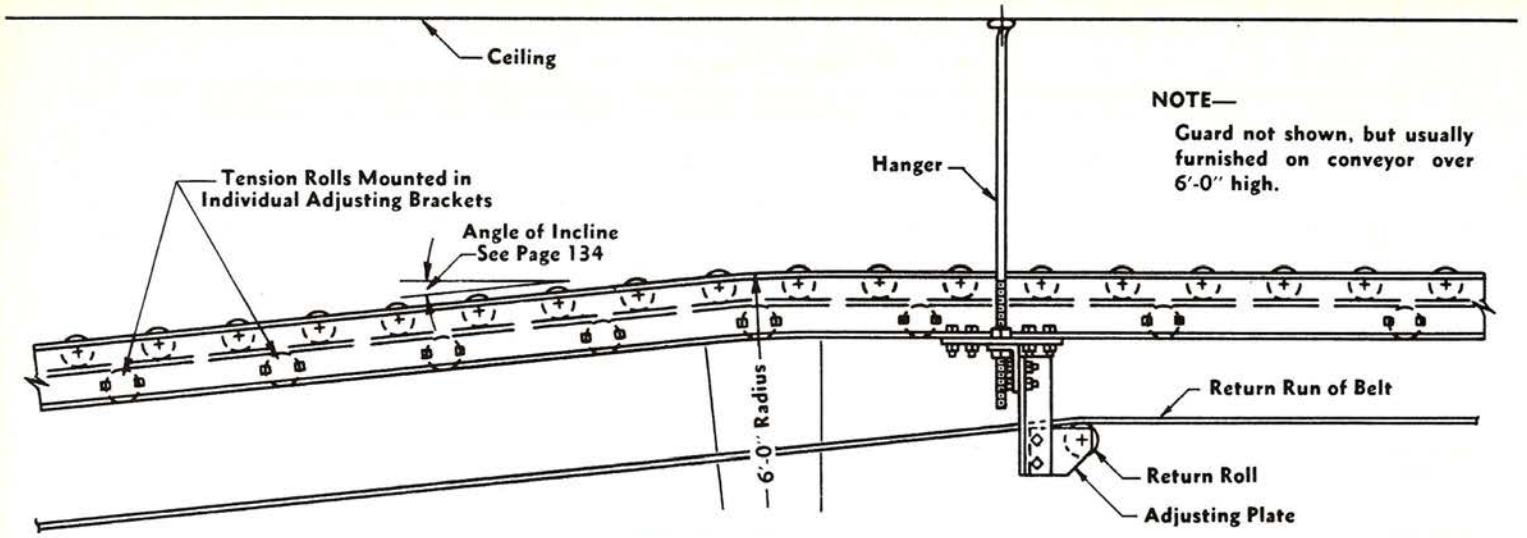
NORMAL BRACKET ASSEMBLY

The Logan Live Roller Adjusting Bracket is designed for vertical adjustment for increasing or decreasing the driving friction of belt against carrying rolls. Also designed for lateral adjustment permitting correction of belt misalignment. A minimum clearance of 1-1/16" between carrying rolls is required for making vertical adjustment with socket wrench. When closer spacing of carrying rolls is required the Inverted Bracket Assembly must be furnished.

The nut and bolt design of adjusting bar permits accurate setting to any degree of tension required. When adjusted for normal carrying duty the tension should be such that each carrying roll may be readily stopped by the thumb and forefinger of one hand. Greater tension may be applied for inclines, transfer points, etc. Never tighten tension rolls as a means of taking up slack in belt.

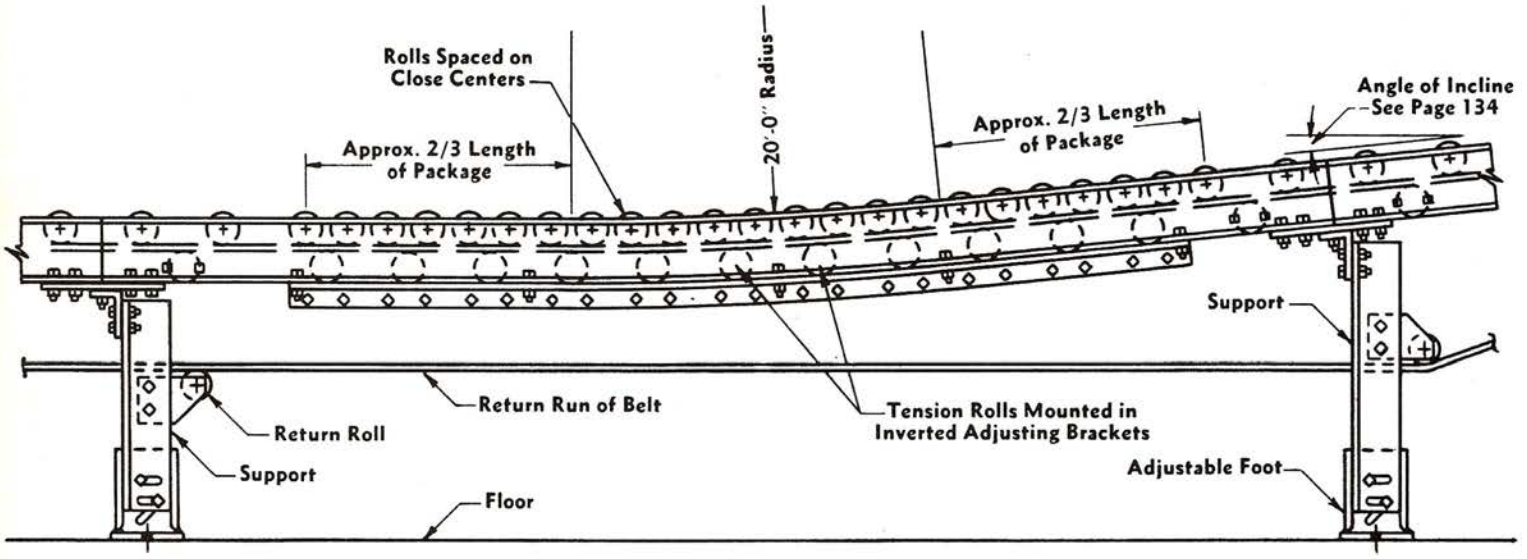


INVERTED BRACKET ASSEMBLY
For close spaced carrying rolls



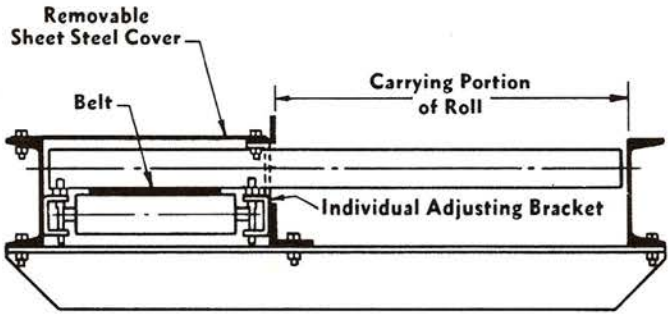
CONVEX BEND "ZA"

Package travel can be in either direction. Tension rolls in bend and on incline are mounted every other space to power all carrying rolls.



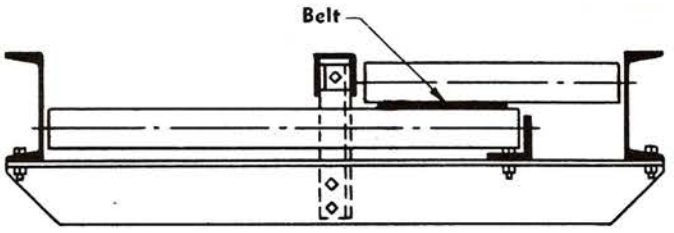
CONCAVE BEND "ZB"

Package travel can be in either direction. Tension rolls in bend and on incline are mounted every other space to power all carrying rolls.



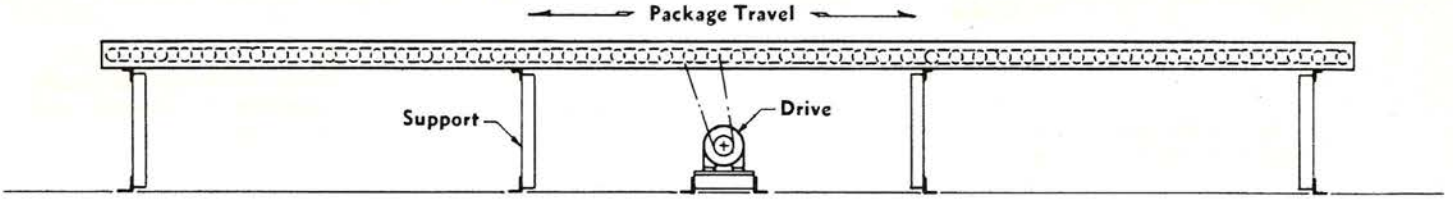
LIVE ROLLER CONVEYOR WITH BELT AT ONE SIDE

Used where articles handled might injure the belt due to heat or other conditions.



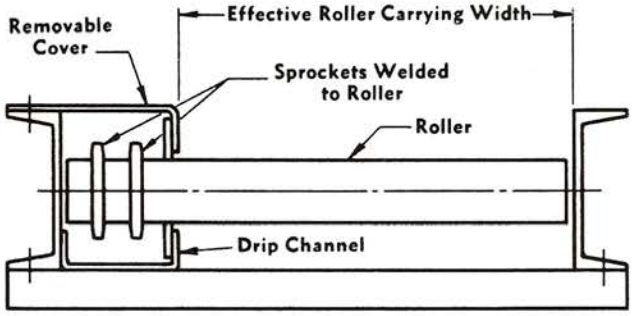
TWO-WAY TYPE LIVE ROLLER CONVEYOR

Used when articles handled must be carried in both directions at approximately the same elevation.

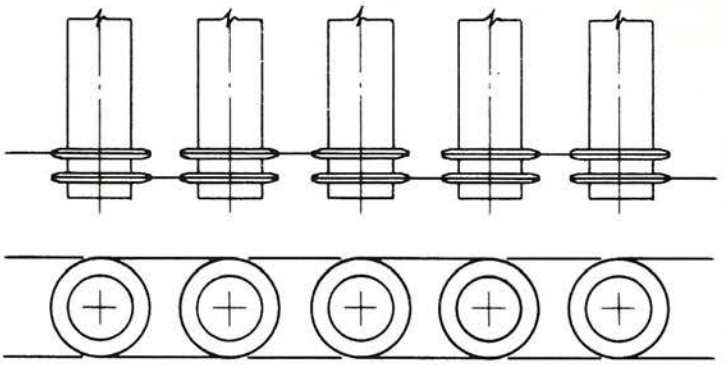


GENERAL ARRANGEMENT CHAIN DRIVEN LIVE ROLLER CONVEYOR

Showing Type "X" drive. Conveyor may be reversible.

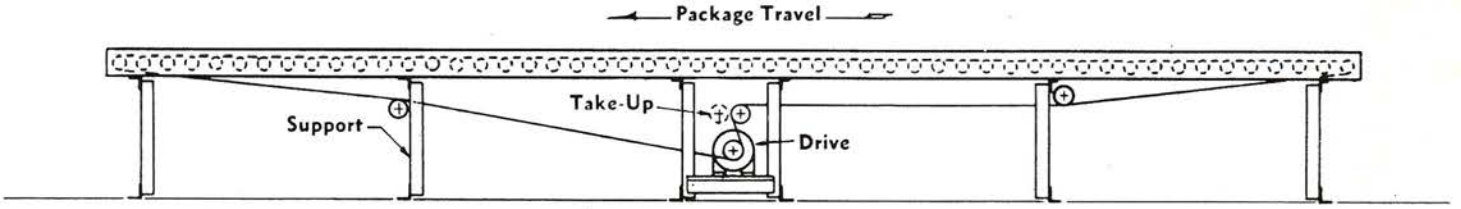


CROSS SECTION TYPE "LC-X"



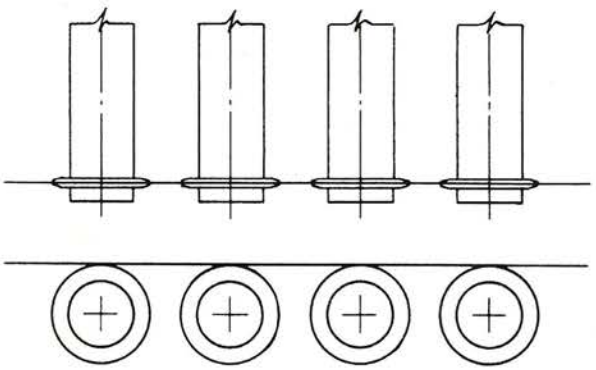
TYPE "X" DRIVE

Progressive Chains.



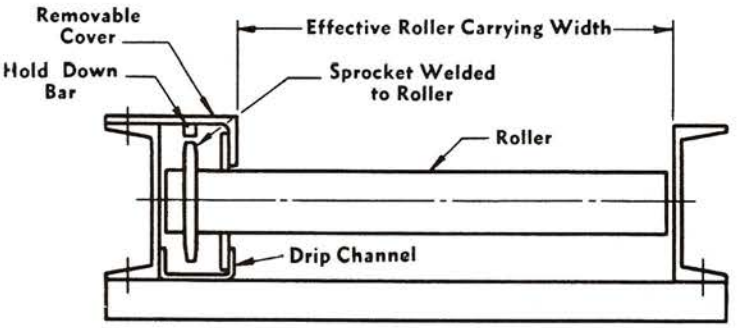
GENERAL ARRANGEMENT CHAIN DRIVEN LIVE ROLLER CONVEYOR

Showing Type "Y" Drive. Conveyor may be reversible.

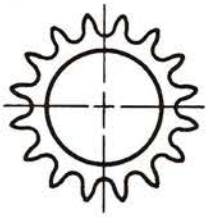


TYPE "Y" DRIVE

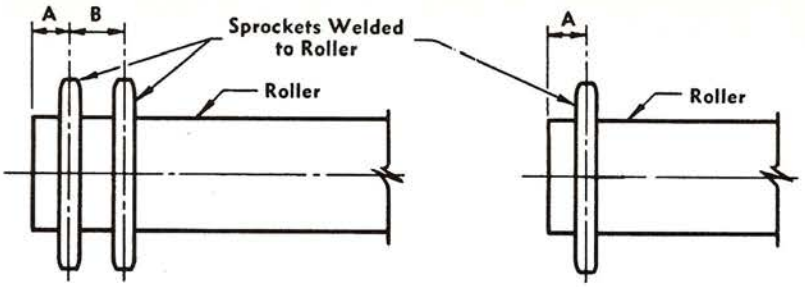
Continuous Chain.



CROSS SECTION TYPE "LC-Y"



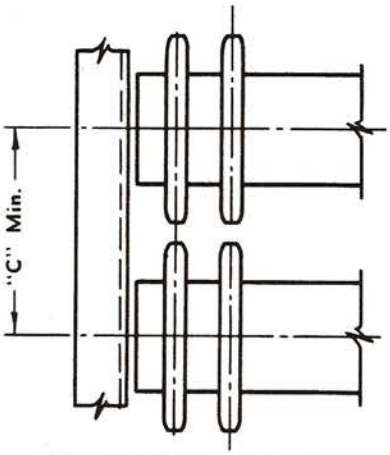
TYPE "X" DRIVE



TYPE "Y" DRIVE

MINIMUM SPROCKET TEETH FOR ROLLS							
Chain Size	Pitch	1.9"	2¼"	2½" or 2⁹⁄₁₆"	3½"	4¼"	5"
±40	½"	19	21				
±50	⅝"	16	18	19	24		
±60	¾"			17	21		
±80	1"			13	16	19	
±100	1¼"				14	15	17
±120	1½"					14	15

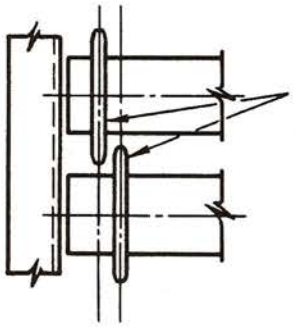
DIMENSIONS		
Chain Size	A=	B=
±40	¹³⁄₁₆"	1⅛"
±50	1"	1⅜"
±60	1⅛"	1¾"
±80	1¼"	2"
±100	1½"	2⅜"
±120	1½"	2¾"



MINIMUM CENTERS FOR TYPE "X" OR "Y" DRIVE

MINIMUM CENTERS "C" (In Inches)									
Chain Size	Number Teeth								
	13	14	15	16	17	18	19	21	24
±40							3⁴⁷⁄₆₄	4¹⁵⁄₆₄ *	
±50				4²³⁄₆₄ *		4⁶³⁄₆₄ *	4⁴³⁄₆₄		5³⁹⁄₆₄
±60					5³⁹⁄₆₄ *			6²³⁄₆₄ *	
±80	5³¹⁄₆₄			6⁶³⁄₆₄ *			7³¹⁄₆₄		
±100		7¹⁵⁄₃₂	8³⁄₃₂ *		8³⁄₃₂				
±120		8³¹⁄₃₂	9²³⁄₃₂ *						

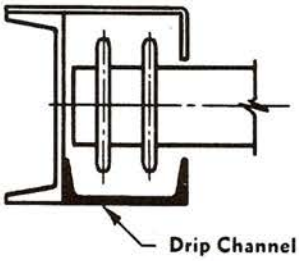
*Centers thus indicated can be decreased ½' chain pitch by use of offset connecting link.



Staggered sprockets driven by two single strands of chain can sometimes be used where very close centers are required.

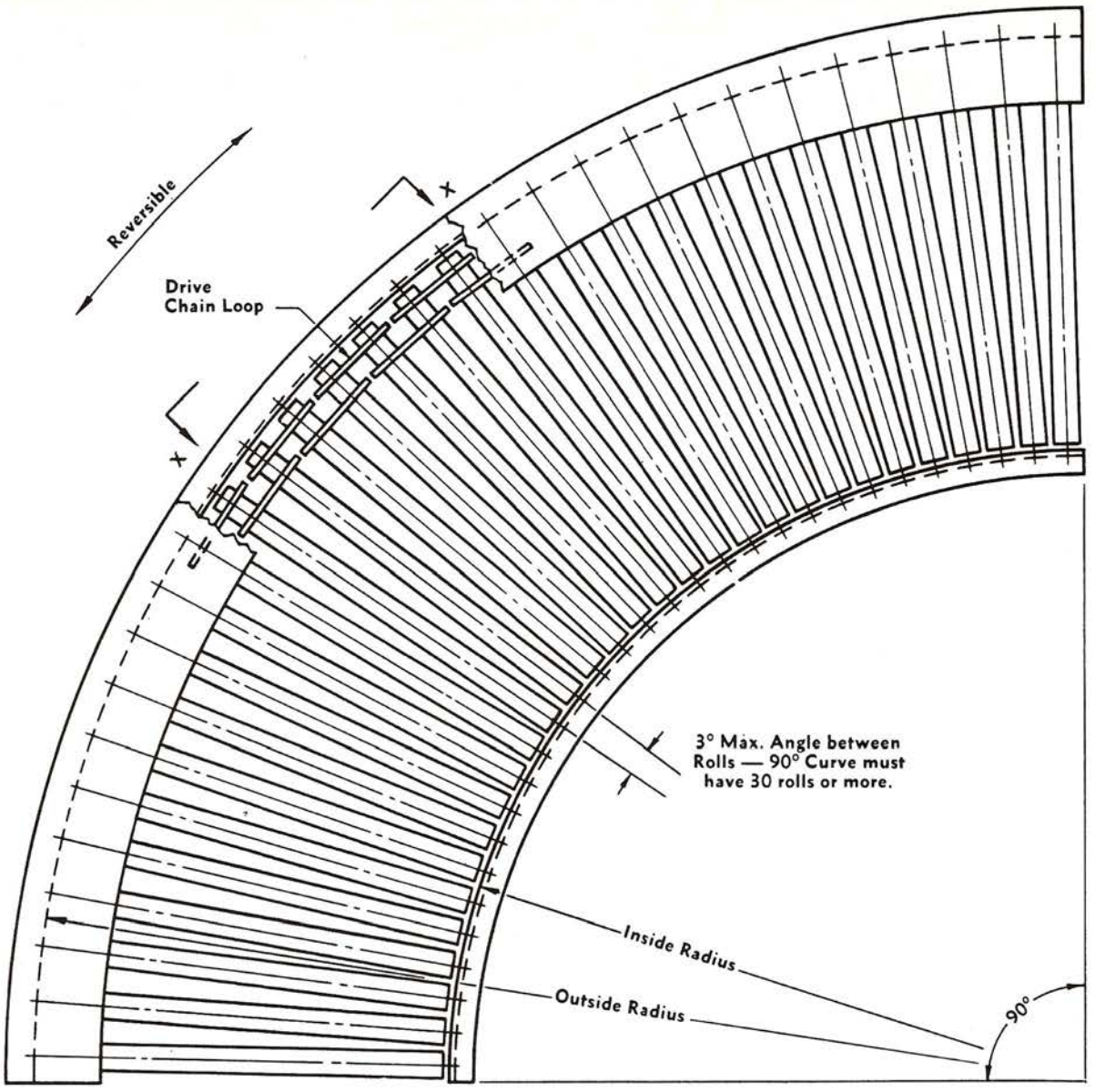
TYPE "Y" MODIFIED

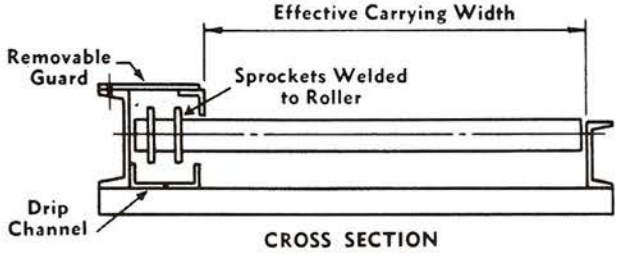
Cross section would be similar to type LC-Y on Page 129 with a double hold down necessary.



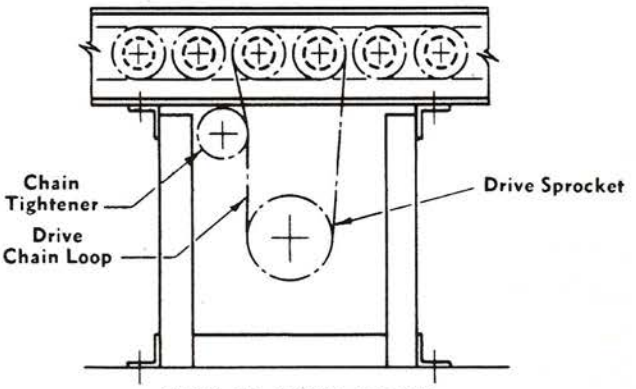
Drip channels are usually furnished to prevent oil on chains from dripping onto floor.

CHANNEL SIZES	
Chain Size	Channel
±40	3"
±50	4"
±60	4"
±80	5"
±100	6"
±120	7"





CROSS SECTION



VIEW OF DRIVE AT X-X

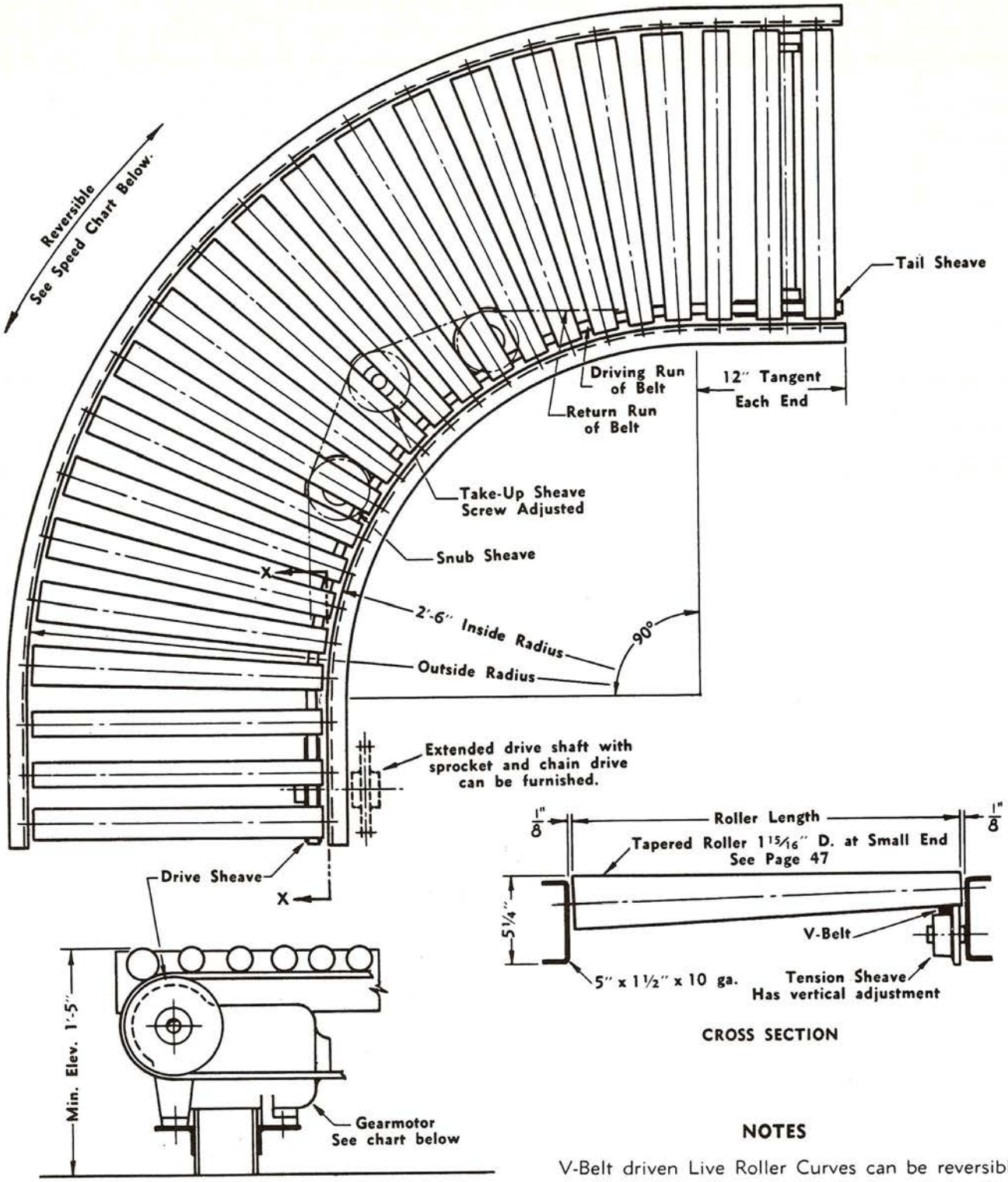
For types of drives available see Pages 102 and 103.

NOTES

Chain driven Live Roller Curves can be reversible and are furnished with separate drive or driven from connecting conveyor.

Recommended for heavier duty service than the V-Belt type on Page 132. Maximum load handled determined by size of rolls and chains.

Special curves can be made for any degree required and with tangent on ends



SECTION X-X

CROSS SECTION

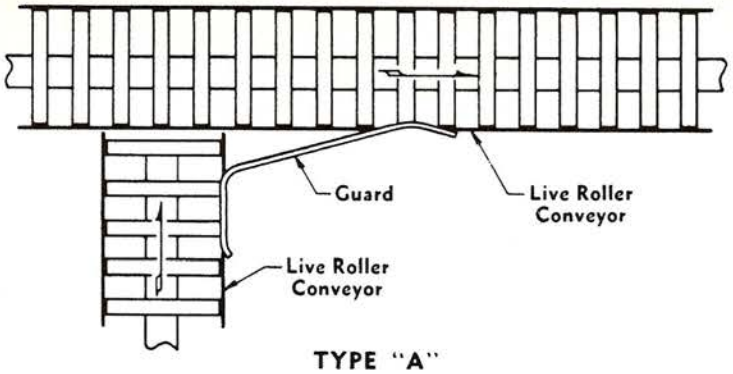
GEARMOTORS FOR L. R. CURVE						
Speed	1/3 HP Gearmotor			1/2 HP Gearmotor		
R.P.M.	16	19	24	29	36	48
F.P.M.	36	43	54	65	81	108

NOTES

V-Belt driven Live Roller Curves can be reversible and are furnished with separate drive or driven from connecting conveyor.

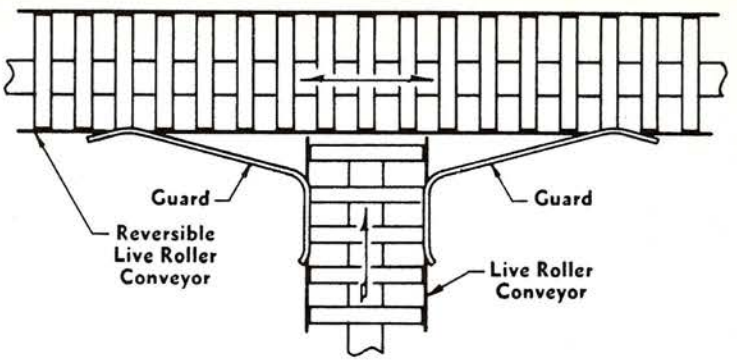
Recommended for normal conditions and with unit loads not exceeding 125 pounds or total load on curve of 300 pounds maximum.

Special curves can be made for any degree required or with longer straight tangent on ends.



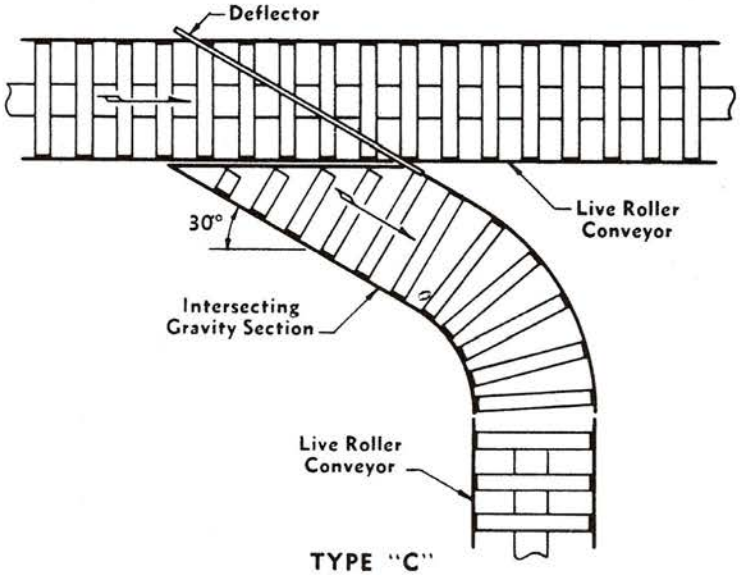
TYPE "A"

Right angle Live Roller to Live Roller Transfer. Requires separation of packages on incoming conveyor. Unusually long or odd shaped packages generally require Type "C" or "D" Transfer.



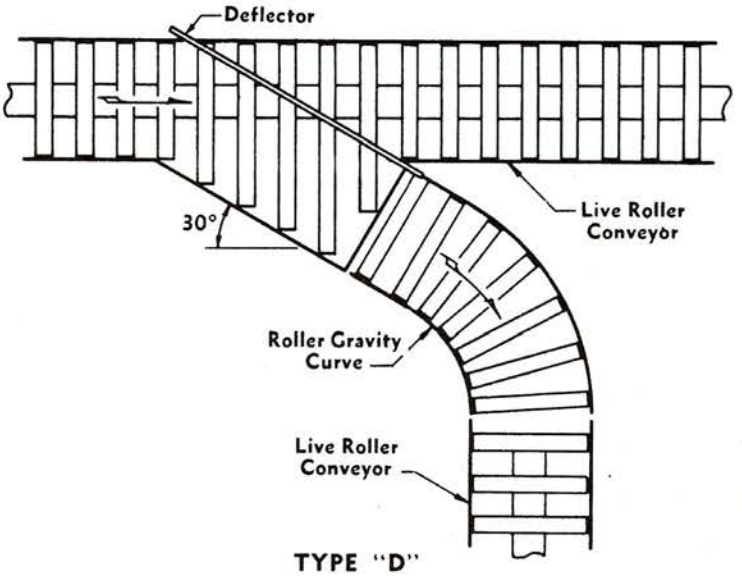
TYPE "B"

Right angle Live Roller to Live Roller Transfer similar to Type "A" except with reversible receiving conveyor.



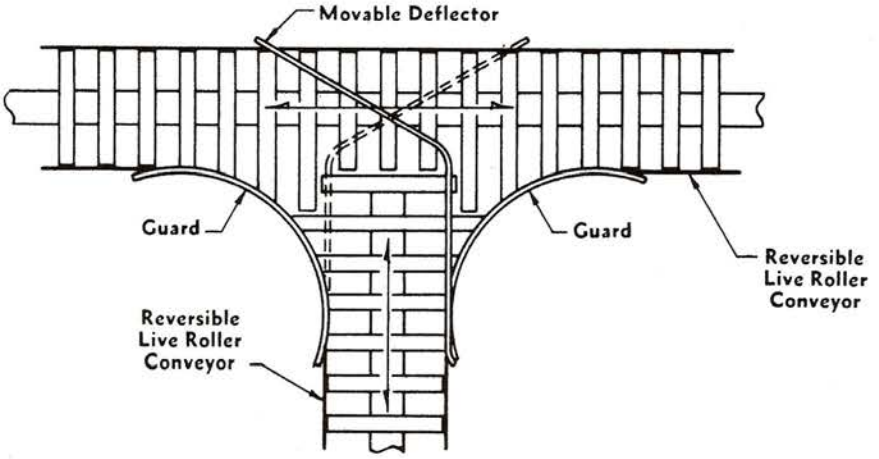
TYPE "C"

Intermediate unloading Transfer with Intersecting Gravity Section. Used for discharging from main line to spur line conveyor. Suitable for individual or continuous line of packages. Also for unusually long or odd shapes not suitable for Type "A" Transfer. When loading in opposite direction the deflector is omitted.



TYPE "D"

Similar to Type "C" Transfer except with positive unloading section. Less gap at transfer point is particularly desirable for small packages. When loading in opposite direction the deflector is omitted.



TYPE "E"

Right angle Live Roller to Live Roller Transfer for reversible service. All rolls are powered for positive transfer. Suitable for individual or continuous line of packages. Sketch shows four-way operation and a similar construction can be furnished for two-way operation.

General BELT DRIVEN TYPE

The Belt Driven Type Live Roller Conveyor (patented) consists essentially of a carrying bed of rolls actuated from beneath by a continuous belt. The necessary driving friction is maintained by tension rolls under the belt which are adjustable both vertically and laterally.

Packages handled are in general limited to such types as will travel on Roller Conveyor. However, due to the positive drive and controlled speed, the Live Roller permits handling a wider range of types and weights of packages on the same unit. In other respects, the characteristics of Live Roller Conveyors are quite similar to those of Belt Conveyors. Live Rollers have this distinct advantage – packages may be allowed to accumulate at any point on the conveyor and the rolls will simply turn under the package without damaging it or causing excessive friction and wear on the belt.

Unless the nature of packages requires very close roll spacing, a Live Roller Conveyor usually approximates the cost of a Belt Conveyor designed for the same work. The amount of belt tension required to actuate the rolls is remarkably small and the Logan patented feature permits quick and easy adjustment of tension rolls while conveyor is running. When tension is properly adjusted for average conditions, a driven roll may be readily stopped by the thumb and forefinger of one hand. This means low power consumption and long life to belt and bearings.

The traction between carrying rolls and belt can be entirely released at any point and for any distance along conveyor by simply lowering the tension rolls or omitting them entirely in that area. This creates a dead zone where packages will stop, and can be used to advantage where it is desired to inspect or perform some other operation on the article conveyed.

Live Roller Conveyors are usually either supported on floor or hung from ceiling with supports or hangers similar to Roller Conveyor types shown on Pages 51-B, 52 and 53.

Live Rollers can be used for elevating on slopes up to 7° depending upon conditions and type of package handled. Slope for lowering can be at slightly greater angle if necessary. Live Rollers can be made reversible and several types of Two-Way units furnished. (See Page 128).

Rollers

The proper type, size, and spacing of carrying rolls are determined as for Roller Conveyors. There should be a minimum of three carrying rolls under package at all times.

Tension rolls are usually spaced so as to provide a minimum of two driven or "live" rolls under package at all times. For average packages on horizontal conveyors, tension rolls are usually located in every third space between carrying rolls, which means that two carrying rolls out of every three are powered. For inclined conveyors, tension rolls are usually located every second space in order to power every carrying roll. Tension rolls are mounted in individual adjusting brackets, the vertical adjustment increasing or decreasing the driving friction of belt against carrying rolls; the lateral adjustment permitting correction of belt misalignment. See detail of adjusting bracket on Page 127.

The carrying, tension, and return rolls are all the regular ball bearing type with through shafts and bearings in ends of rolls as used in Roller Conveyor. Where quiet operation is essential, it is recommended that grease packed or pressure lubricated bearings be used to eliminate the slight clicking noise usually present with dry ball bearings.

Frames

Live Roller Conveyors are furnished with either structural channel or formed channel frames and designated as Type "LA". See Page 127 for typical frame sizes and mounting of carrying rolls. Special frames can be furnished if necessary to meet special conditions.

Guards

Live Roller Conveyors can be furnished with carrying rolls set low in frame or can be equipped with auxiliary angle or sheet steel guards similar to those furnished with Roller Conveyor. (See Page 48.) Guards may usually be omitted from Live Roller Conveyors operating at normal working height, but as a safety measure should always be furnished on overhead conveyors.

Belting

The belting recommended is the rubber friction surface type. This belting has a more uniform thickness and is less affected by atmospheric conditions. The grade of belting and kind of rubber treatment required depend upon the commodity handled and prevailing operating conditions. A canvas stitched belt with special treatment can be furnished if requested.

Ends

Drives shown on Pages 102 and 103 and take-ups shown on Pages 104 and 105 are applicable to Live Roller Conveyors.

As the actuating belt contacts the bottom of carrying rolls, the movement of belt is in opposite direction to travel of packages. The drive is therefore located at the receiving end of conveyor wherever possible and the take-up at discharge end.

The intermediate drive and take-up unit shown on Page 126 is usually recommended for Reversible Live Roller Conveyors. This construction is also frequently used when handling small packages. The small fixed end pulleys permit a minimum amount of dead space when discharging to or from connecting conveyors.

Transfers

Typical arrangements for transferring to or from Live Roller Conveyors are shown on Page 133. When transferring between two Live Roller Conveyors the speed of receiving conveyor should be at least 5% more than the feeding conveyor.

Deflectors

Most packages may be deflected from Live Roller Conveyors even more readily than from Belt Conveyors due to the packages not being in contact with the belt. This eliminates sliding packages across the surface of the belt itself which might damage the belt and also eliminates the tendency to force the belt to one side of the conveyor. They also lend themselves more readily to automatic operations than Belt Conveyors due to the narrow belt used which allows room for operating fingers or devices to project up through the carrying rolls. Various regular types of deflectors available are shown on Pages 138 and 139.

Two-Way Conveyors

Sometimes the return belt is used to drive a return line of carrying rolls. Such an arrangement is known as a Double Deck Two-Way Live Roller. Return belt can also be used as a Combination Conveyor in which one run of belt is used as a Live Roller Conveyor and other run is used as a Belt Conveyor. With this Combination Conveyor the travel on both runs is in same direction.

Since carrying and tension rolls revolve in opposite directions, the two-way arrangement shown at lower right on Page 128 provides a simple means of conveying in opposite directions on the same conveyor. However, as individual tension roll adjustment must be sacrificed, the operating conditions are not ideal.

Curves

For connecting two Live Roller or other power units set at an angle, Roller Conveyor Curves or Transfers afford the simplest and most economical means where practical. But if conditions require, Live Roller Curves can be furnished. These are usually the Belt Driven Type shown on Page 132. Where necessary, a Chain Driven Type as shown on Page 131 can be used.

Portable Live Rollers

Live Roller Conveyors can be made portable by mounting them on wheels or swivel casters. Each unit is equipped with a self-contained drive. Where desirable to hold conveyor stationary while in operation, adjustable floor locks can be furnished.

Tracking Belt

Start conveyor and if belt does not run true because any of the tension rolls are not at right angles to frame, these may be adjusted horizontally by means of slotted holes in adjusting brackets. Finish tracking belt by use of the take-up screws. If this is not enough, shift head pulley slightly on its frame by means of the slotted holes in head shaft bearings. It is sometimes necessary to adjust the snub rolls, moving one end forward or backward, as required. The return rolls are mounted in adjusting plates for tracking return run of belt. This is important so as to feed the belt onto take-up pulley properly.

With conveyor running, adjust tension rolls vertically for proper tension. Once properly adjusted the tension rolls should be left alone. Never tighten tension rolls as a means of taking up slack in belt.

After conveyor is lined up and running, it is necessary to keep close watch on the tracking of belt for a few days until the belt has taken its initial stretch and shape. It may then be necessary to repeat some of the adjustments described above.

CHAIN DRIVEN TYPE

General

There are occasional handling conditions where a Live Roller Conveyor is desirable but where the Belt Driven Type is not applicable. The presence of excessive heat or excessive grease, for instance, would have a detrimental effect on belting. Chain Driven Live Rolls are recommended for such conditions. Chain Driven Live Roller Conveyors can be reversible and are furnished with separate drive or driven from connecting conveyor. The diameter and spacing of rolls and size of drive chain can be varied to suit operating conditions. Not recommended as a live storage conveyor.

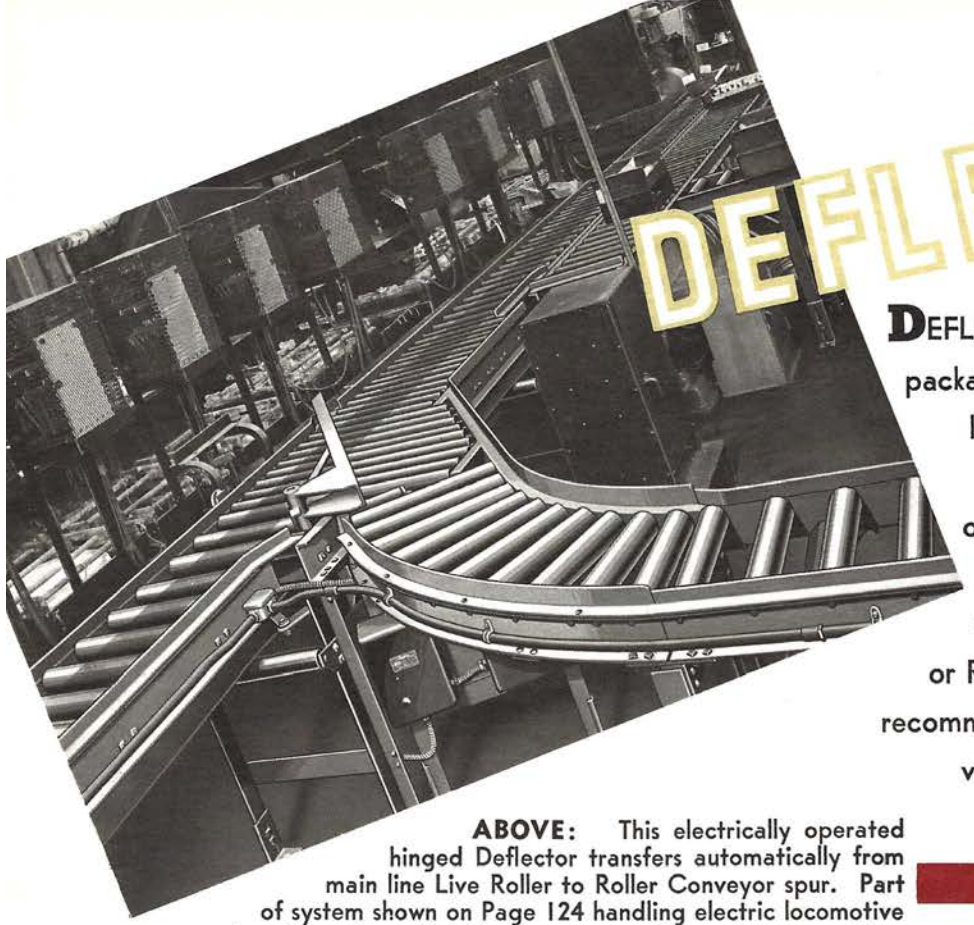
Construction

Typical arrangements of Chain Driven Live Rolls are shown on Pages 129 and 130. The cut steel driving sprockets are usually welded onto carrying rolls, in which case the rolls have stationary shafts and ball bearings in ends of rolls. Where this construction is not practical because of interference between sprockets and articles handled, the shafts are fixed in the rolls and the sprockets keyed to shaft extension, the shafts revolving in pillow blocks equipped with anti-friction bearings.

Chain Drives

The roll to roll Type "X" Chain Drive is recommended under most conditions. This construction gives a more positive drive than the Continuous Chain Type and consequently is adaptable to heavier loads. The Continuous Chain Drive Type "Y" has a single tooth contact and is only suitable for handling relatively light loads. The snub idlers as used with Continuous Chain Drive Type "Y" increase tooth contact with corresponding increase in capacity.

DEFLECTORS



DEFLECTORS are used for discharging packages from conveyor or to connecting lines. They can be fixed, removable or hinged — either manually or power operated. Design of Deflector can be varied to suit conditions. Preferably used with Belt Conveyors, Live Rollers, or Roller Slat Conveyors — not ordinarily recommended with Roller Conveyor or conventional type Slat Conveyors.

ABOVE: This electrically operated hinged Deflector transfers automatically from main line Live Roller to Roller Conveyor spur. Part of system shown on Page 124 handling electric locomotive parts. A number of similar spurs serve the various operations along the main line.

ABOVE: Fixed Deflector discharging bundles of newspapers to trucks for city delivery. Belt Conveyor serves length of platform as shown on Page 100 and has removable deflectors for intermediate discharge.

RIGHT: One of several truck loading spurs in well-known brewery. Deflector is removable and can be reversed to feed spur from either direction of main line reversible Belt Conveyor. Or can allow cases to by-pass to one of the other spurs or to storage.

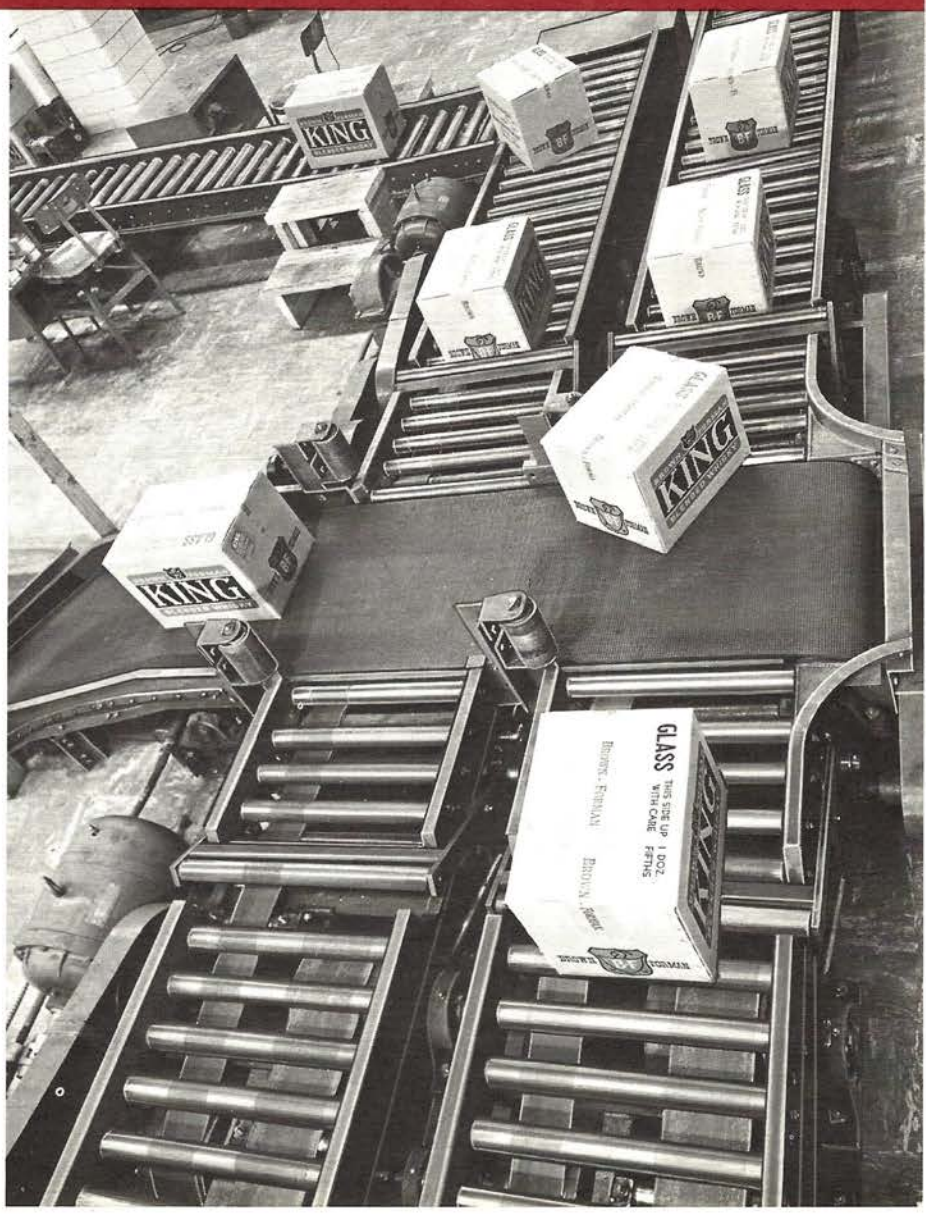
BELOW: Overhead Belt Conveyor in textile mill handling battery filler tubs. Deflectors are electrically operated from floor below. Note sheet steel bed under belt at transfer.

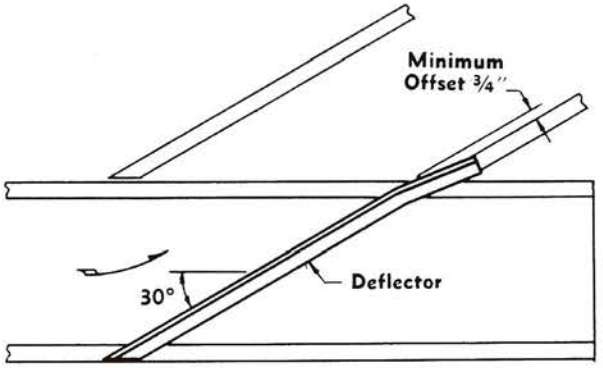
ABOVE: Electrically operated Deflectors on Belt Conveyor handling cartons of empty bottles. This conveyor is fed by Inclined Belt along wall in rear and serves five Roller Conveyor spur lines to fillers. The Deflectors are hinged allowing cases to flow to desired spur.

FOUR-LINE TRAFFIC CONTROL SYSTEM

The view at right shows part of an extensive system of Logan Conveyors in bottling plant of a nationally known distillery. Here four Live Roller Conveyor lines handling filled cases converge onto a Belt Conveyor leading to shipping platform. Flow of traffic to Belt Conveyor is controlled by cam operated roller stops. The cams are power driven and synchronized to allow cases to discharge from each of the four lines in sequence.

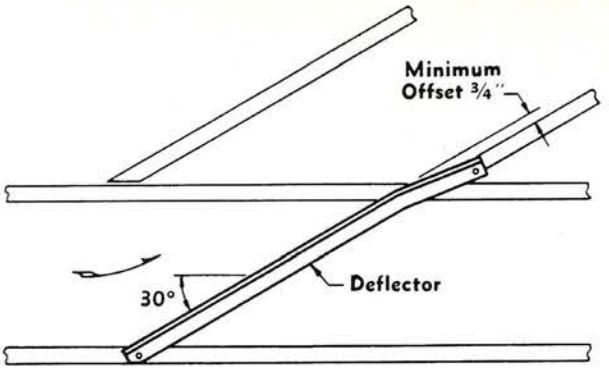
The discharge end of each Live Roller Conveyor is equipped with a short booster section running at a higher speed. These insure a gap between the cases to allow stop to operate and release only one case at a time in the event there is an accumulation of cases in back of stop. All traffic jams are eliminated and operation is fully automatic.





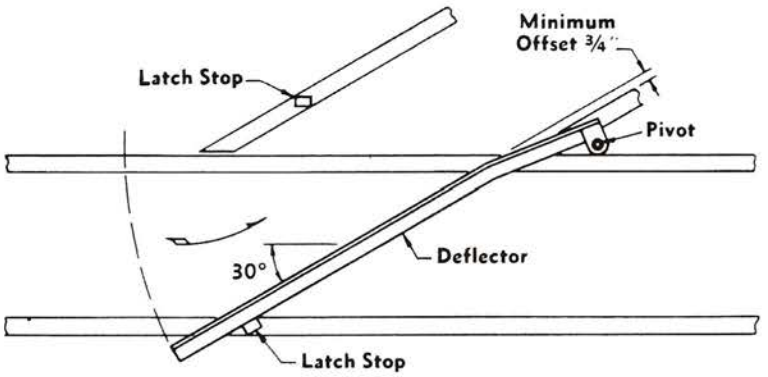
TYPE "A" FIXED DEFLECTOR

Deflector is bolted or welded to conveyor frame. Required for deflecting package where it cannot be discharged over end of conveyor such as at end of return line on double deck conveyors. Also used with Type "D" Belt Conveyor Transfer shown on Page 118.



TYPE "B" REMOVABLE DEFLECTOR

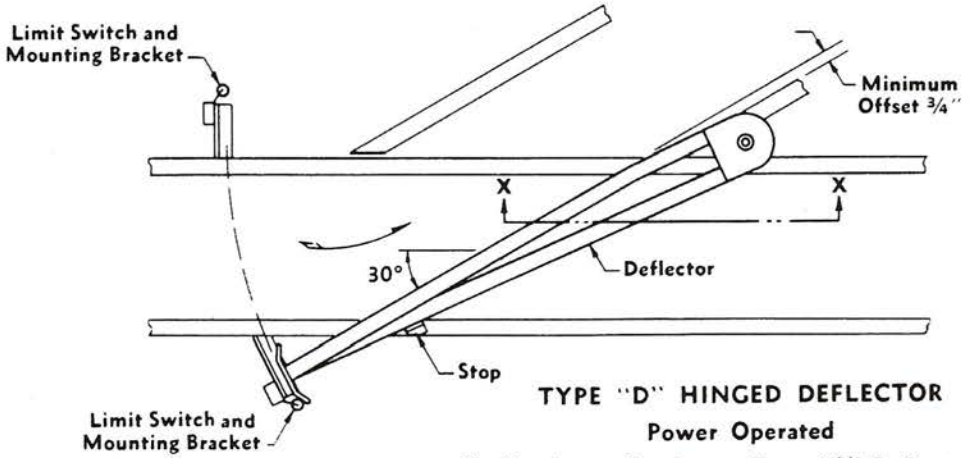
Deflector has pins welded to each end to fit in sockets on conveyor frame. Same Deflector can be used at any number of points along conveyor as required by providing additional sockets. Deflector must be moved manually. Used for deflecting package at intermediate points.



TYPE "C" HINGED DEFLECTOR

Manually Operated

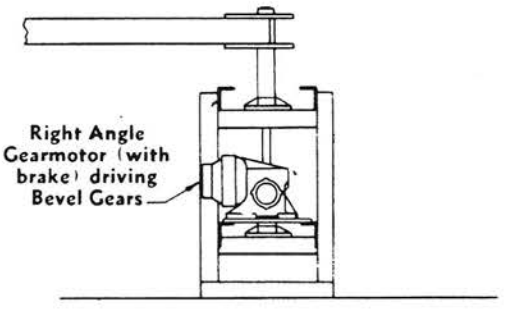
Deflector is pivoted at one end and has latch stops for open and closed positions of movable end. On overhead conveyors the Deflector can be operated by hand lever or cable and sheaves to suit conditions. Used for deflecting package at intermediate point along conveyor.



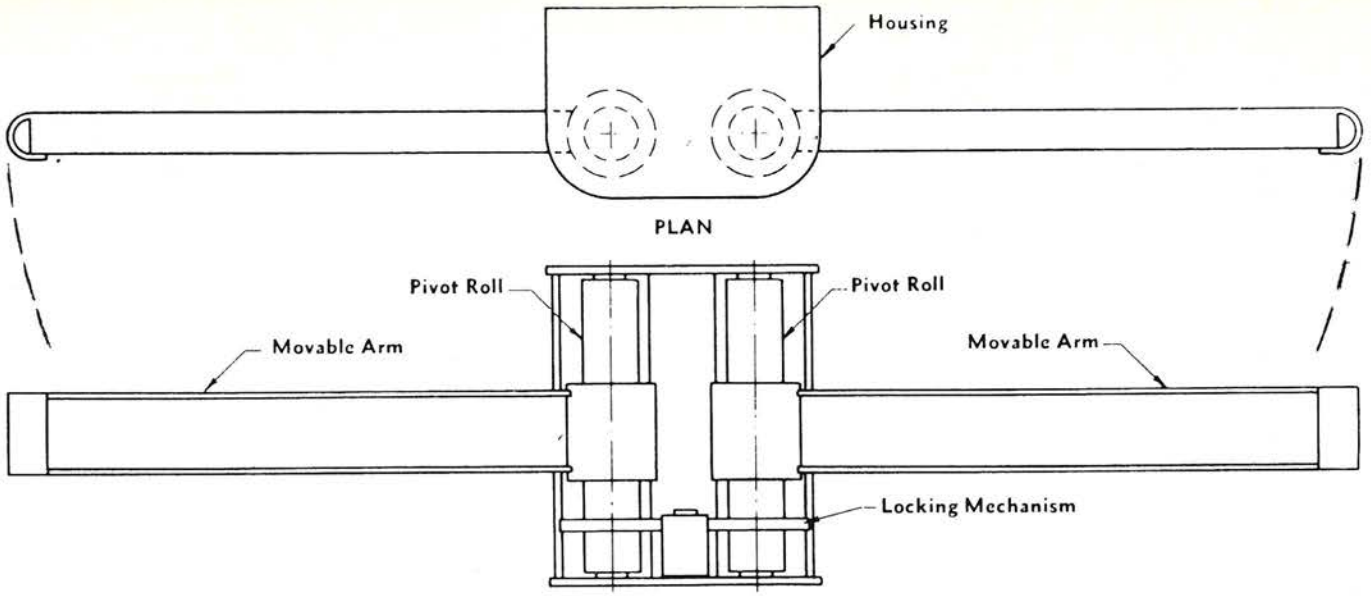
TYPE "D" HINGED DEFLECTOR

Power Operated

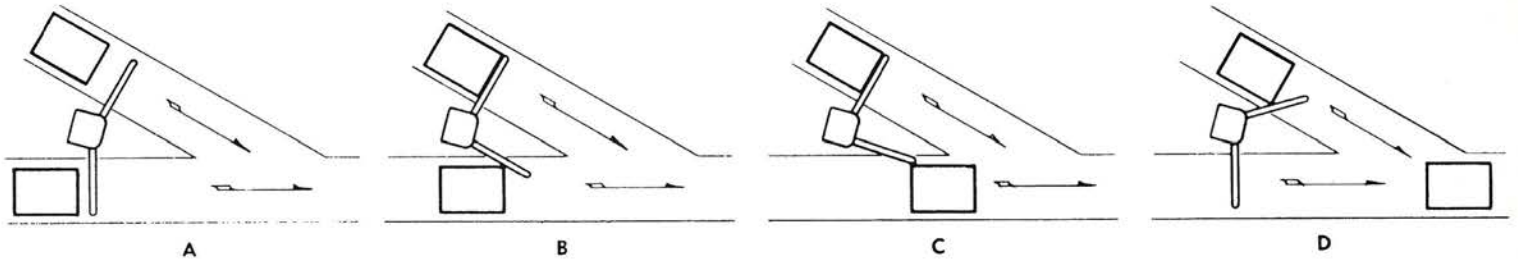
Similar in application to Type "C" Deflector. Operated by a motor which permits remote control, usually at greater distance than practical with Type "C". The swing of movable end is controlled by limit switches for open and closed positions. An air cylinder can be used in place of motor where air is available.



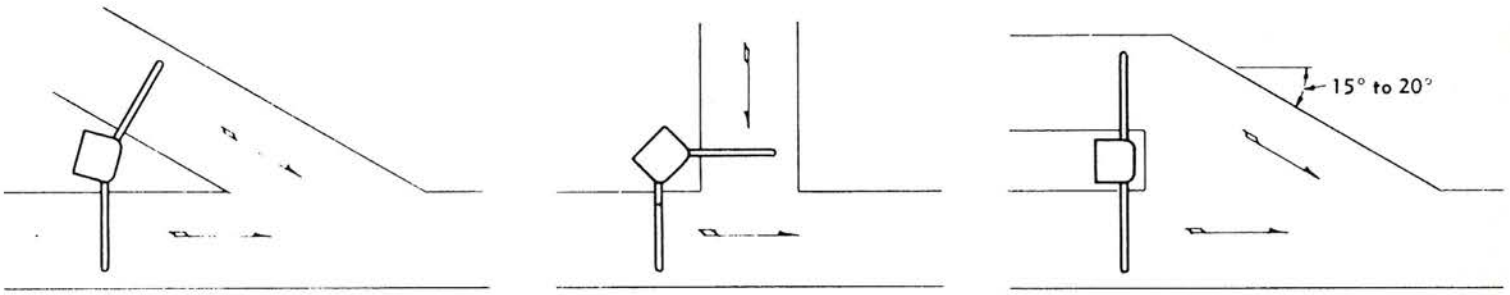
SECTION X-X



DETAIL OF TRAFFIC COP



CYCLE OF OPERATION



TYPICAL APPLICATIONS

GENERAL

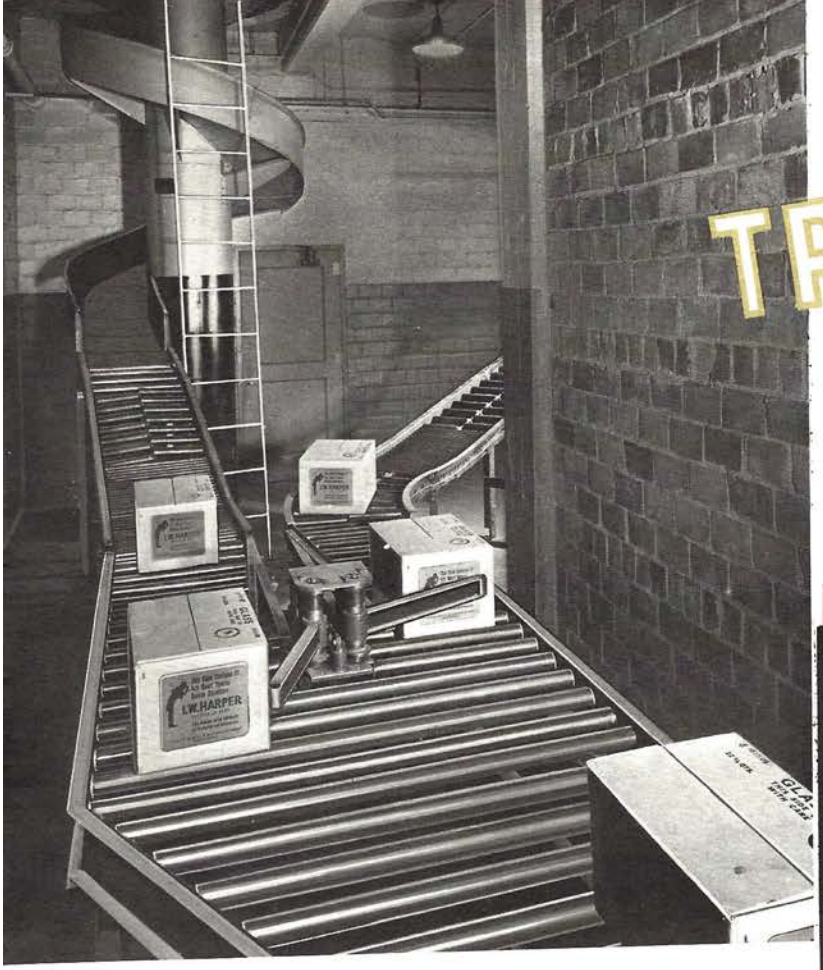
As the name implies, the function of a Traffic Cop is to control the flow of packages at intersections Used where two conveyor lines converge into one or where spur lines feed onto a main line

The Traffic Cop consists of a self-contained unit with two movable arms mounted in normally closed position The mechanism is designed so that when one arm starts to move the other arm is locked automatically until the first arm returns to its normal position. This allows alternate flow of packages from two intersecting lines without interference The arms are available in various sizes and construction to suit the application.

In the Cycle of Operations illustrated above, Fig. A shows two packages approaching intersection The package arriving first opens the arm on its line as in Fig. B and while it is clearing intersection the other package is held back by other arm as in Fig. C. After first package has cleared, the arm returns to normal position and package in other line is then free to move as in Fig. D.

Traffic Cops can be used with many variations of the Typical Applications shown above. Both intersecting lines should be power, preferably Live Roller or Belt Conveyor. In applications of spur lines feeding into main line, the main line is powered and spur line is usually equipped with a short power feeder section. Gravity spur lines can be used under ideal conditions although ordinarily not recommended.

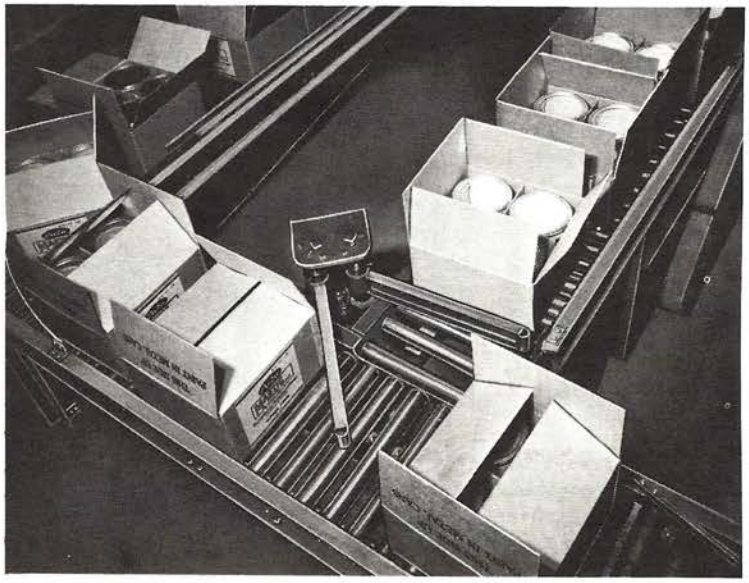
TRAFFIC COP



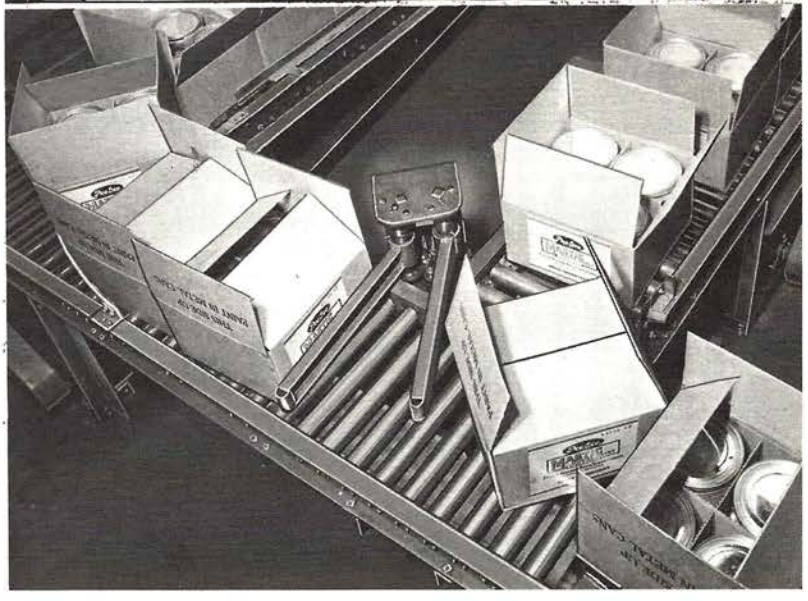
THE LOGAN TRAFFIC COP is mechanically operated and is used to control the flow of packages at intersections to avoid jams.

See detailed description on Page 140.

ABOVE AND RIGHT: Application of Traffic Cop in prominent distillery. Filled cartons from two filler lines on floor above are lowered by Spiral Chutes and converge into single lane to shipment or storage. The Traffic Cop permits alternate flow as shown and eliminates interference. Converging conveyor is a Belt Driven Live Roller.

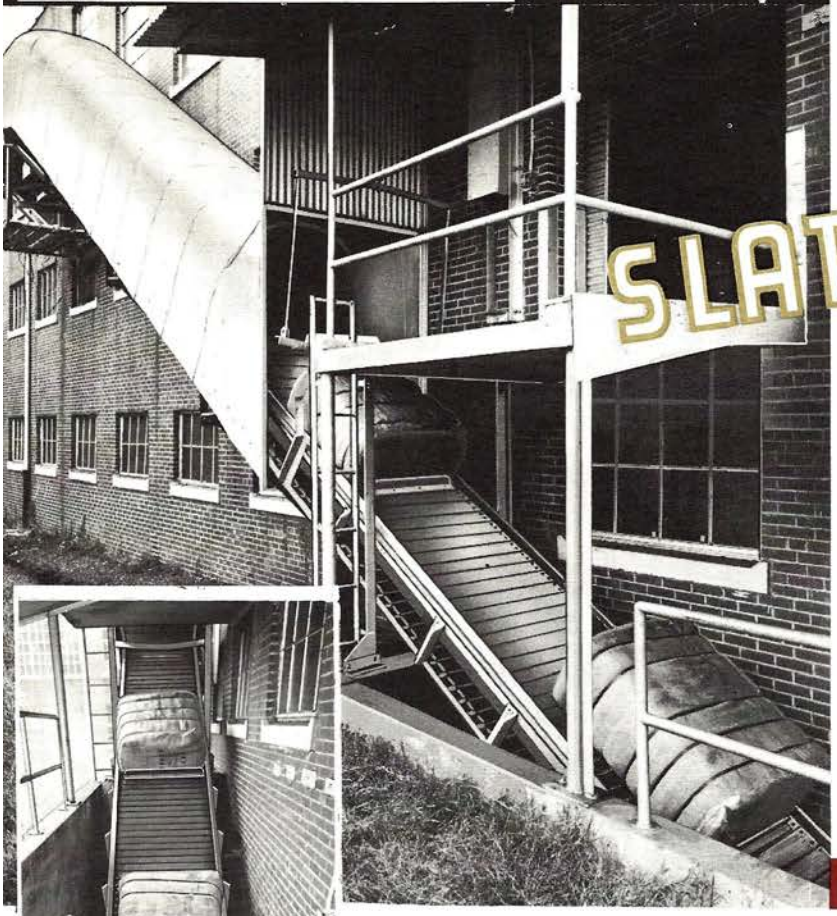


ABOVE: System of Live Roller Conveyors handling cartons of paint to sealer. The Traffic Cop holds back cartons on spur line while permitting flow from line at left. When clear the arm on spur line is released.



ABOVE: View of same system shown at left. Here the flow is from spur line with Traffic Cop holding back cartons in main line. When spur line is clear the arm on main line is released. Operation is fully automatic.

SLAT CONVEYORS

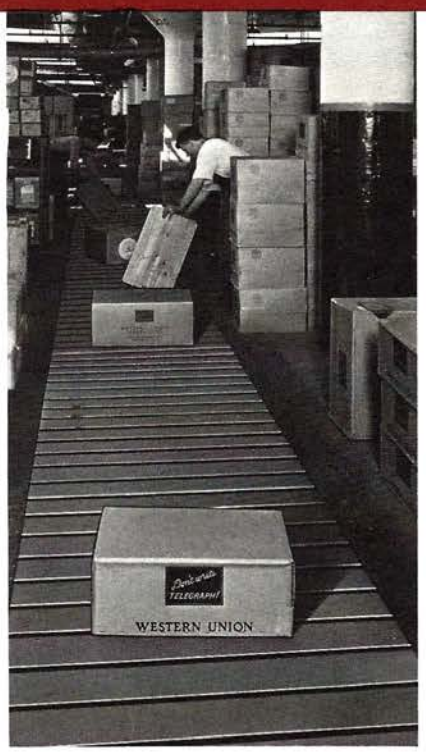


FOR most situations where the packages are heavy, or where there is appreciable shock in loading, Slat Conveyors are preferable to Belts. They will handle practically all packages that a flat belt will handle. And, in general, their use is indicated where a strong, rigid carrying surface is desirable.

Slat Conveyors consist essentially of two endless strands of roller chain connected by slats of either steel or wood which form an endless carrying surface.

ABOVE: Logan Slat Conveyor handling bales of cloth from basement and first floor storage to finishing department on second floor. View at left shows basement feed end. Platform above serves first floor via hinged slide at entrance to housing. A roller conveyor curve facilitates discharge into building at second floor.

BELOW: Horizontal and inclined Slat Conveyor in a wholesale drug warehouse handling cartons and filled tote boxes from basement to shipping platform on floor above. Lower in first cost and upkeep than a freight elevator. Conveyor is reversible.

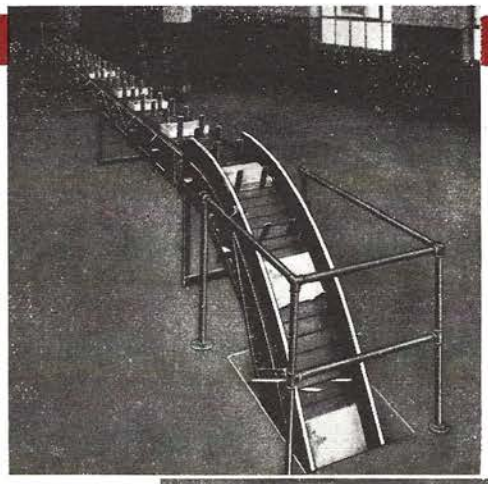


ABOVE: Slat Conveyor used for taking stock from warehouse to shipping room. Handles cases and cartons of all sizes which are loaded directly onto conveyor at any point along the line. The conveyor is installed flush with floor and can be walked on or trucked over, while in motion, without interruption to traffic.

BELOW: A battery of wide Slat Conveyors which bring rolls of linoleum into packing room, delivering direct to crating line or Roller Conveyor. Close-spaced cleats prevent packages from rolling on inclined portion at loading end.

ABOVE: Reversible inclined Slat Conveyor handling spare parts of tractors to and from stock room. Note finger construction of cleats which permit use of discharge fingers to close gap between connecting Roller Conveyor. Used here to allow handling of small packages.

BELOW: Tote boxes of lawn mower castings are raised from first floor machining operations to assembly on the second floor by this Slat Conveyor. Cleats or raised flights spaced at suitable intervals prevent material from sliding on steep inclines.

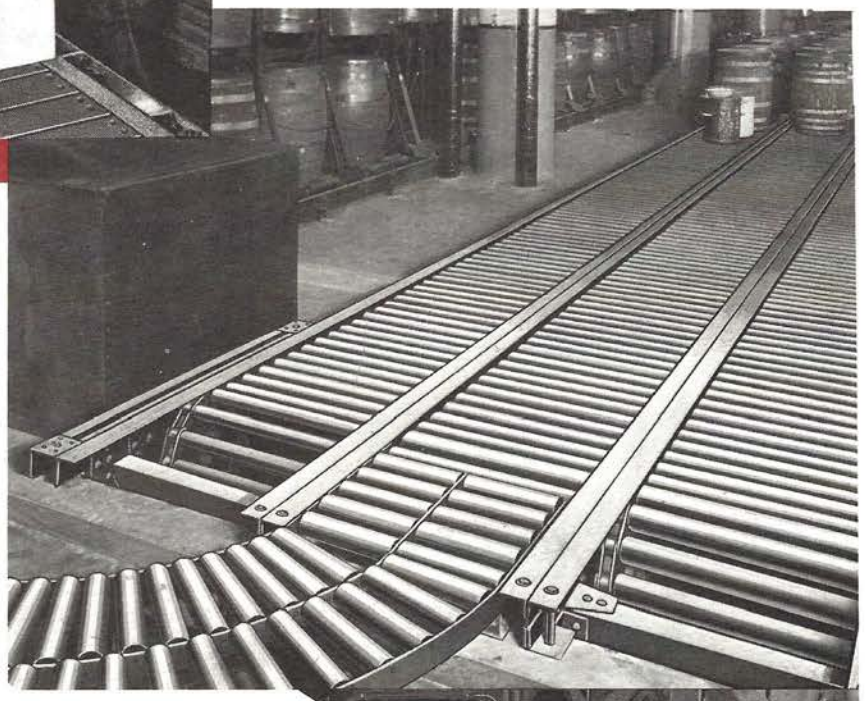


RIGHT: Magazines from first floor bindery are elevated to second floor packing and shipping room. The portion through floor and around curve is equipped with high guard rails on both sides. Loading and unloading of conveyor is performed manually in this case. The special cleats hold the loose magazines in neat stacks and facilitate removal along second floor horizontal run.

BELOW: Electric range assembling is simplified with this Logan Slat Conveyor. Operators remain at their respective stations and product moves to them at convenient working height. Sub-assemblies are also brought in by auxiliary conveyors. Manual handling is reduced to a minimum.

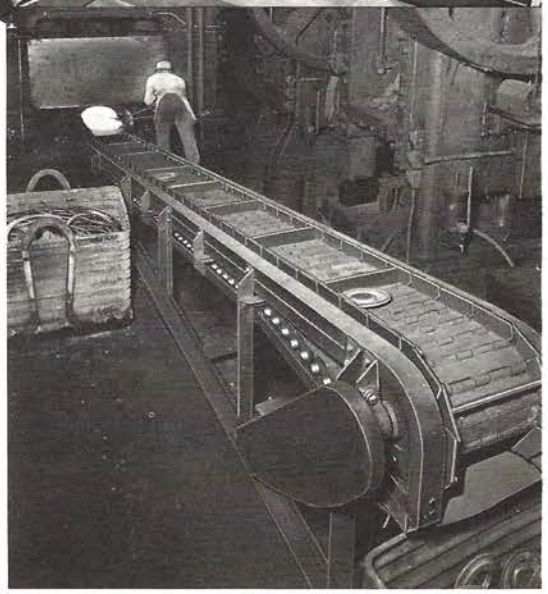
ABOVE: Inclined Slat Conveyor handling miscellaneous wholesale hardware. The finger type cleats permit closer delivery to Roller Conveyor at discharge end. Suitable cut-outs in take-off rolls decrease gap required with full cleats.

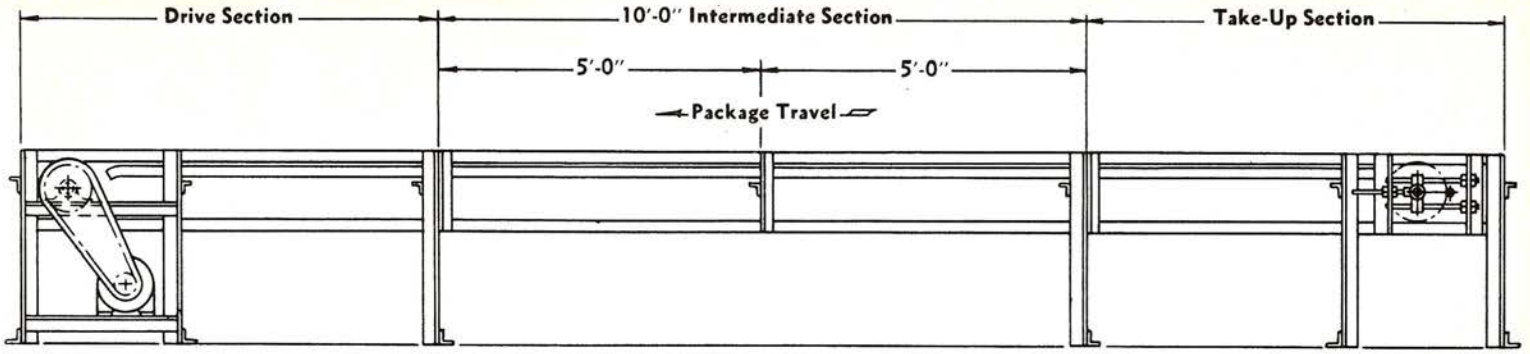
RIGHT: A triple line Logan Roller Slat Conveyor handling barrels of percolated drugs. This constructions permits stopping the package while the conveyor continues to run.



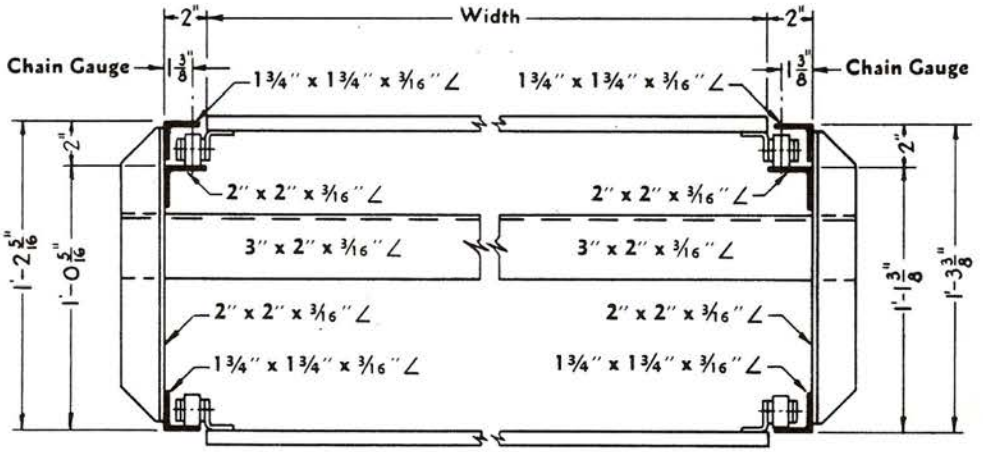
BELOW: Roller Slat Conveyor in newspaper publishing plant. View shows bundles of rotogravure sections enroute to tying machine in foreground. Conveyor is reversible for discharge to similar tying machine at opposite end.

RIGHT: Press formed tractor forgings are handled on Logan Hinged Pan Apron Conveyor. This construction eliminates possibility of parts jamming between the aprons as sometimes occurs with the ordinary Slat or Overlapping types. Also particularly desirable in handling small parts and scrap materials.





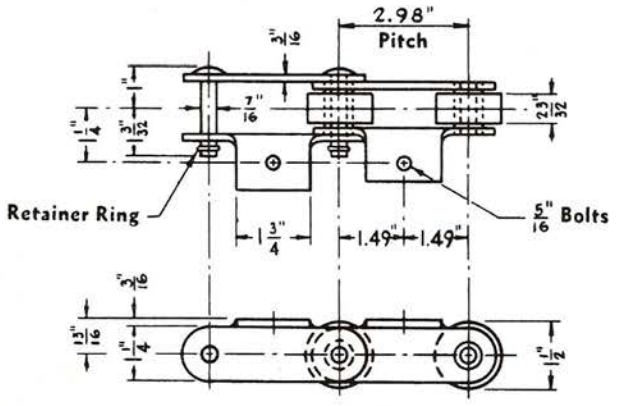
GENERAL ASSEMBLY OF SLAT CONVEYOR



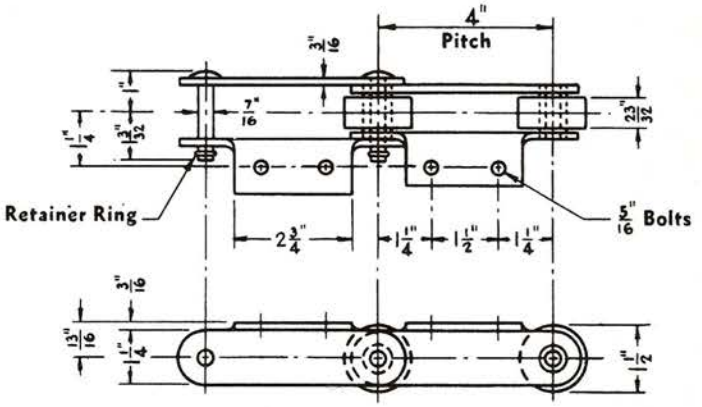
DETAIL FOR #9½ CHAIN
With 11-T Sprocket 10⅝" P.D.

DETAIL FOR #954 CHAIN
With 9-T Sprocket 11 1/16" P.D.

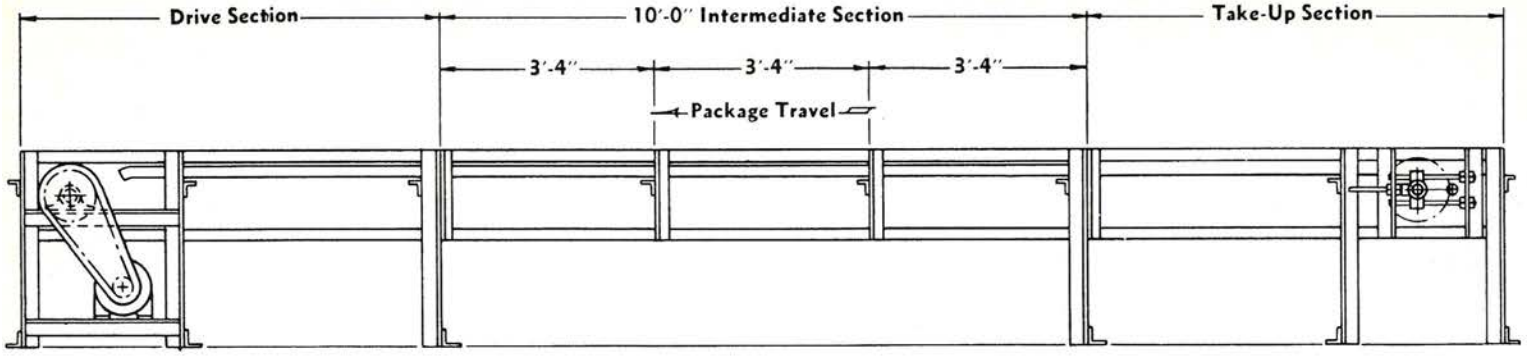
CROSS SECTION
Showing Type "AA" Wood Slat



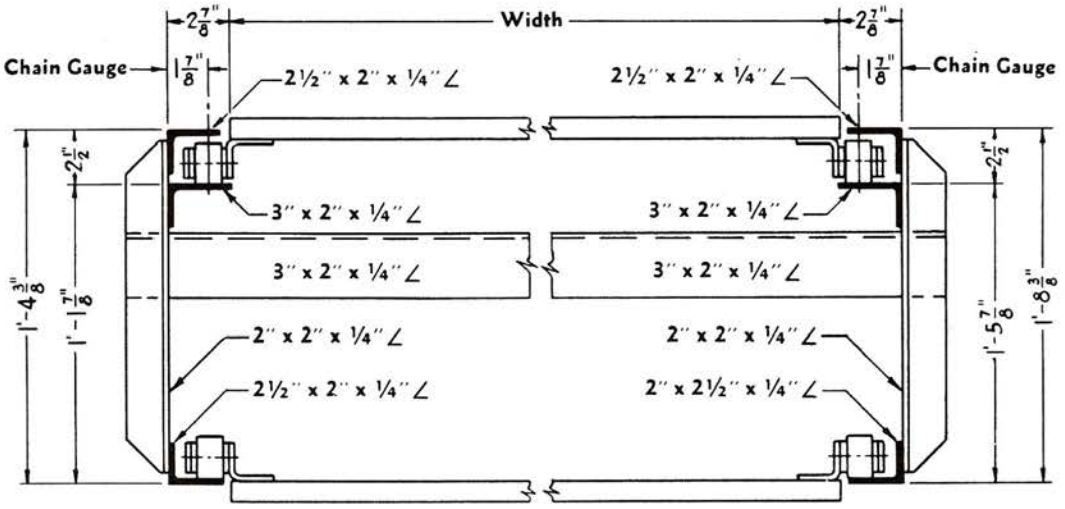
#9½ CHAIN
½ K-1 Attachment



#954 CHAIN
½ K-2 Attachment



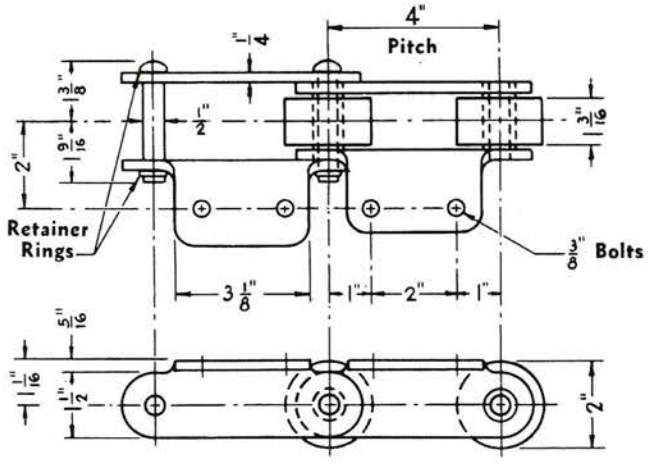
GENERAL ASSEMBLY OF SLAT CONVEYOR



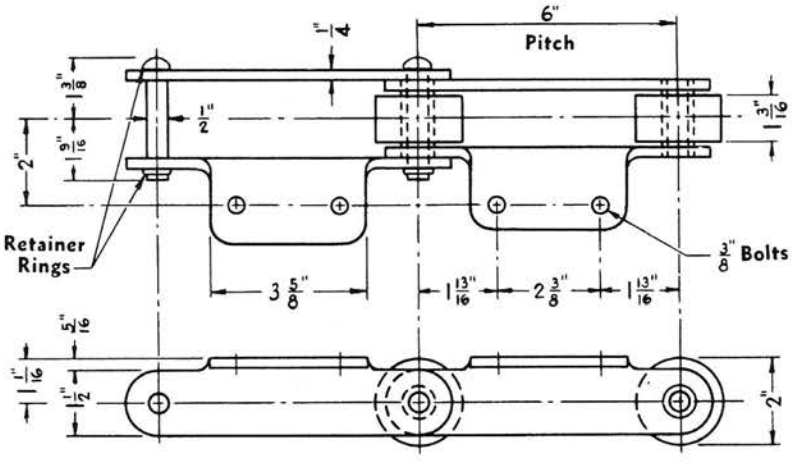
DETAIL FOR #2194 CHAIN
With 9-T Sprocket 11 1/16" P.D.

DETAIL FOR #2196 CHAIN
With 8-T Sprocket 15 1/16" P.D.

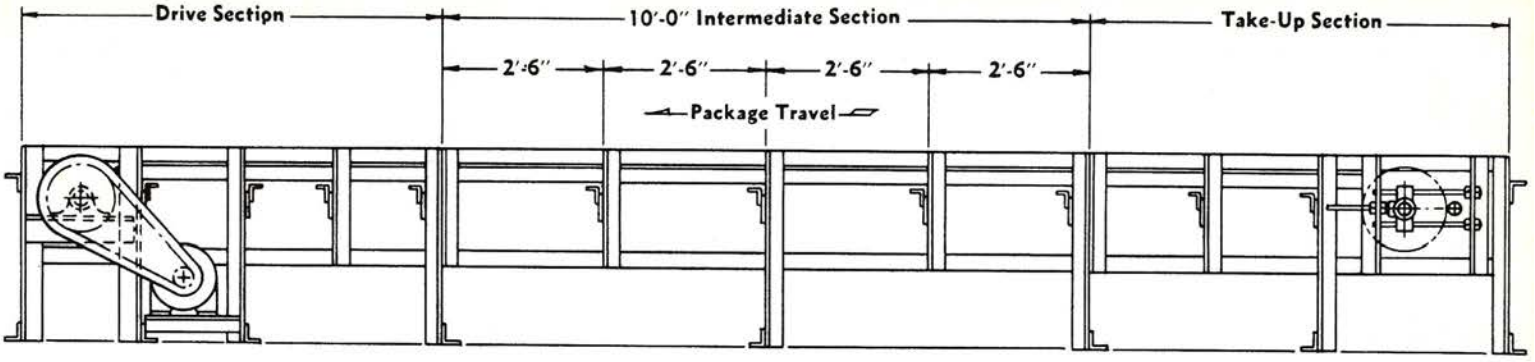
CROSS SECTION
Showing Type "AA" Wood Slat



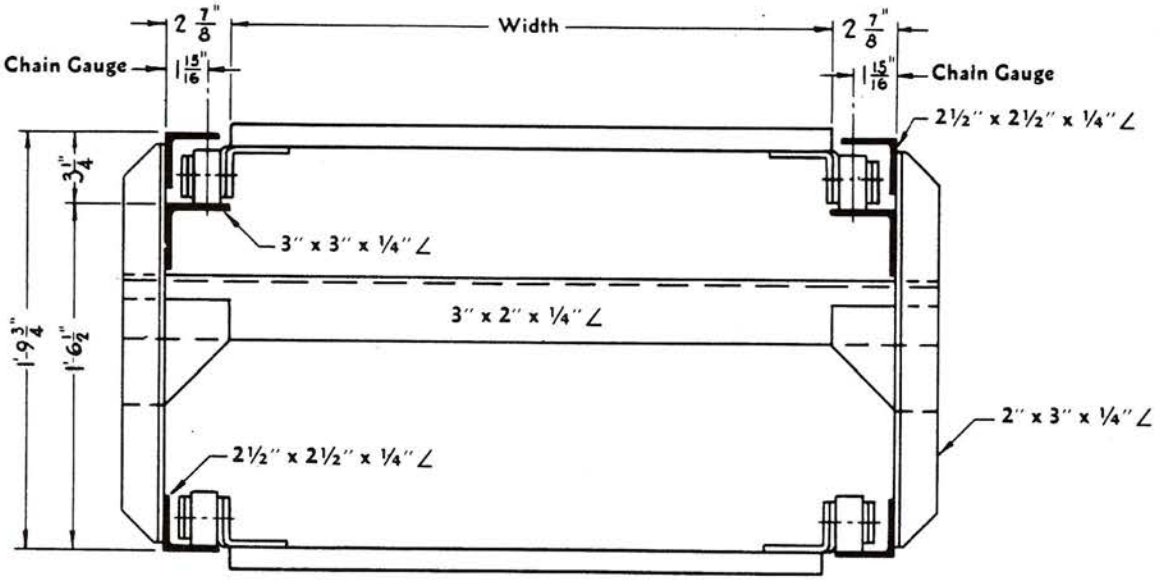
=2194 CHAIN
A-2 Attachment



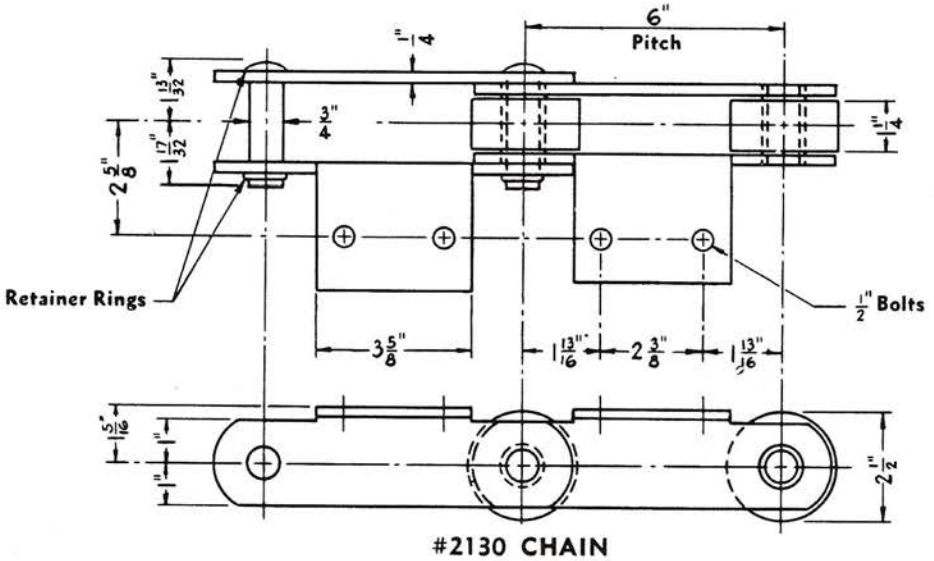
=2196 CHAIN
A-2 Attachment



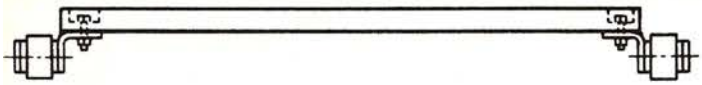
GENERAL ASSEMBLY OF SLAT CONVEYOR



CROSS SECTION—Showing Type "AA" Wood Slat
DETAIL FOR #2130 CHAIN—with 8-T Sprocket 15 1/16" P.D.

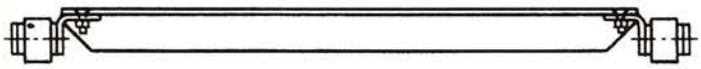


#2130 CHAIN
A-19 Attachment



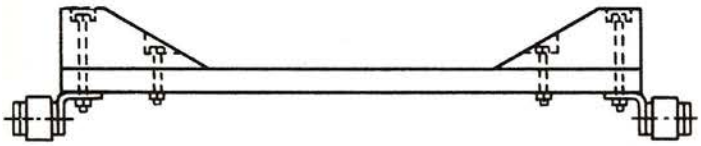
TYPE "AA" WOOD SLAT

TYPE "AB" STEEL SLAT



TYPE "AC" ANGLE SLAT

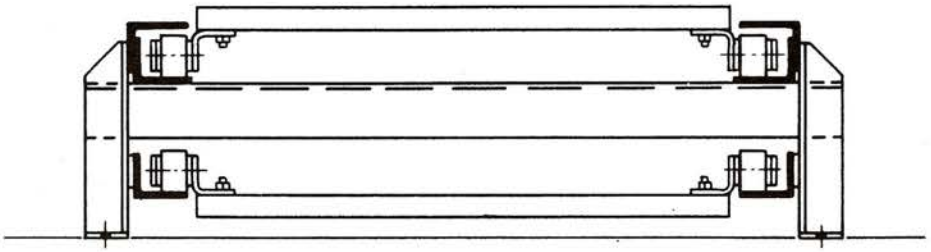
TYPE "AD" CHANNEL SLAT



TYPE "AE" WOOD TROUGH

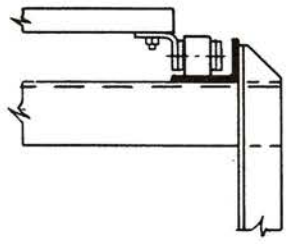
TYPE "AF" STEEL TROUGH

DETAIL OF SLATS

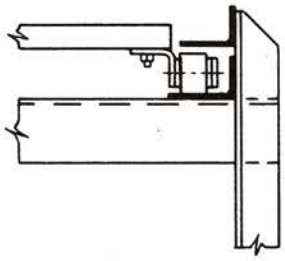


CROSS SECTION OF LOW TYPE SLAT CONVEYOR

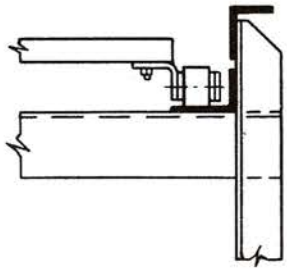
Used where necessary to hold elevation to a minimum.
Requires suitable pits at ends for drive and take-up sections.



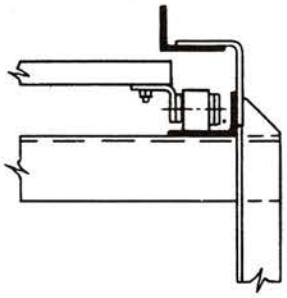
STYLE "A"
COVER ANGLE OMITTED



STYLE "B"
COVER ANGLE INVERTED

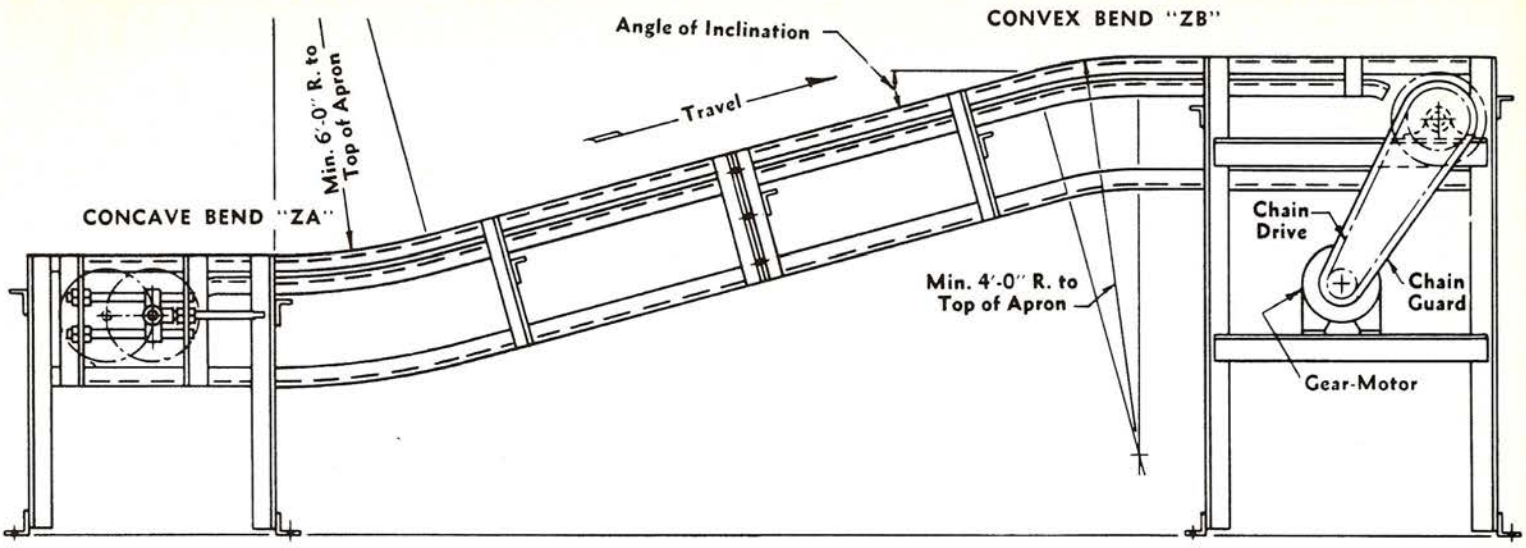


STYLE "C"
GUARD ANGLE TURNED OUT



STYLE "D"
GUARD ANGLE EXTENDED OVER APRON

ALTERNATE FRAMES AND GUARD RAILS



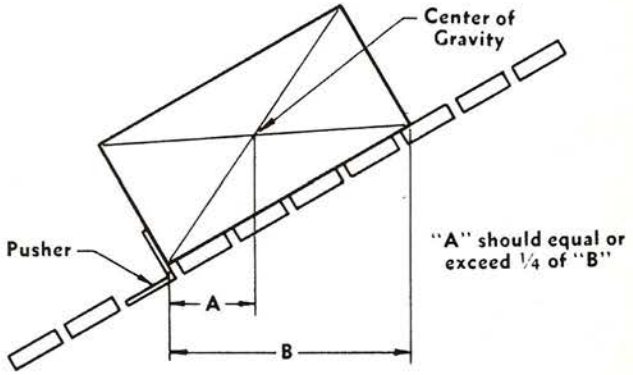
GENERAL ASSEMBLY OF INCLINED SLAT CONVEYOR

MAXIMUM INCLINES WITHOUT PUSHERS

Wood Boxes on Wood Slats	12° Max.
Metal Commodities on Wood Slats	9° Max.
Commodities with Metal Runners on Metal Slats	6° Max.

The above slopes apply to dry conditions only; the presence of oil or other substances may affect the angle of inclination considerably.

Slat Conveyors with inclines greater than above should have pusher slats. (See diagram at right.)



MAXIMUM INCLINE WITH PUSHERS

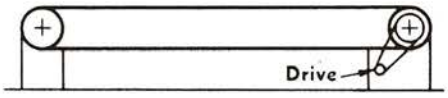


DIAGRAM "A"

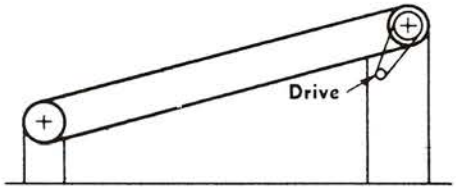


DIAGRAM "B"

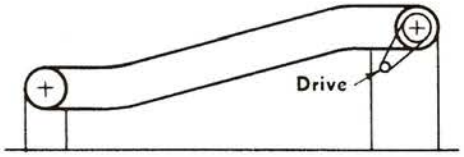


DIAGRAM "C"

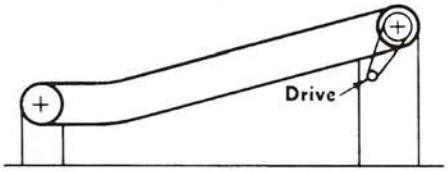


DIAGRAM "D"

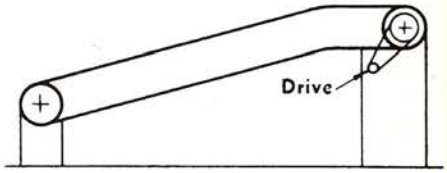


DIAGRAM "E"

SLAT CONVEYOR APPLICATIONS

The diagrams also apply to steeper inclines with cleats

General

Slat Conveyors consist essentially of two endless strands of roller chain connected by slats which form an endless carrying surface. They can be horizontal or inclined or a combination of both and can be reversible.

Types shown on preceding pages answer most requirements. Other types can be furnished to meet special conditions. Wood or steel slats are most frequently used, but where load is extremely heavy or conveyor very wide, angle or channel slats are sometimes necessary. For cylindrical packages handled lengthwise on conveyor, wood or steel trough slats are recommended.

Slat Conveyors can be installed flush with floor by setting conveyor in a pit. Steel floor plates over the chain permit trucking across conveyor while in motion.

Roller Slat Conveyors

Roller Slat Conveyors are equipped with rollers between chains in place of slats. Rollers can be any of the regular Roller Conveyor types to suit conditions. This type is used where it is desired to stop or store packages on conveyor line without stopping the conveyor.

At deflecting points suitable strips are furnished in contact with underside of rollers to insure positive rotation. The rotation of the rolls plus the speed of the chains doubles the speed of package which further facilitates transfer. Application of similar strips also permits handling on slight inclines.

Inclined Slat Conveyors

Slat Conveyors can be built horizontal, inclined, or in combination as shown on Page 151. The maximum allowable incline depends on the size, weight and type of packages handled and also on operating conditions. Also see Page 151 for maximum inclines with and without pushers. The size and type of pushers depend on the articles handled and the angle of incline. Pushers can be used on Slat Conveyors in many cases where they would not be practical on Belt Conveyors, because here they do not cause complications at bends. For handling sacks, the critical angle may be greatly increased without resorting to pushers, by using steel channel slats with flanges turned up. Conveyors with cleats are not adapted to receive packages automatically from other conveyors.

Frames

Slat Conveyor frames consist of chain track angles with rigid angle bracing and suitable supports. The cross sections shown on Pages 145 to 147 are recommended for ordinary conditions. A continuous cover angle over carrying strands of chain is standard construction. This is recommended for safety and as a protection to the chain but can be omitted if desired. (See Style "A", Page 148)

Special frames can be furnished to meet special conditions. The cross section on Page 148 shows the construction used where necessary to hold elevation to a minimum.

Guard Rails

Guard Rails for packages may usually be omitted from Slat Conveyors operating at normal working height, but as a safety measure are always furnished on overhead conveyors. Styles "B", "C" and "D" on Pages 148 are typical

Chains

The Logan all-steel roller chains listed below are regularly used on Slat and Apron Conveyors. All have case hardened bushings. Other types and sizes of chains can be furnished if conditions require.

Chain No.	Pitch	Diam. of Rollers	Face of Rollers	Ultimate Strength
9½	2.98"	1½"	23/32"	10,000 lbs.
954	4.00"	1½"	23/32"	10,000 lbs.
2194	4.00"	2"	1 3/16"	20,000 lbs.
2196	6.00"	2"	1 3/16"	20,000 lbs.
2130	6.00"	2½"	1¼"	32,500 lbs.

The chains can be mounted under, instead of to one side of the slats if conditions require. For very heavy loads or extra large packages requiring a wide carrying surface, a third strand of chain is sometimes placed under the center of the slats. Chains with flanged rollers traveling on rails can be furnished where required.

Ends

Drives shown on Pages 102 and 103 are applicable to Slat Conveyors. Take-ups are always either Type "TB" for light or medium duty or Type "TD" for heavy duty. (See Page 104)

Right Angle Turns

When transferring at right angles from the end of one Slat Conveyor onto another, separate drives are required for each conveyor.

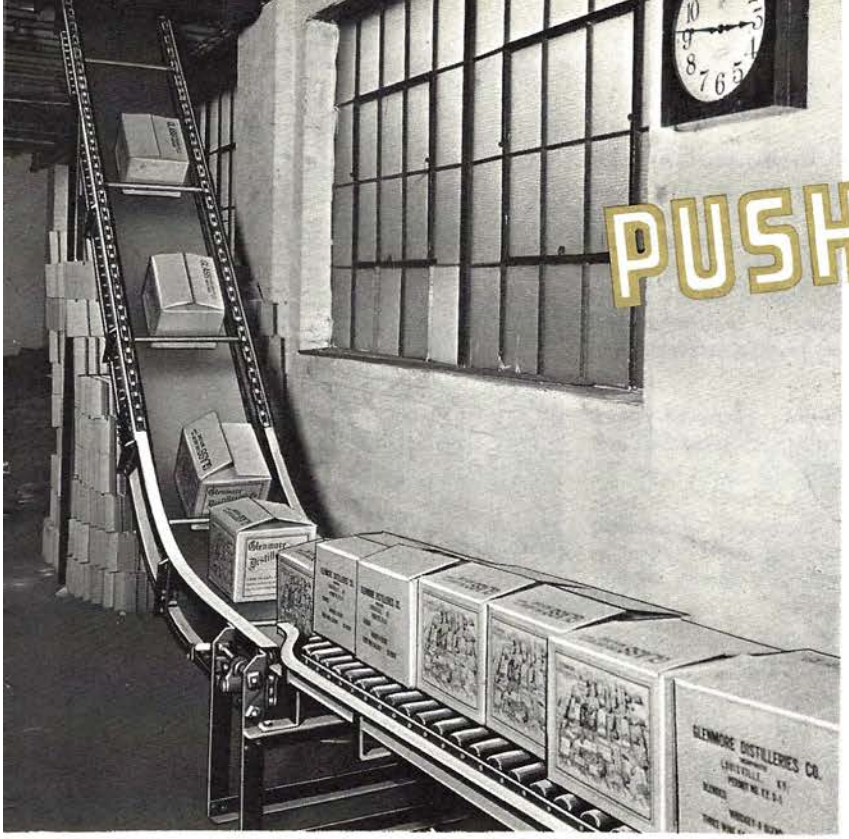
Deflectors

Deflectors are rarely used on Slat Conveyors. They are practical only where the packages handled are such that there is no possibility of their catching on the edges of slats, or where specially designed slats are used.

Portable Slat Conveyors

Slat Conveyors can be made portable by mounting them on wheels or swivel casters. Each unit is equipped with a self-contained drive. Where desirable to hold conveyor stationary while in operation, adjustable floor locks can be furnished.

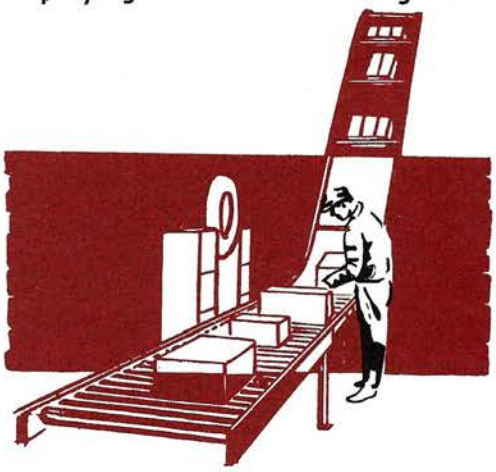
PUSHER-BAR TYPE

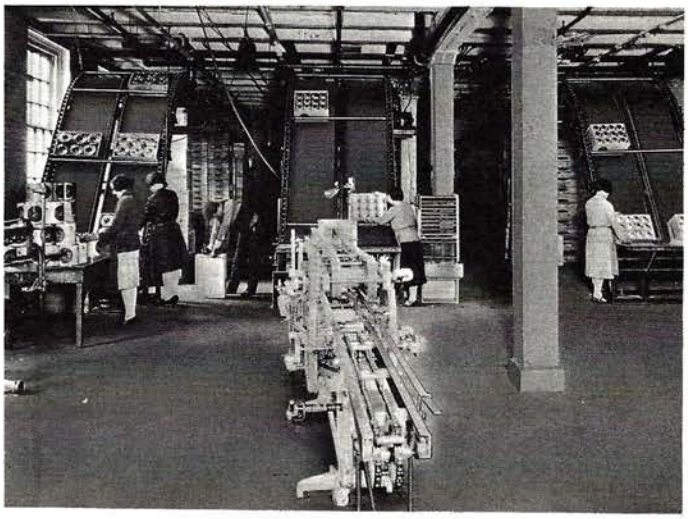


ABOVE: Pusher-Bar Conveyor handling cartons of empty bottles from first storage room to bottling and packing department on second floor. Automatic loading is assisted by a pulley on bottom tail shaft which pulls package onto the slide bed. Cartons do not start incline until picked up by pusher.

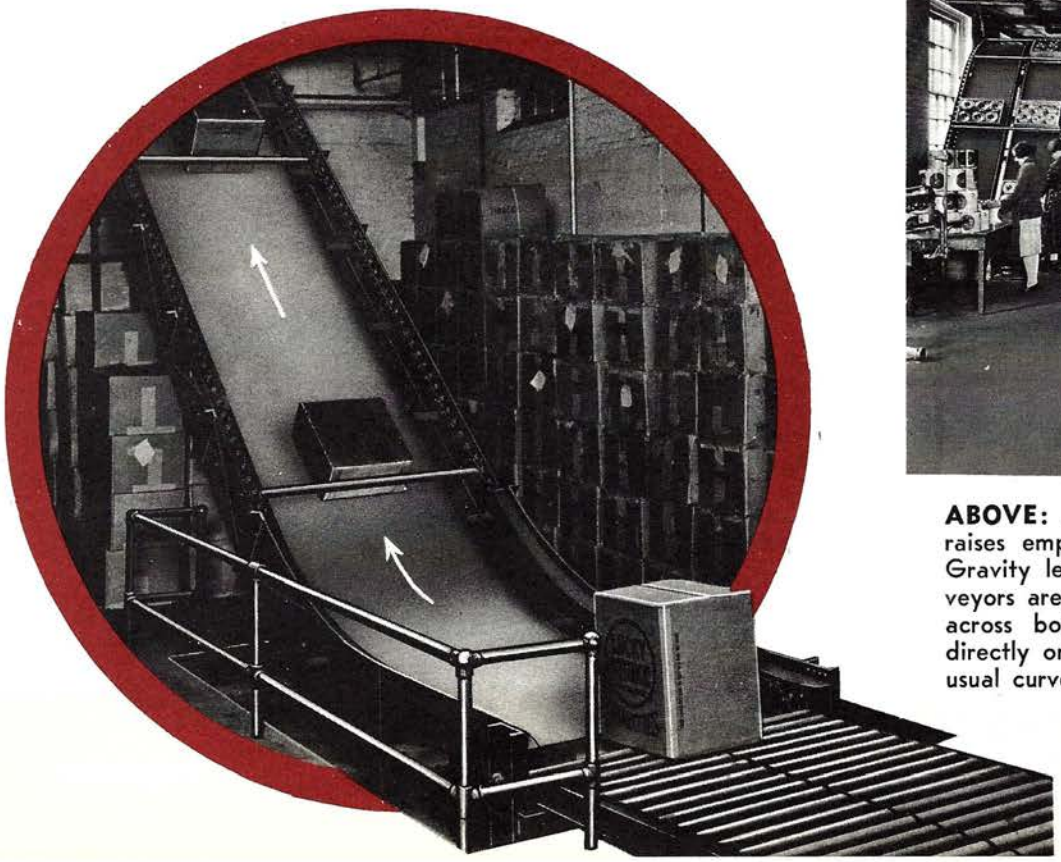
IN CIRCLE: This 45° Pusher-Bar Conveyor is reversible. It handles incoming shipments of tinplate, and also outgoing containers. Outgoing packages are received automatically from the Roller Conveyor at the bottom. Incoming packages must be placed by hand against a pusher at the upper end.

FOR elevating at angles greater than 30° and up to 60° the Pusher-Bar type of conveyor is usually the best solution. Packages slide on stationary bed and are impelled by pushers mounted between two endless strands of roller chain. The bed is ordinarily of sheet steel and the pushers usually ball bearing rollers. Pusher-Bars can be used for angles steeper than 60°, or even vertically, by employing suitable overhead guides.





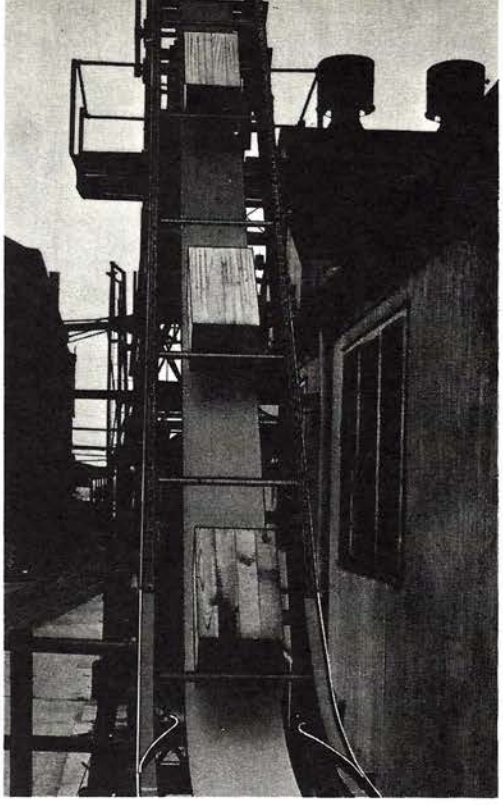
ABOVE: A battery of Pusher-Bar Conveyors raises empty paint cans to overhead lines of Gravity leading to filling machines. The conveyors are double width with pushers extending across both slide beds. Crates are placed directly onto inclined slide bed eliminating the usual curved and straight portion at bottom.

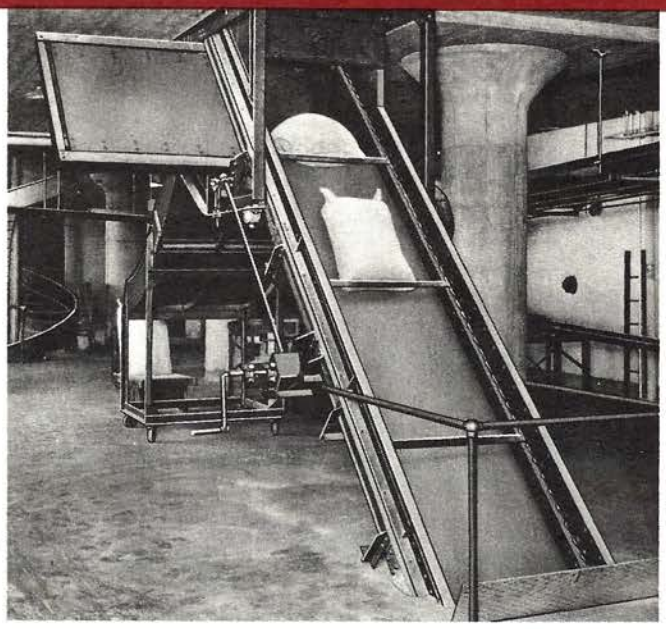


LEFT: This Pusher-Bar handles sacks of feed from box cars at first floor to third floor processing. Horizontal portion at second floor, shown here, permits intermediate loading or take-off. Channel pushers are generally recommended when handling sacked materials.

RIGHT: Shipping cases of glassware and druggists' sundries are raised by Pusher-Bar Conveyor to head end of long Gravity line leading to warehouse. Retaining springs at bottom hold cases in check until they are firmly seated in front of pusher.

A narrow slide bed is used here although wider cases may be handled provided they will clear in between the chain tracks. Special slide beds can be furnished as required to suit conditions.



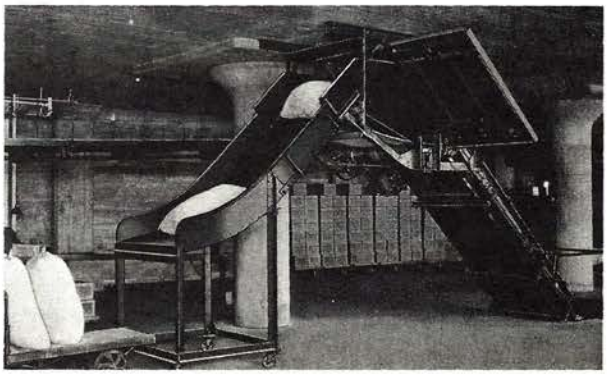


"GATE-BED TYPE"

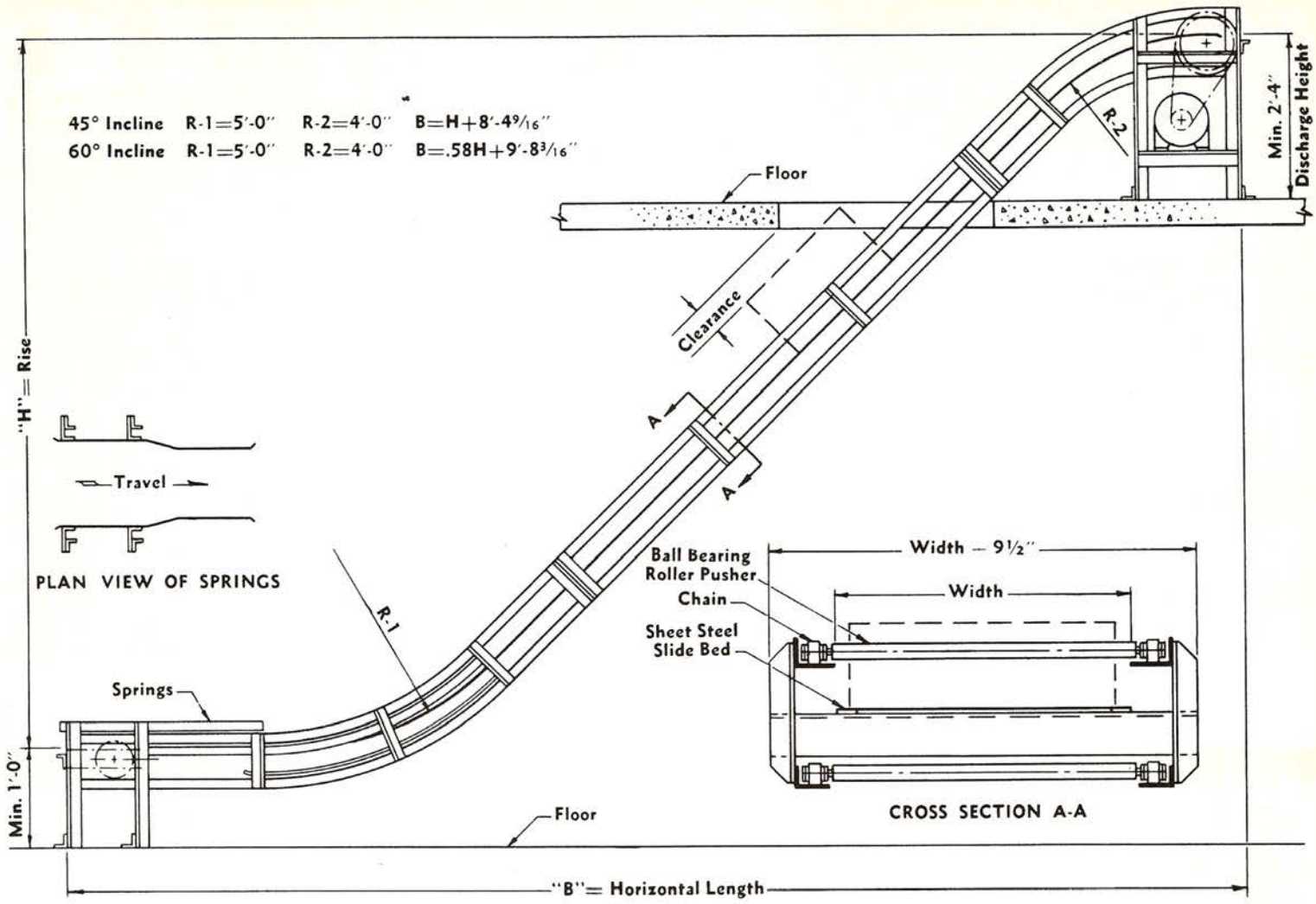
PATENTED

The Logan "Gate-Bed" Pusher-Bar is a machine designed to discharge packages automatically at intermediate points as well as over the top. This is accomplished by inserting sliding gates in the conveyor bed at such points. The gates are opened and closed by a rack and pinion arrangement operated with a hand crank.

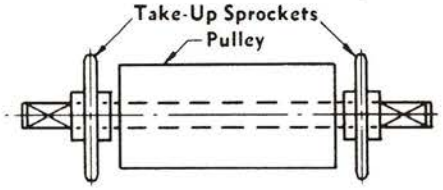
Perfect discharge conditions at the intermediate points are obtained by using short sections of Belt or other suitable type of power conveyor to draw the packages quickly away from the lift. The Belt sections are powered by means of sprockets which engage chains carrying the pushers. A single motor driving the entire unit.



ABOVE AND RIGHT: "Gate-Bed" Type which handles sacks of flour from basement to fourth floor, with provision for discharging at the three intermediate floors. Here the return run of chains and pushers is dropped down along wall at rear and across ceiling in basement. The discharge slide is portable and can be pushed out of way when not in use. When gate is closed the sacks continue their upward journey over closed gate to discharge end of conveyor on top floor unless gates are opened at other floors en route.

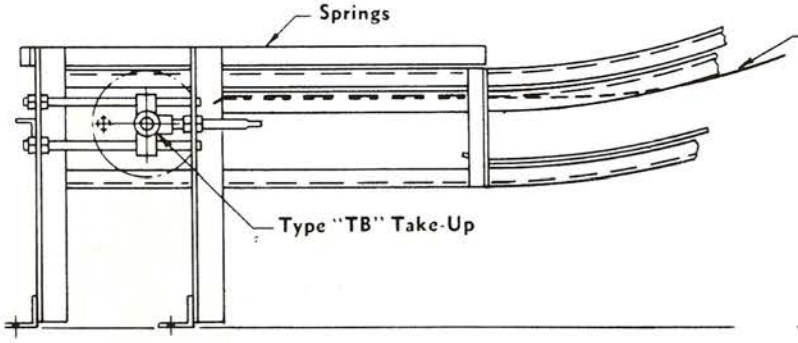


GENERAL ASSEMBLY OF PUSHER BAR CONVEYOR

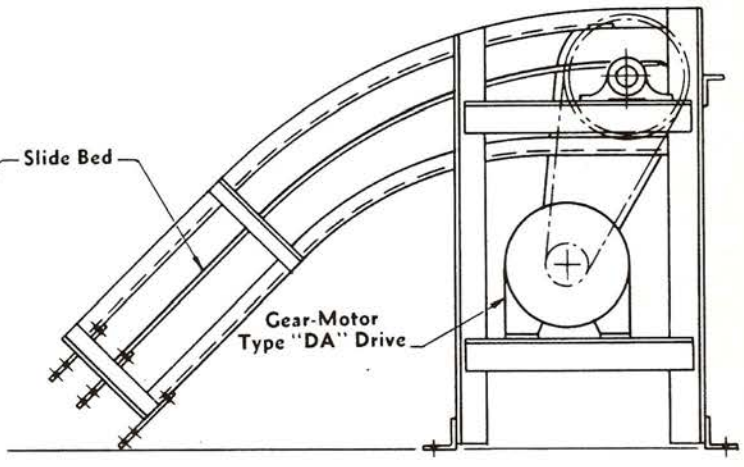


LOADING PULLEY

Recommended for Small Packages



DETAIL OF TAIL END



DETAIL OF DRIVE END

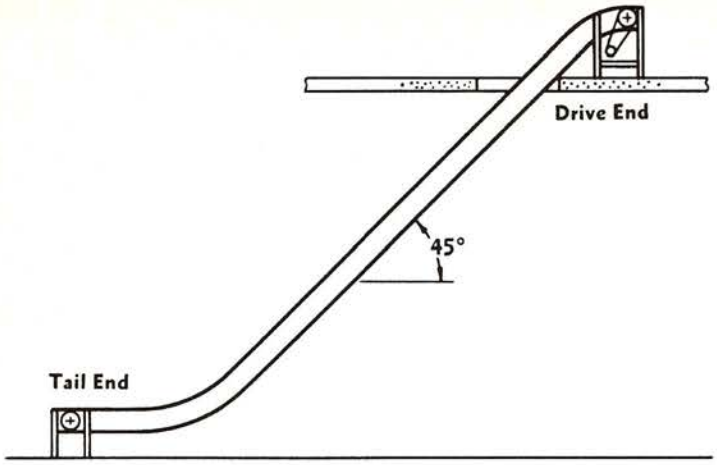


DIAGRAM "A"

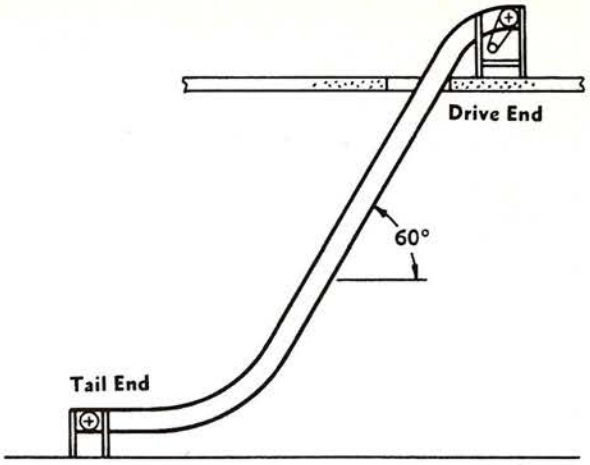


DIAGRAM "B"

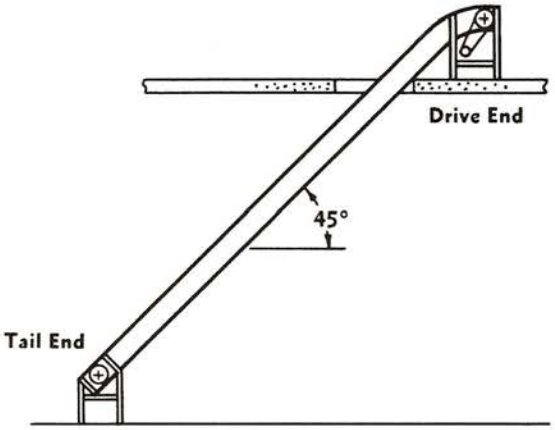


DIAGRAM "C"

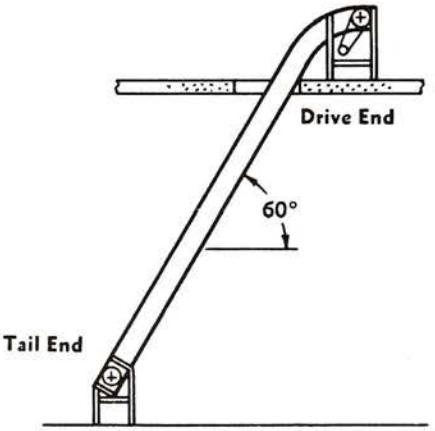


DIAGRAM "D"

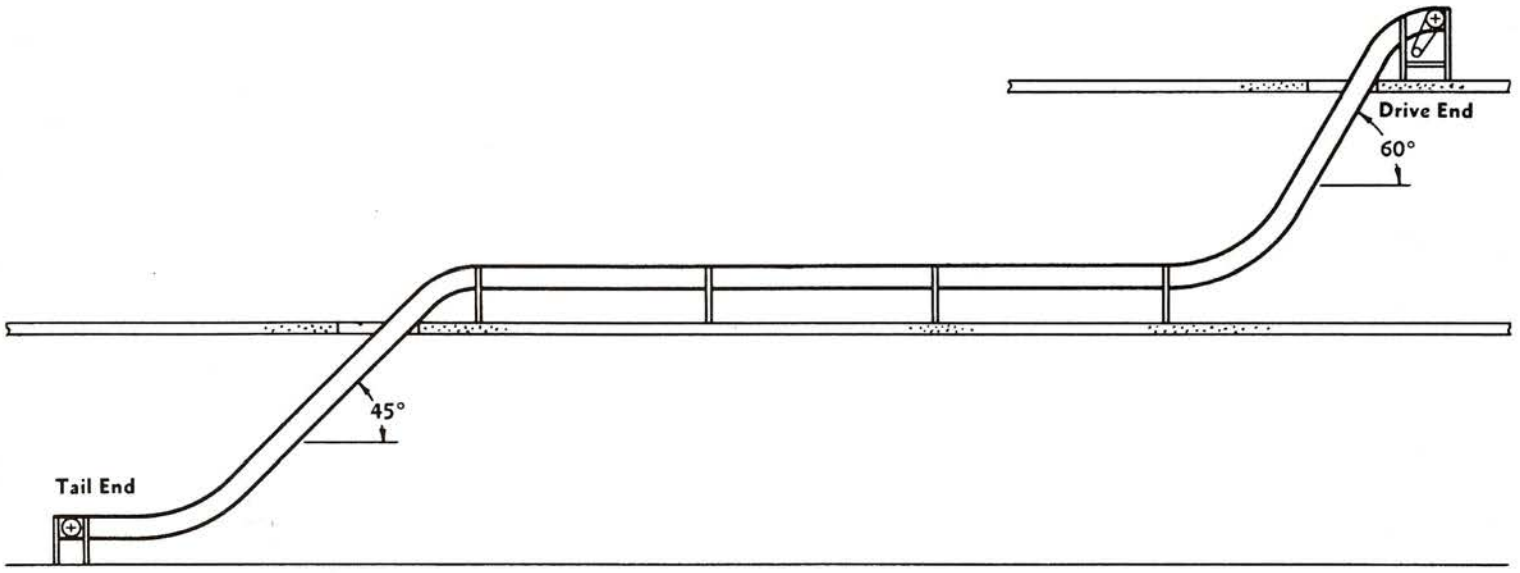


DIAGRAM "E"

General

Pusher Bar Conveyors are generally used for elevating from lower to upper floors. Recommended where base length available will not permit using Inclined Belt or Slat Conveyors. They may be used independently or in connection with Roller Conveyor at receiving and discharge ends.

Pusher Bar Conveyors are designed to receive packages automatically at low end from connecting line. A flat steel spring arrangement holds packages back until they are properly received by pusher. The spring arrangement should be removed when conveyor is reversible or used for lowering. When used for lowering, the packages must be manually loaded and seated firmly against preceding pusher to insure proper handling. A section of roller bed can be furnished at drive end to facilitate loading.

Construction

Pusher Bar Conveyor frames consist of chain track angles with rigid angle bracing and suitable supports. The carrying slide bed is ordinarily of sheet steel with reinforcing steel strips. Roller beds can be furnished where friction is objectionable. Pushers are ball bearing steel roller type at suitable intervals (usually about 4'-0") mounted on two matched strands of Logan steel roller chain. Chains No. 9½ and 954 are standard. (See Apron Conveyor Notes.) Maximum capacity 20 packages per minute.

Inclines of 45° or 60° shown on Page 155 should be used wherever possible. Other inclines can be furnished but involve additional engineering cost.

Cover angles are provided over chain only at low end unless otherwise specified. These act as a safety feature and protection for chain at loading end and also serve as a hold-down track for chain in going around bottom bend.

Ends

Drives shown on Pages 102 and 103 are applicable to Pusher Bar Conveyors. Take-ups are always Type "TB" (See Page 104.)

Loading Pulley

When receiving from Roller Conveyor a loading pulley is usually recommended at tail end. The pulley is mounted between the sprockets on take-up shaft and serves as a feeder. It also helps to fill the gap between end of Roller Conveyor and slide bed. This is particularly desirable when handling short packages.

Applications

The Diagrams shown on Page 156 are typical applications. Diagrams "A" and "B" show the usual 45° and 60° Pusher Bar Conveyors with automatic loading and unloading. Diagrams "C" and "D" show bend at tail end omitted. These require manual loading and are used for elevating only. Discharge can be automatic to connecting conveyor. Diagram "E" shows a combination inclined and horizontal conveyor which can be varied to suit conditions.

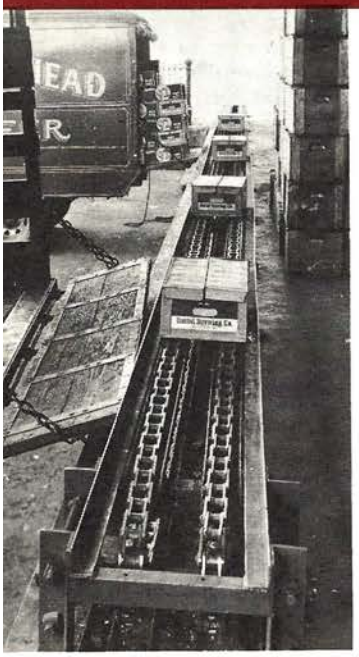
Intermediate Discharge

Intermediate discharge, by means of sliding gates in bed of conveyor can be furnished when required. This construction is known as the Logan "Gate-Bed" Type as shown on Page 154. The gates are usually rack and pinion type, operated by hand wheel or by rag wheel and chain. Can be electrically operated through remote control. Return run of pushers must be snubbed to clear discharge point.

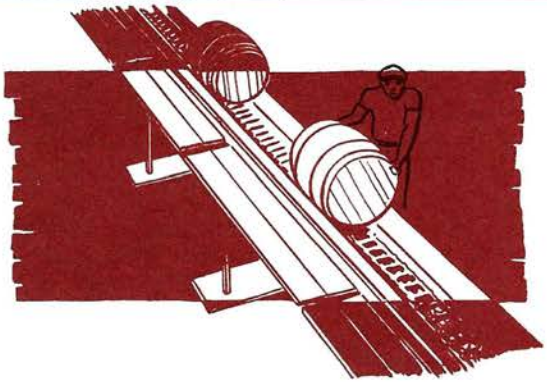
CHAIN CONVEYORS

VARIOUS types of Chain Conveyors can be furnished depending on the handling requirements. The chain may be used either simply to furnish the motive power or to form the actual carrying surface for the material handled. Carrousel type Chain Conveyors are formed by attaching pallets to the chain, permitting the formation of a continuous carrying loop.

LEFT: Views of two Logan Pallet Conveyors used for assembling microscope, erector and other similar sets by toy manufacturer. These conveyors form a loop with chain on inside and pallets attached to chain as shown in upper view. The pallets ride on Roller Conveyor at convenient speed and height for operators in lower view.

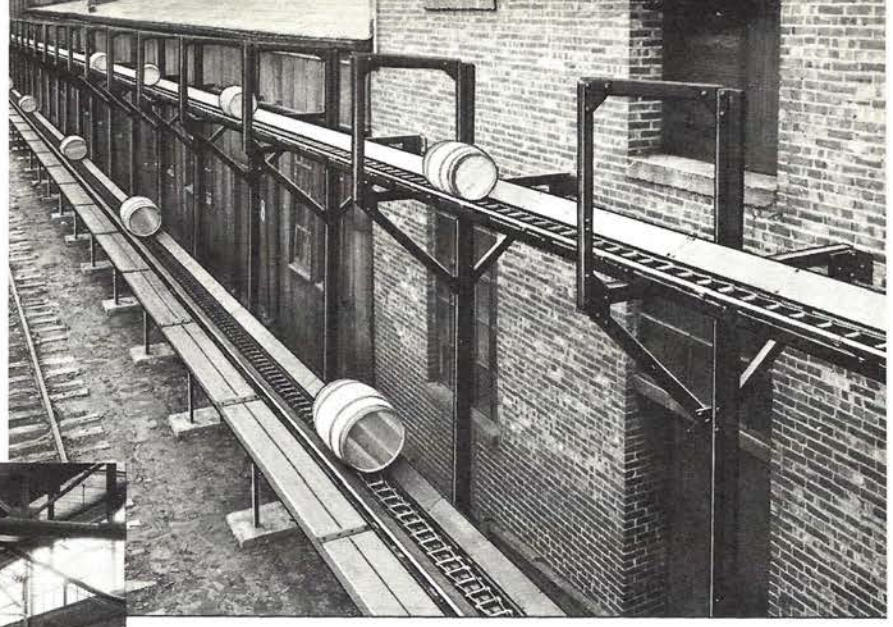


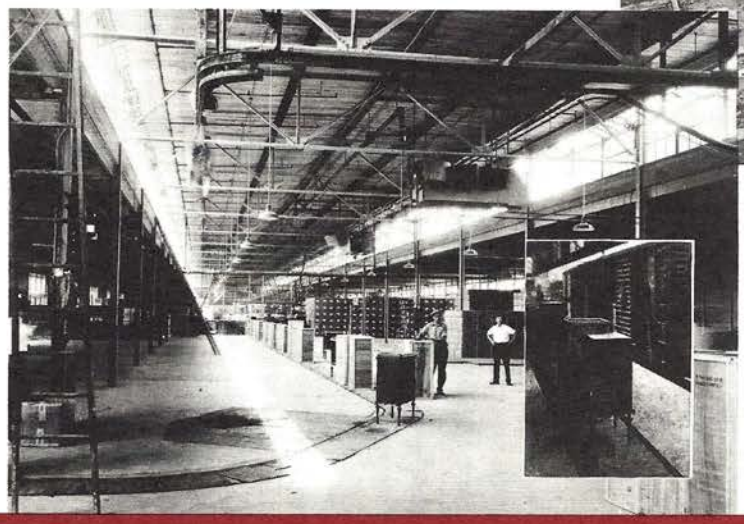
LEFT: A double strand Chain Conveyor installed on truck loading platform of a large brewery. The cases ride directly on the flat surfaced chains. This conveyor is level at convenient loading height. Inclined conveyors of similar construction are frequently used as boosters in long lines of Roller Conveyor. Both carrying and return runs of chain slide in narrow channel runways.



RIGHT: This stove assembly line consists of a double line of Roller Conveyor with chain and pushers in center. The stoves are assembled on the crate bottoms received by Roller Conveyor line at left. Hinged Sections and Ball Transfers aid in transferring crate bottoms and stove parts to assembly line. Ball Transfers inserted in assembly line facilitate discharging stoves to Roller Conveyor leading to storage.

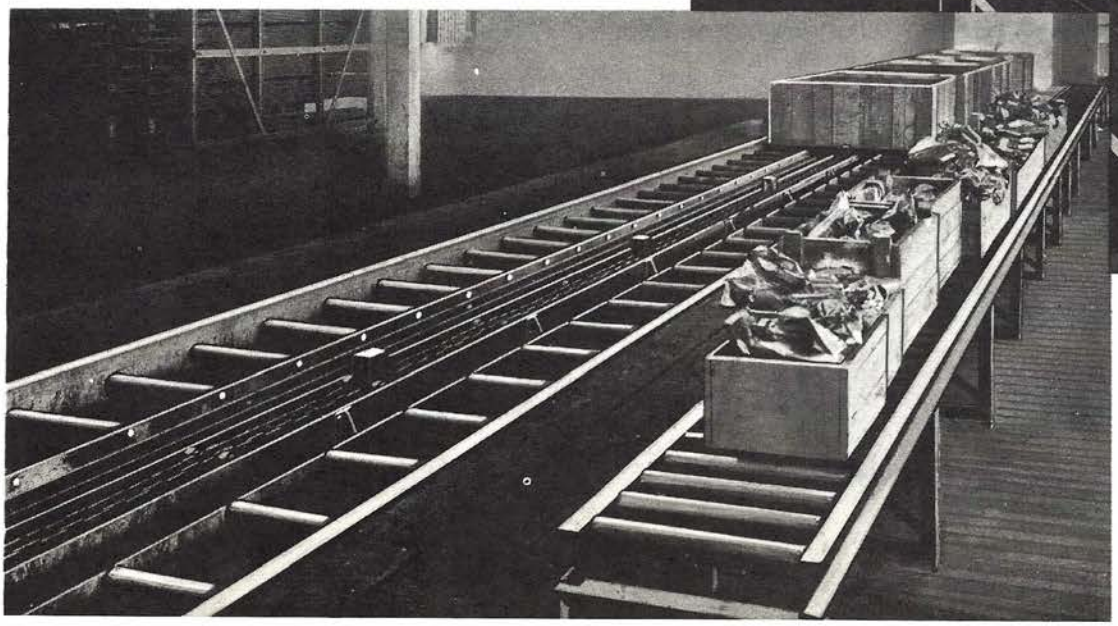
RIGHT: The upper run of this Chain Conveyor handles barrels and kegs from cooperage department on second floor to cooling off storage at opposite end of long building. It connects to similar conveyor extending at right angles into the building. The lower run brings finished barrels from storage or direct from final manufacturing operation to cars. Subsequent to taking photograph, this conveyor was housed in for protection from weather.





LEFT: Logan Pallet Type Carrousel handling radios and serving, receiving, assembling, crating and shipping operations in one continuous cycle. This Carrousel, 800 ft. in length, is built in the form of a great flat-sided oval. Installed flush with floor, it may be walked on or trucked over. Insert shows portion of conveyor along the shipping platform.

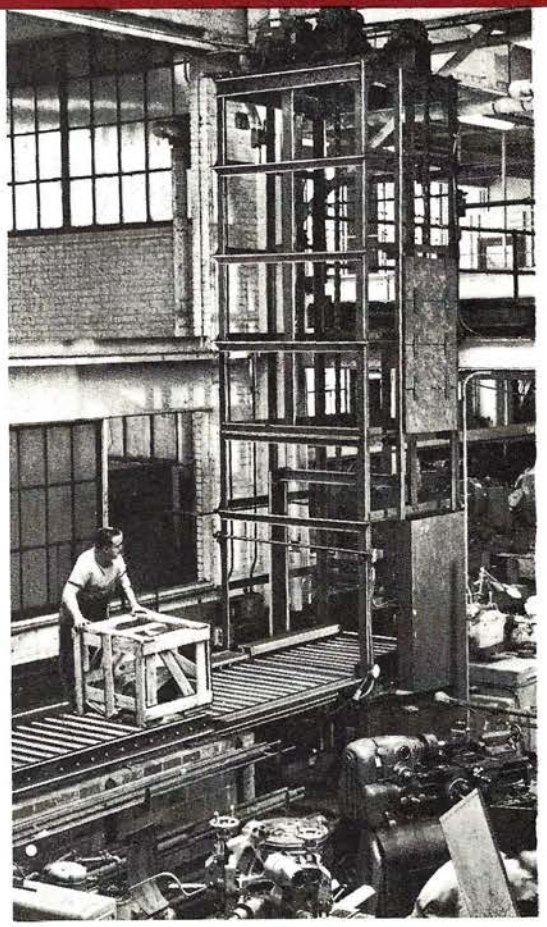
RIGHT AND BELOW: Tractors are crated for export and moved to shipping platform on the double line of Roller Conveyor shown in the views at right and below. The Roller Conveyor is level, and supports the entire weight of crates. A driven chain in the center, with pushers at intervals which bear against bottom edge of crates, furnishes the motive power.

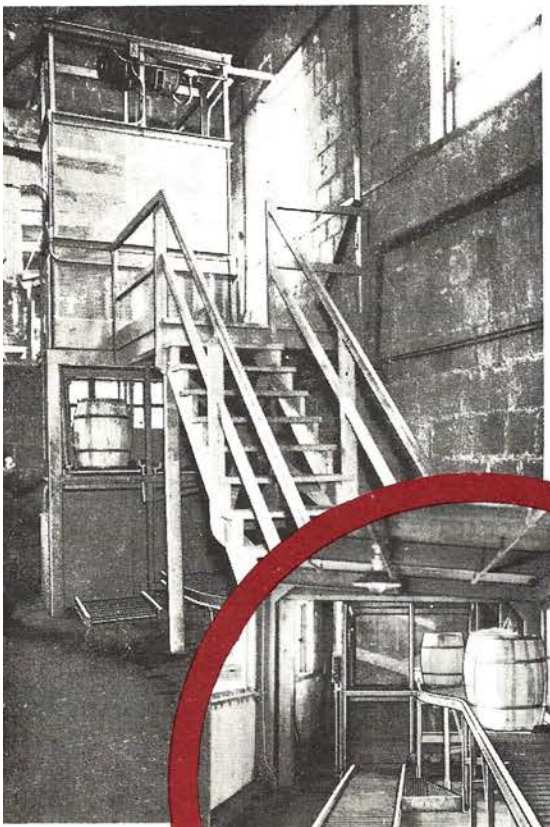


RECIPROCATING CONVEYORS

RECIPROCATING CONVEYORS consist essentially of an electric drive which raises and lowers a carriage operating along suitable guides. This construction is much simpler and cheaper than a continuous chain type of Vertical Conveyor. Vertical Reciprocating Conveyors are recommended where great capacity is not required and may be used either for raising or lowering. While ordinarily there is only one loading and one discharge point, intermediate stations can be provided if required.

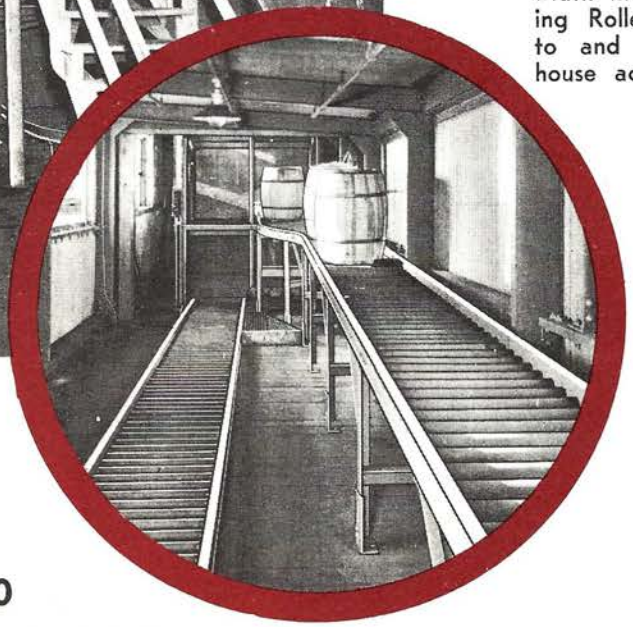
ABOVE: Reciprocating Conveyors frequently serve different elevations on same floor. This unit lowers lock nuts in tote pans from overhead Gravity in rear to low-level line in foreground.





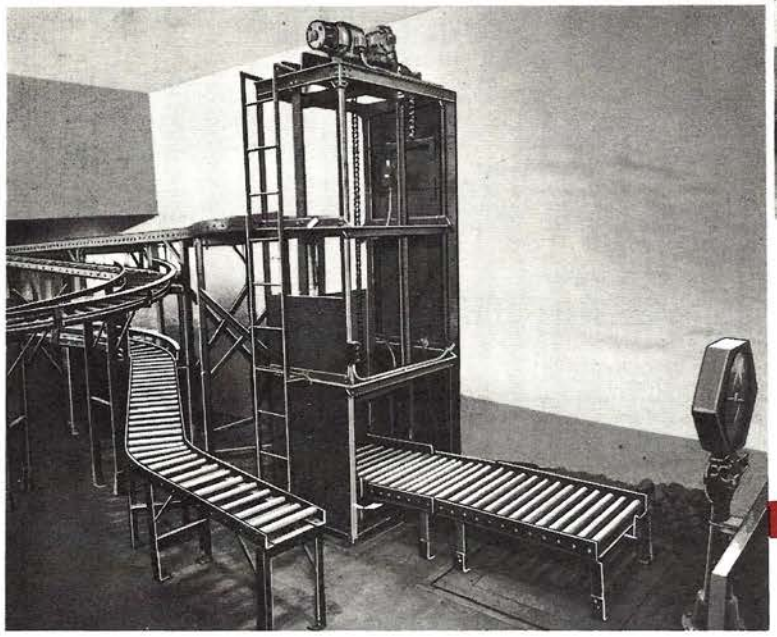
LEFT: A double width Reciprocating Conveyor handling barrels of color pigment. Left-hand side used for elevating barrels to Gravity line leading to warehouse, and right-hand side for lowering from return Gravity line from warehouse. The capacity here is two barrels per minute in each direction.

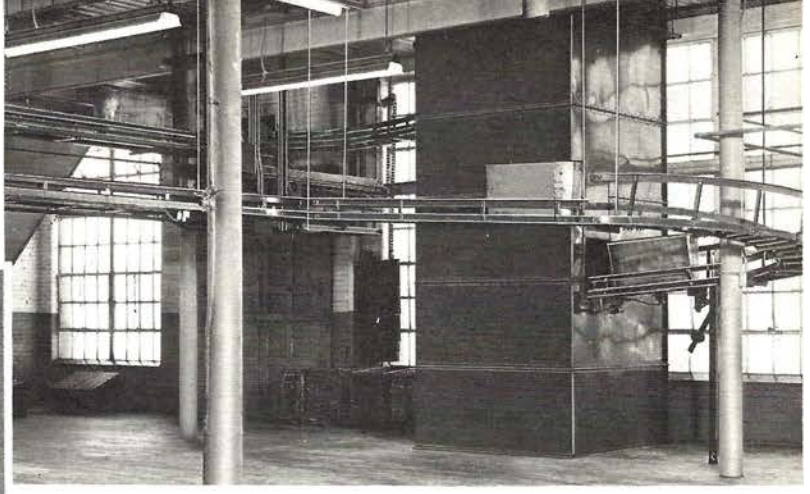
IN CIRCLE: Top end of above double width machine showing Roller Conveyor to and from warehouse across bridge.



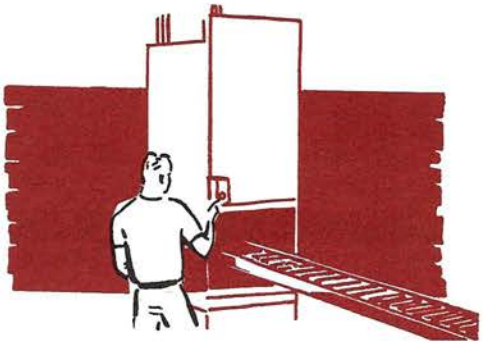
ABOVE: This Reciprocating Conveyor handles crated motors to and from storage area on balcony. Unit is Counterweighted Type with motor and reducer drive. Operation is fully automatic with power driven carriage bed and powered loading and unloading stations. Cycle is reversed by means of selector switch.

BELOW: Castings from foundry are delivered in tote pans via Roller Spiral at left. From here they are transferred to Scale Section for weighing. Then shoved onto Reciprocating Conveyor and raised to upper level Roller Conveyor line for delivery to machining operations.

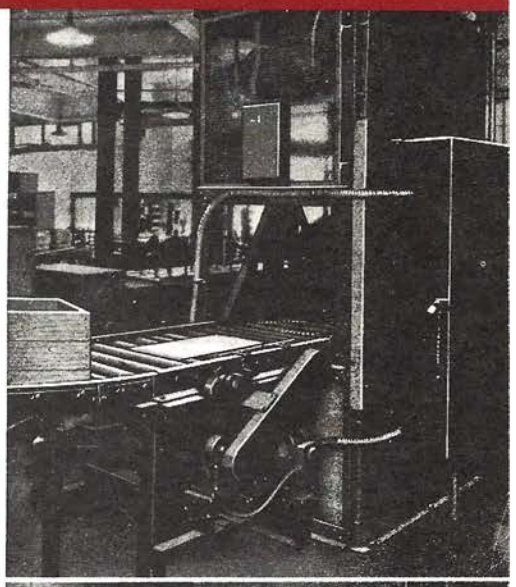


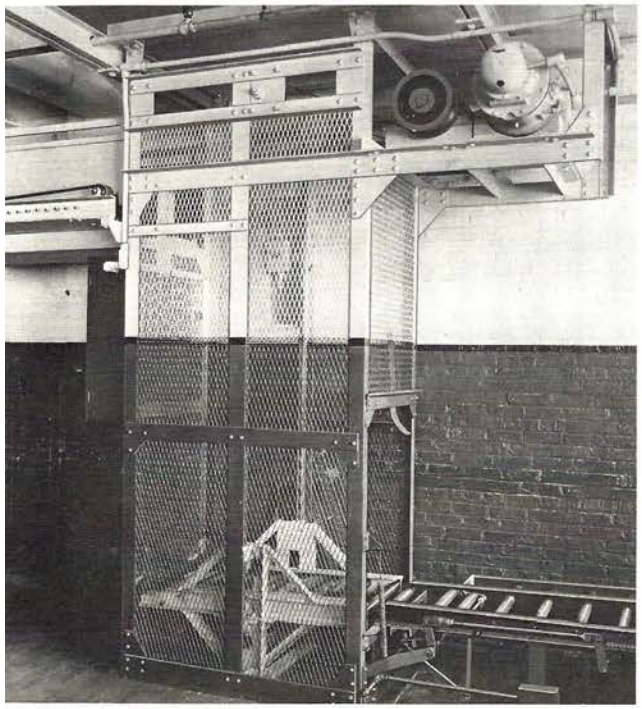


ABOVE: Vertical Reciprocating Conveyor forming an integral part of a Logan Conveyor system in large textile mill. Full tubs of filling are lowered from fourth floor spinning room to second floor weave room and empty tubs are returned to fourth floor. View shows lines leading to and from Reciprocating Conveyor at second floor.

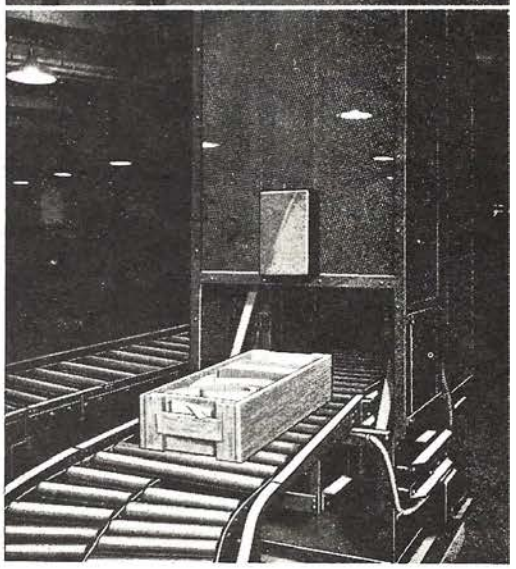


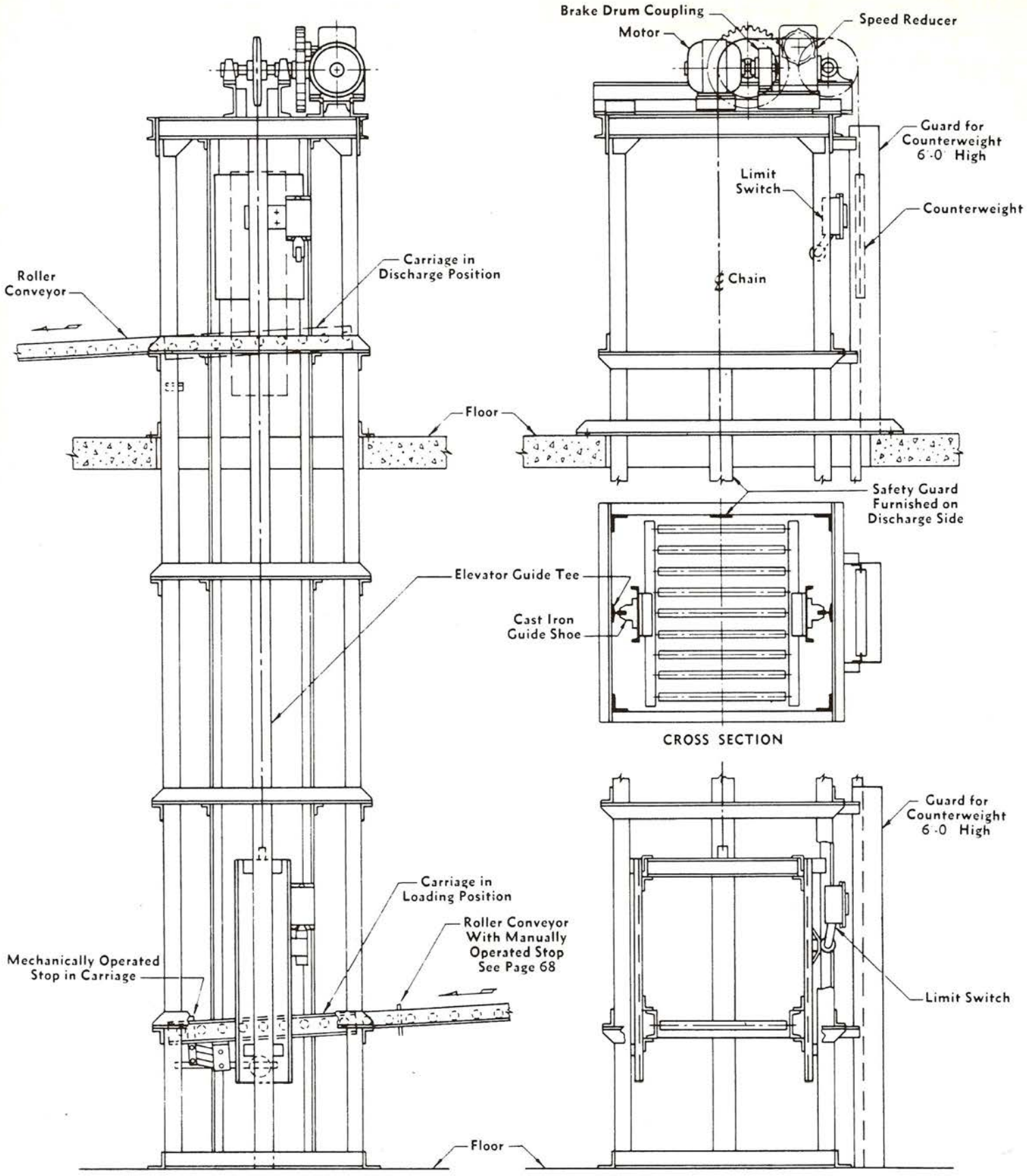
RIGHT: The Reciprocating Conveyor lends itself readily to automatic loading and unloading. This machine raises and lowers pallets or boxes of grinding wheels. These move onto loading station via Roller Conveyor and the carriage automatically picks up load and delivers it to unloading station. Carriage returns automatically to loading station shown in lower view.





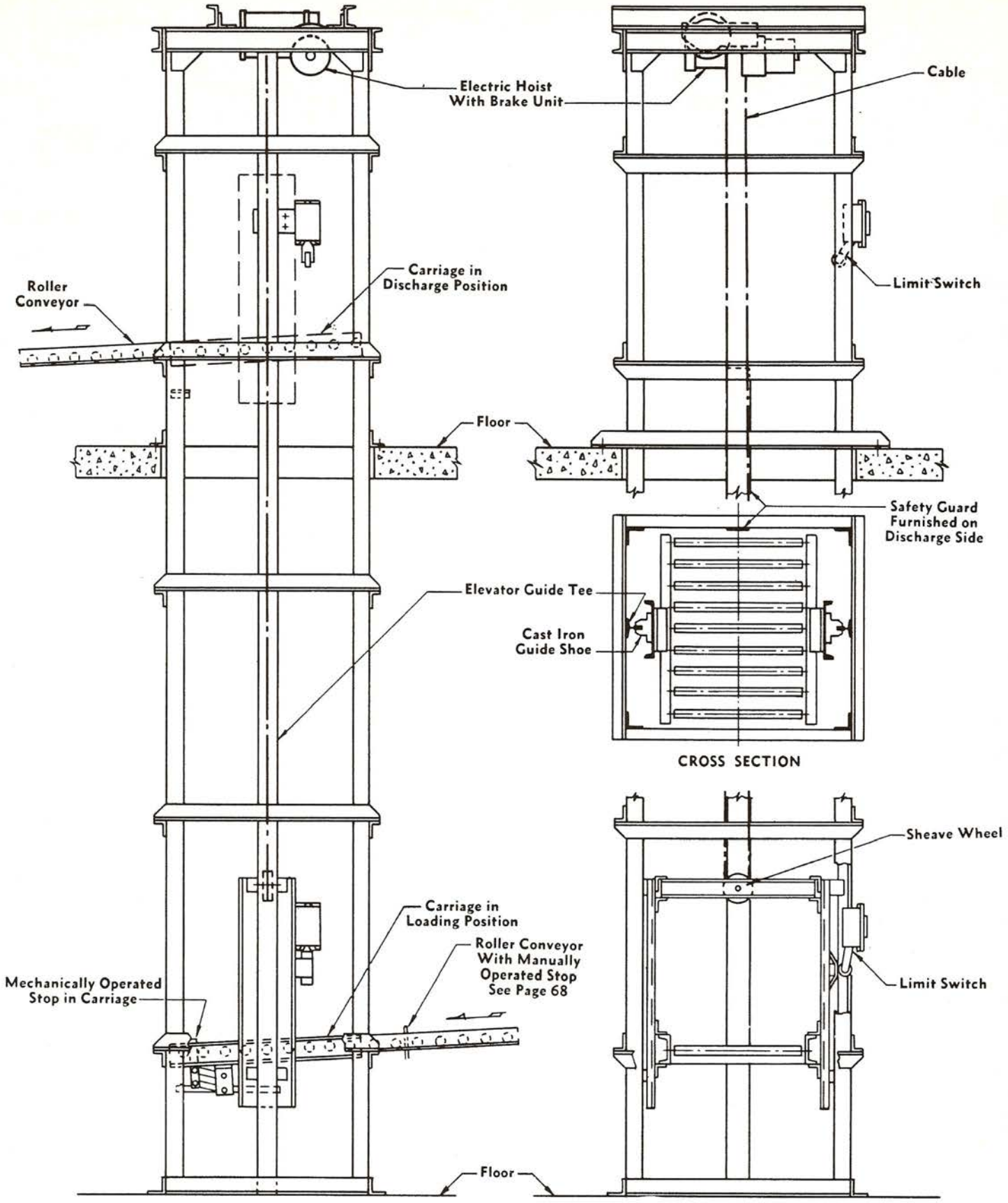
LEFT: A Reciprocating Conveyor with electric hoist drive mounted at one side conserves head room. Unit handles electrical parts in tote pans received automatically from lower Gravity line and discharged automatically to overhead line at left. Operating cycle is controlled by signal rolls in loading and unloading stations.





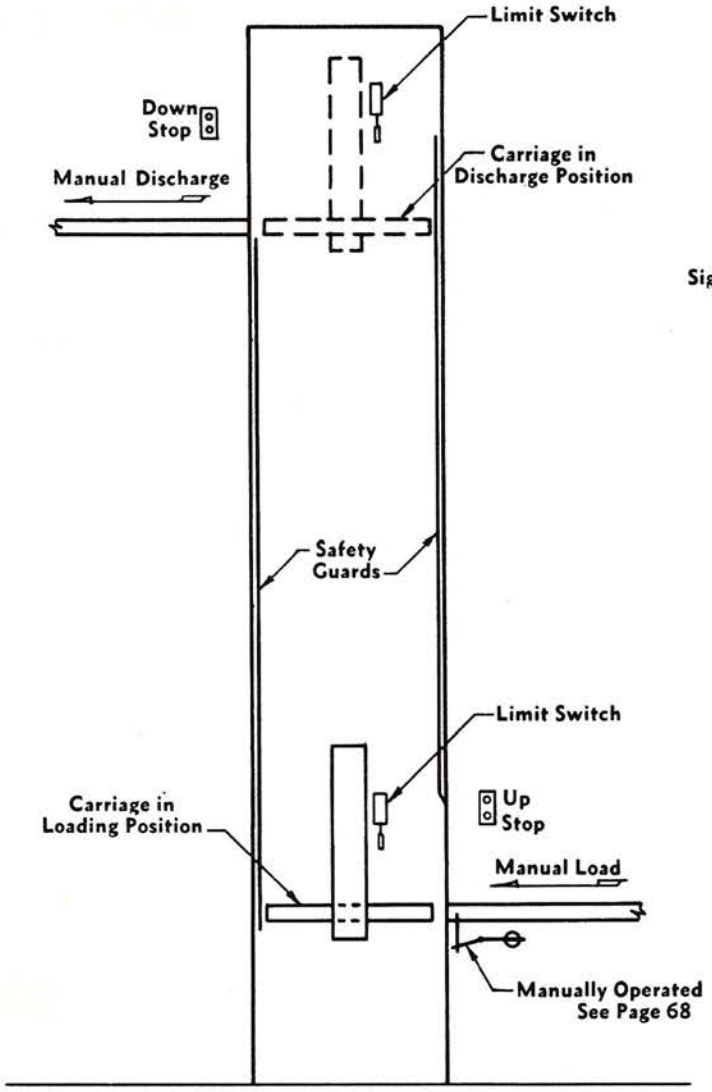
STYLE 1—COUNTERWEIGHTED

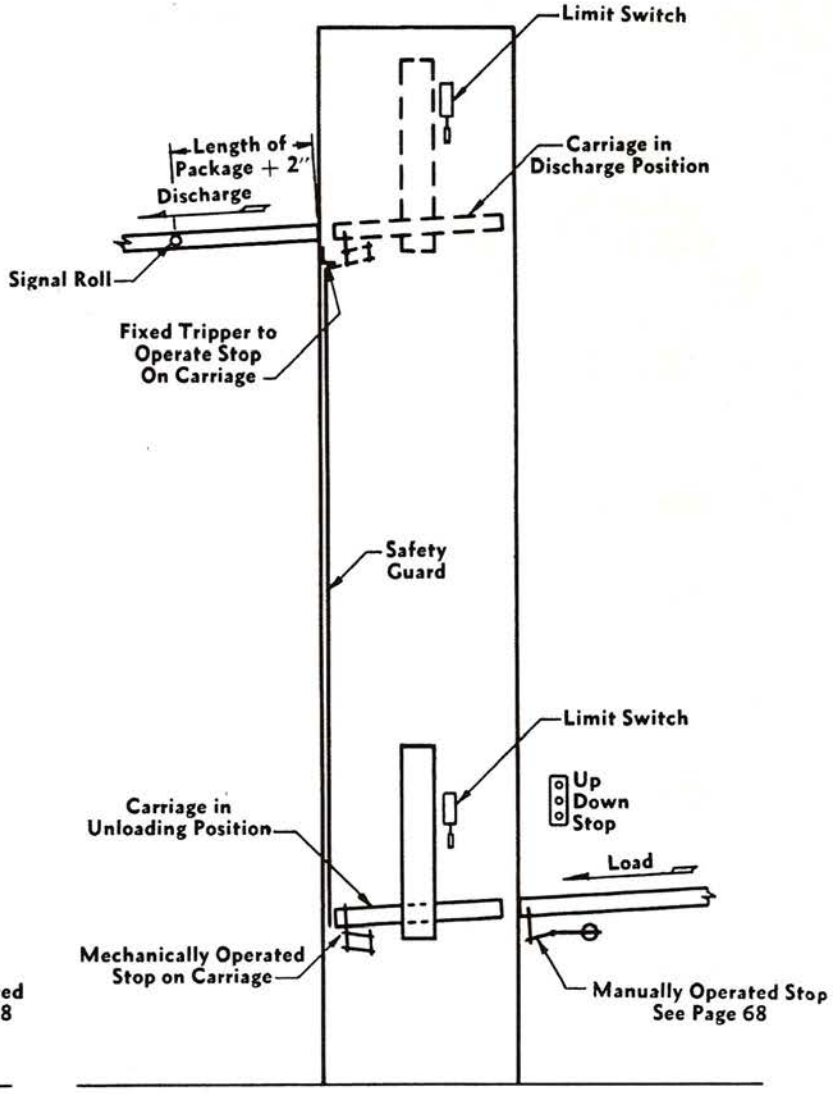
Motor and Reducer Drive



STYLE 2—NOT COUNTERWEIGHTED

Electric Hoist Drive





TYPE "A" OPERATION

Push Button Start and Push Button Return of Lift Carriage

OPERATING CYCLE

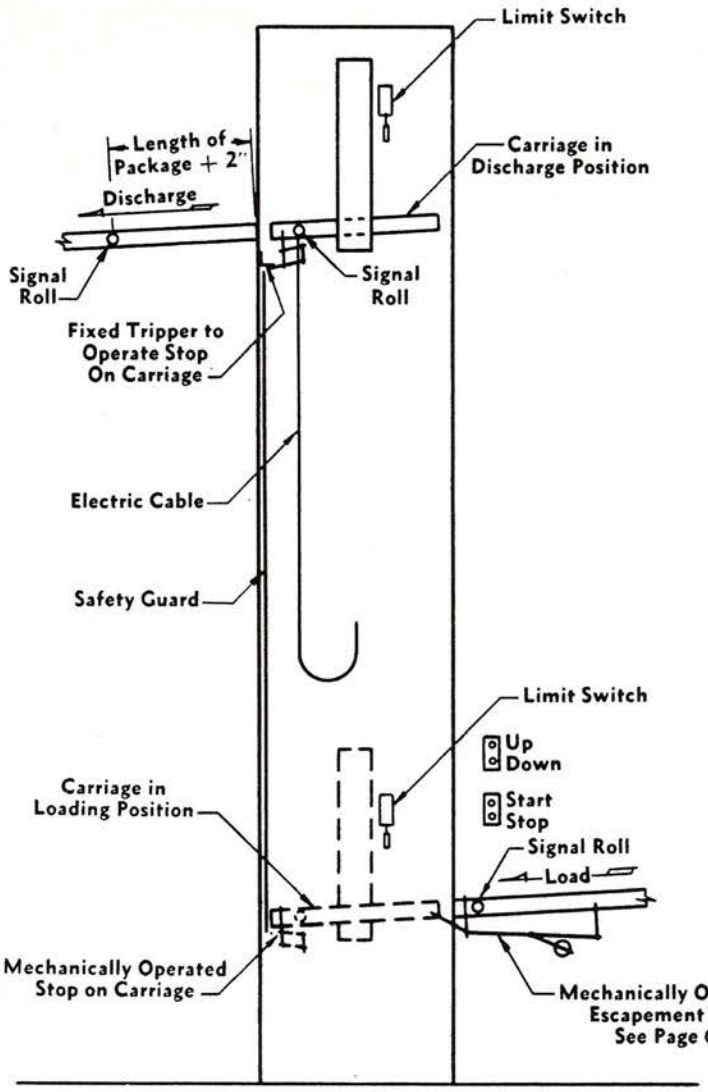
This type requires manual loading and unloading. Loading operator presses push button to start carriage which stops automatically at unloading station. Unloading operator then presses similar button to return carriage which completes the operating cycle. Emergency stop buttons are provided for both operators. Package stops in loading line are optional. Applicable for either elevating or lowering and can be used for two-way service.

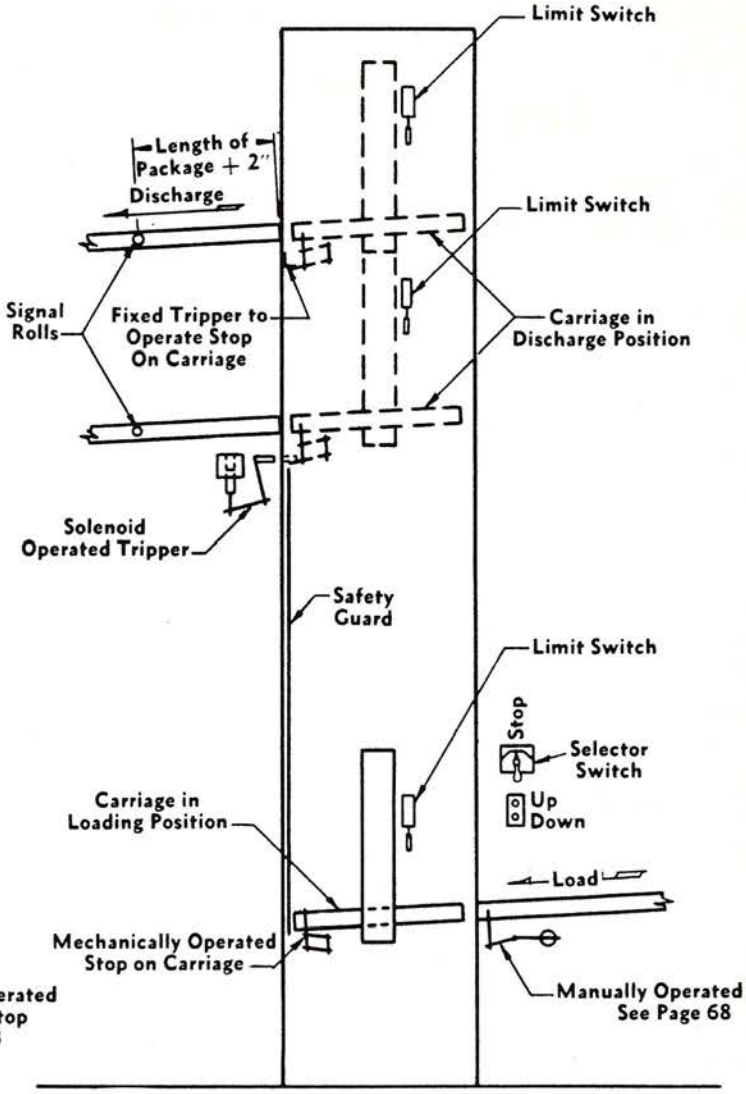
TYPE "B" OPERATION

Push Button Start and Automatic Return of Lift Carriage

OPERATING CYCLE

This type requires manual loading with automatic unloading. Loading operator presses push button to start carriage which stops and automatically unloads at unloading station. When discharging package clears signal roll in discharge line, the carriage automatically returns to loading station which completes the operating cycle. Emergency stop and down call buttons are provided for loading operator. Package stops in loading line are optional. Applicable for elevating only but can be designed for lowering by interchanging stations.





TYPE "C" OPERATION

Automatic Start and Automatic Return of Lift Carriage

OPERATING CYCLE

This type has automatic loading and unloading. Lift carriage is equipped with signal roll which is operated by the package to start carriage. The carriage stops and automatically unloads at unloading station and remains until package clears signal roll in discharge line. It is returned to loading position only when following package operates a signal roll in loading station which completes the operating cycle. Loading line is equipped with escapement stop which is automatically operated by carriage. Start and stop buttons are provided to energize controls and up and down buttons for emergency operation. Applicable for elevating only but can be designed for lowering by interchanging stations.

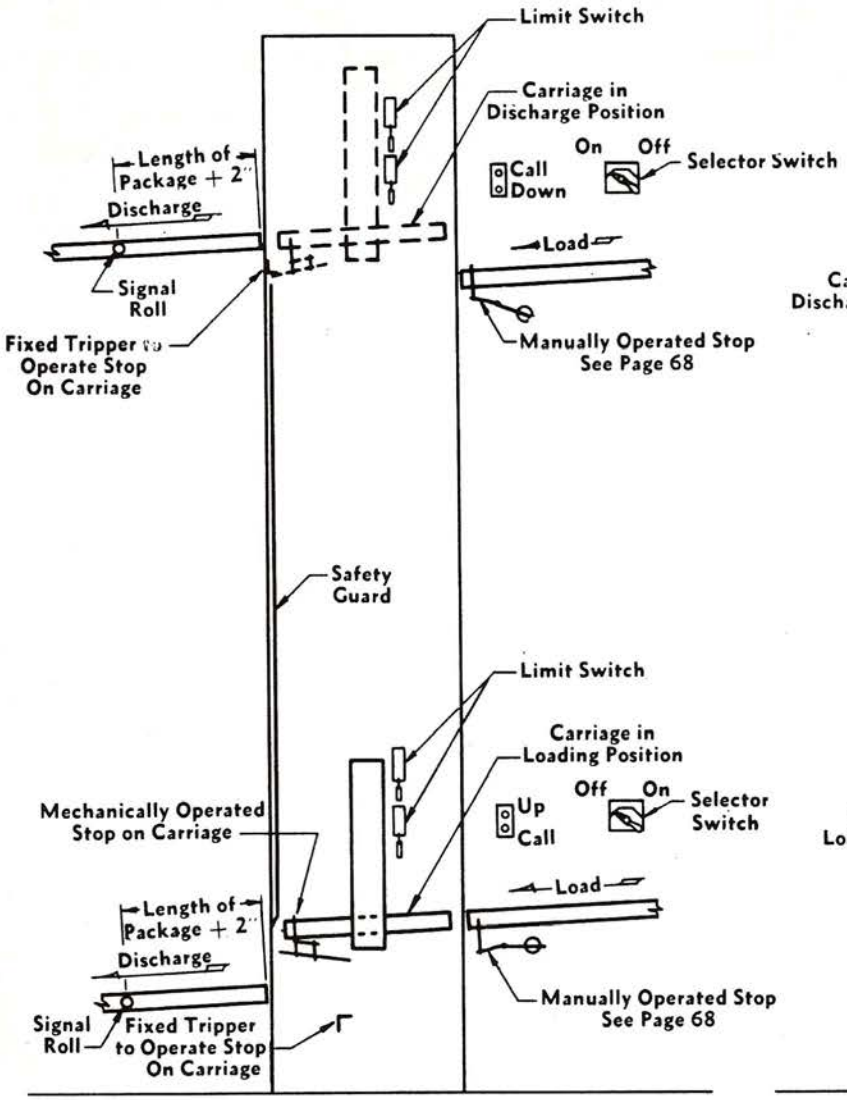
TYPE "D" OPERATION

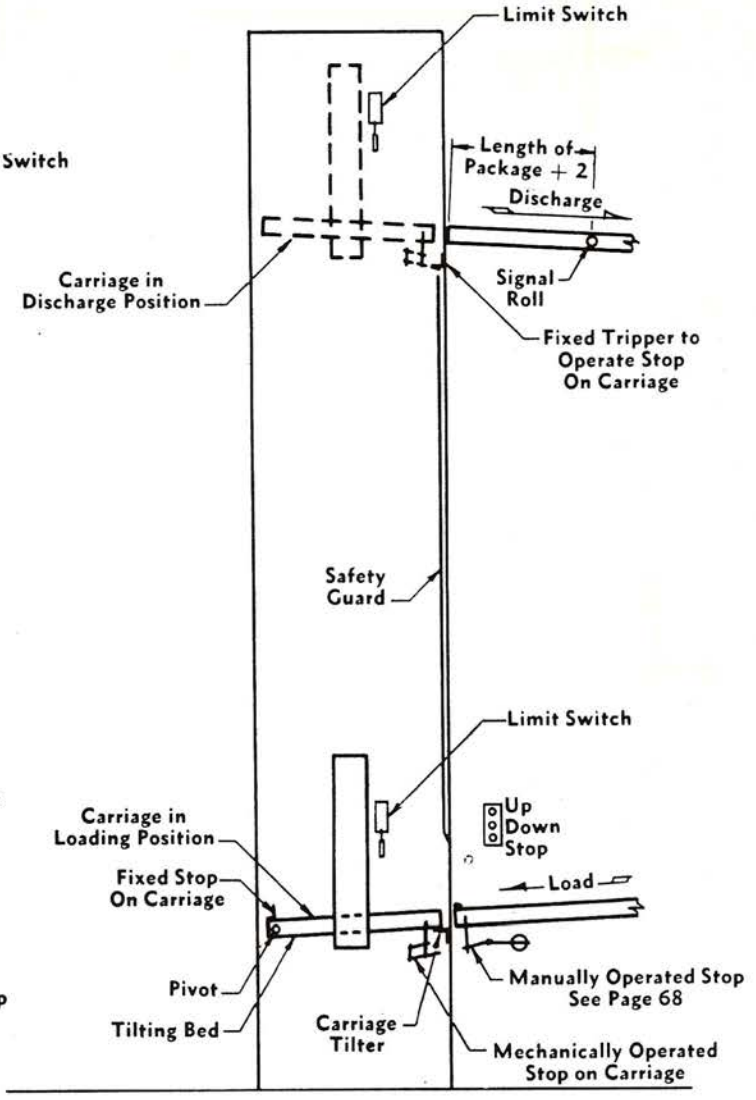
Same as Type "B" With Intermediate Unloading Station

OPERATING CYCLE

Operating cycle is the same as in Type "B" except that discharge at either of two unloading stations is controlled by selector switch. At intermediate unloading station a solenoid tripper operates stop on carriage or permits by-pass to upper station. Applicable for elevating only but can be designed for lowering by interchanging top and bottom stations. Additional discharge stations can be served by adding additional solenoid trippers and increasing number of positions on selector switch.

Multiple station discharge can also be applied to Types "A", "C" and "F" operation.





TYPE "E" OPERATION

Same as Type "B" Except Designed for Two-Way Service

OPERATING CYCLE

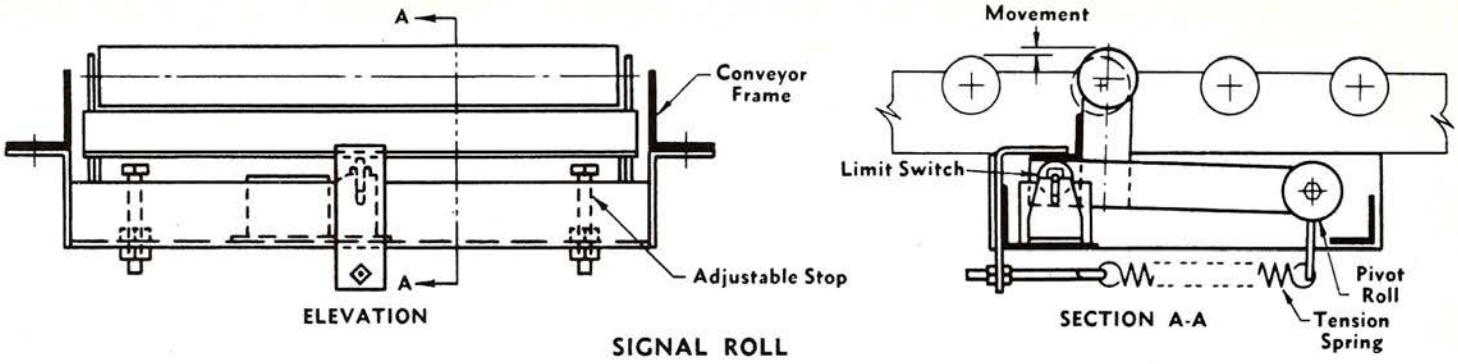
Operating cycle is the same as in Type "B" except that cycle for either elevating or lowering is controlled by selector switches. Stations should be offset with unloading stations in extreme positions as shown to avoid additional control equipment.

TYPE "F" OPERATION

Same as Type "B" Except With Both Stations on Same Side

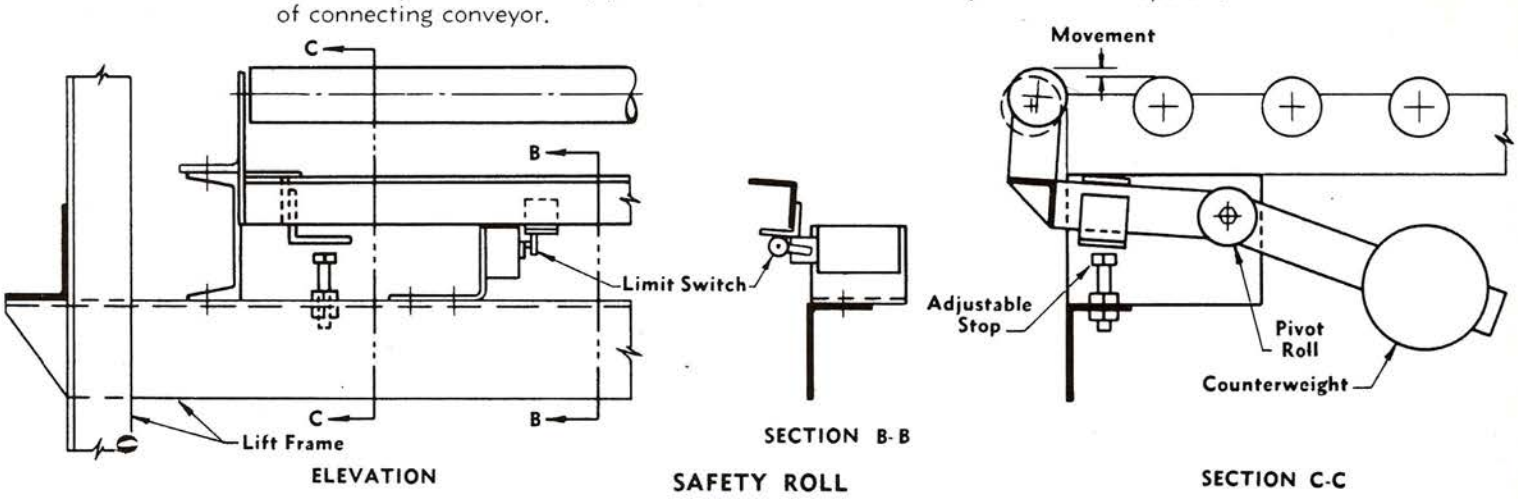
OPERATING CYCLE

Operating cycle is the same as in Type "B". Carriage has a tilting bed to permit loading and unloading on same side of Lift. Bed of carriage is normally pitched for unloading and is tilted automatically for receiving at loading station. Applicable for elevating only but can be designed for lowering by reversing tilting cycle.



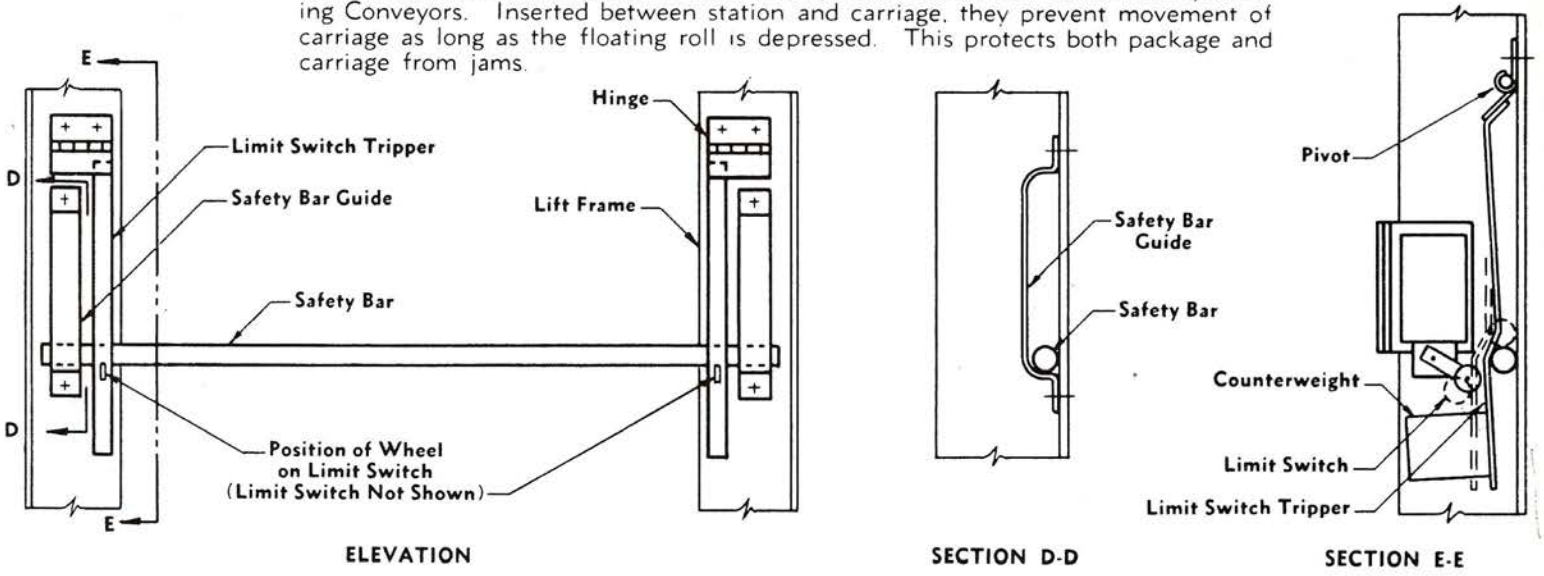
SIGNAL ROLL

Signal Rolls consist of a floating roll and limit switch in a self-contained unit. The limit switch is operated automatically by package depressing floating roll. These units can be inserted at any point in a line of Roller Conveyor to control operation of connecting conveyor.



SAFETY ROLL

Safety Rolls consist of a floating roll and limit switch with necessary framing These units are recommended for manually operated stations on Vertical Reciprocating Conveyors. Inserted between station and carriage, they prevent movement of carriage as long as the floating roll is depressed. This protects both package and carriage from jams.



SAFETY BARS

Safety Bars consist of a floating bar with limit switch and tripper at each end. Tripping of either limit switch by movement of bar makes control circuit inoperative until bar is reset. Recommended for manually operated stations on Vertical Reciprocating Conveyors. They protect both package and carriage from possible jams and also provide protection for operator.

General

Vertical Reciprocating Conveyors have a more flexible field of application than any other type of elevating conveyor. They can be designed to handle larger and much heavier packages although the capacity in number of packages is lower. They consist essentially of a drive which raises and lowers a carriage traveling in suitable guides. Available in various types for elevating or lowering and for two-way service. The types of operation shown on Pages 164 to 166 feature the more common applications. Other types or variations of types shown can be furnished to meet special applications.

When package is properly seated on carriage, the carriage is started (either automatically or by push button) and automatically comes to rest at discharge point. Package is then discharged manually or automatically onto an unloading conveyor. The carriage is sometimes returned to loading station by push button, but normally the discharged package depresses a signal roll (see Page 167) in the unloading conveyor which closes an electric circuit to automatically return the carriage. The signal roll is designed so that it also acts as a safety feature in the event unloading conveyor line is filled.

Drives

Vertical Reciprocating Conveyors are furnished with either motor and reducer drive or electric hoist drive. The motor and reducer drive (see Page 162) is generally recommended. This type permits a wider range of speeds than the electric hoist drive and consequently is more readily adaptable to speed and capacity desired. This type also has a counterweighted carriage thus requiring less horsepower. The electric hoist drive (see Page 163) is usually lower in first cost but is ordinarily only suitable for handling light loads at normal speeds or heavy loads at slow speeds.

On both styles of drives the distance of carriage travel is controlled by limit switches. These are mounted on adjustable brackets to permit field adjustment of travel at both loading and discharge positions. Suitable brake units are included in drives to stop carriage and hold it in position while loading or discharging. Over-travel limit switches can be provided for added safety where required.

Air-Operated Types can be furnished where air is available. This type is practical only for short lifts.

Speed and Capacity

The maximum speed normally recommended should not be over 60 F.P.M. Within this speed range the stopping of carriage can be held to reasonably close limits. The time required for a complete cycle depends upon the speed, distance of travel, and time required for loading and discharging. The number of cycles usually ranges up to a maximum of 2 per minute for average one-floor service.

For heavy loads or higher speeds a motor with a slow-down speed arrangement is recommended. This permits a higher intermediate speed with a slow-down at both ends to decrease momentum and facilitate leveling of carriage with stations.

Carriage

The size and construction of carriage can be varied to suit operating conditions. The carriage is usually equipped with a roller bed to facilitate loading and discharging and is always required for automatic operation. The bed of carriage is set level for manual operation and on a slope for automatic operation. Where load and discharge stations are on same side a pivoted bed is required. Suitable stops are provided as required to hold package while carriage is in motion.

Multiple width or multiple deck carriages can be furnished in some cases to increase capacity. Bed of carriage can be powered to speed loading and discharging operations, also for level bed carriage where two-way service is required.

Frame

The frame consists essentially of two vertical machined elevator guide tees with four corner supporting angles and a suitable mounting for drive. Each side of carriage is equipped with two cast iron guide shoes which engage the guide tees. This provides smooth operation with a minimum amount of play. The corner angles are tied to reinforce guide tees and form a rigid supporting frame. They also serve as a guard for moving carriage.

On the counterweighted type the frame includes angle guides for counterweight and 6'-0" high sheet steel counterweight guards at each floor.

Stations

Ordinarily there is only one loading and one discharge station, but intermediate stations can be provided if required. Both stations can be designed for either manual or automatic operation. With automatic loading the type of escapement stop required depends upon size and shape of package.

The stations are usually pivoted to permit automatic alignment of floating end of station with carriage. This feature is always recommended except for occasional slow speeds and light loads. It also requires less frequent brake adjustment.

When bed of carriage is powered the stations are normally powered and are reversible for two-way service.

Safety Features

See Signal Rolls. Safety Rolls and Safety Bars shown on Page 167. A carriage locking device can be furnished if desired. This prevents carriage from falling in the event of chain or cable failure.

BELT CONVEYOR
HORSE POWER FORMULA

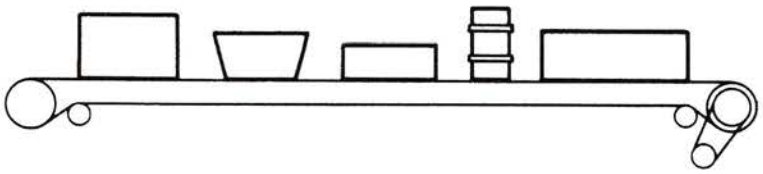
When computing the horsepower required for driving a Belt Conveyor, it is necessary first to determine the total belt pull. This is based upon the live load and the weight of all moving parts multiplied by the coefficient of friction which varies with the type of carrying surface supporting the belt.

The following paragraphs outline the procedure for figuring the belt pull for each of the above items and list the percentage additions for special features and drive unit. Follow typical examples in arriving at total horsepower of motor.

A – LIVE LOAD

This is the weight of material handled on conveyor and should be figured for total length of conveyor under maximum loading conditions.

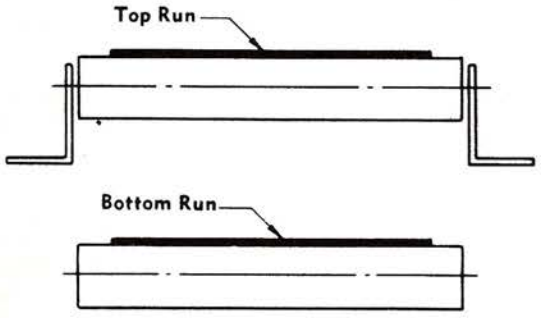
Belt Pull = Total Live Load × C. of F. for Carrying Run of Belt



B – WEIGHT OF BELT

Include weight of both top and bottom runs of Belt from table shown below. Figure separate weights for each run when they take different coefficients of friction.

Belt Pull = Total Weight of Top Belt × C. of F. for Carrying Surface Plus Total Weight of Bottom Belt × C. of F. for Return Run



WEIGHTS OF BELTING – LBS. PER SQ. FT.				
	Rubber Covered		Canvas Stitched	
	3 Ply	4 Ply	3 Ply	4 Ply
24 Oz. Duck		1.3		
28 Oz. Duck	1.3	1.6		1.0
32 Oz. Duck		1.7	1.0	1.1
37½ Oz. Duck				1.3

C – WEIGHT OF ROLLERS

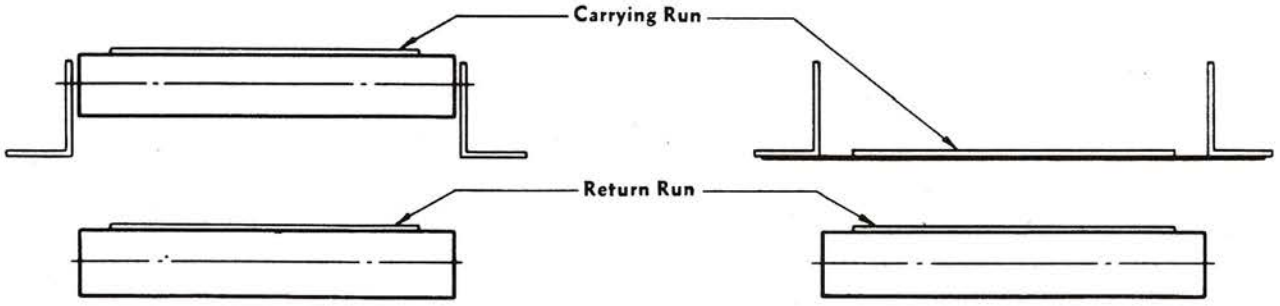
Use total weight of all Carrying Rolls and Return Rolls. On slider bed construction, figure Return Rolls only. Include the weight of all Rollers used as snubs. See table below.

Belt Pull = Total Weight of all Rollers × C. of F. for Rollers

ROLLER WEIGHTS – IN POUNDS																
Roller Size	6″	10″	12″	14″	16″	18″	20″	22″	24″	26″	28″	30″	32″	36″	38″	44″
No. 1—1″ Dia.	.3	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.0	2.3
No. 3—1.9″ Dia.	1.6	2.3	2.6	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.4	5.7	6.1	6.8	7.1	8.2
No. 5—2¼″ Dia.	1.5	2.0	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.3	5.5	6.3
No. 6—2½″ Dia.	1.8	2.5	2.8	3.2	3.6	3.9	4.3	4.6	5.0	5.3	5.7	6.1	6.4	7.1	7.5	8.6
No. 7—1⅝″ Dia.	1.3	1.8	2.1	2.3	2.6	2.9	3.1	3.4	3.7	3.9	4.2	4.5	4.7	5.3	5.5	6.3
No. 8—2½″ Dia.	2.4	3.5	4.1	4.6	5.2	5.8	6.3	6.9	7.5	8.0	8.6	9.1	9.7	10.8	11.4	13.1
No. 9—2½″ Dia.	3.2	4.4	4.9	5.5	6.1	6.6	7.2	7.7	8.3	8.9	9.4	10.0	10.6	11.7	12.3	14.0
No. 10—2⁹⁄₁₆″ Dia.	4.0	5.5	6.3	7.0	7.8	8.6	9.3	10.1	10.9	11.6	12.4	13.2	13.9	15.4	16.2	18.5
No. 13—3½″ Dia.	4.9	6.7	7.5	8.4	9.3	10.2	11.1	12.0	12.8	13.7	14.6	15.5	16.4	18.1	19.0	21.7
No. 15—3½″ Dia.	8.5	12.0	13.8	15.6	17.4	19.1	20.9	22.7	24.5	26.2	28.0	29.8	31.6	35.1	36.9	42.2
No. 75—4¼″ Dia.	15.0	21.7	25.0	28.4	31.7	35.1	38.4	41.7	45.1	48.4	51.8	55.1	58.4	65.1	68.5	78.5
No. 85—5″ Dia.	25.2	36.1	41.5	46.9	52.3	57.8	63.2	68.6	74.0	79.4	84.9	90.3	95.7	106.5	112.0	128.2

D – COEFFICIENT OF FRICTION

Select coefficients from corresponding cross sections shown below. The percentages listed are for canvas or rubber impregnated belting. For rubber covered belts increase coefficient to 70% on slider bed runs where rubber covering is in contact with sliding surface – not recommended.



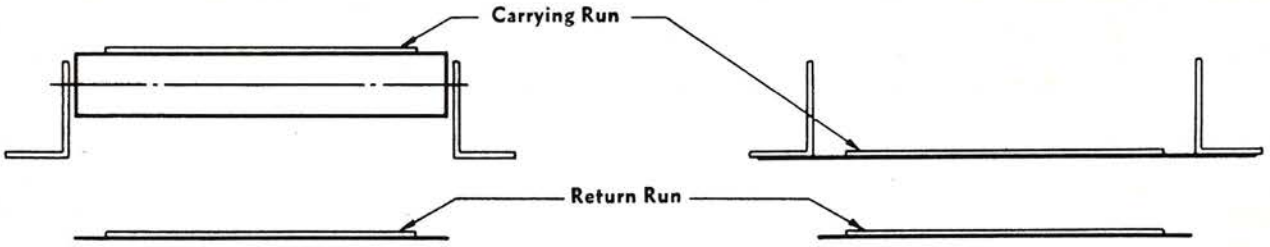
1—ROLLER BED WITH ROLLER RETURN

	C. of F.
Ball Bearings	5%
Bronze Bearings	15%

2—SLIDER BED WITH ROLLER RETURN

	C. of F.
Wood Slider Bed	25%
Steel Slider Bed	30%
Return Run	5%

D – COEFFICIENT OF FRICTION – Cont.



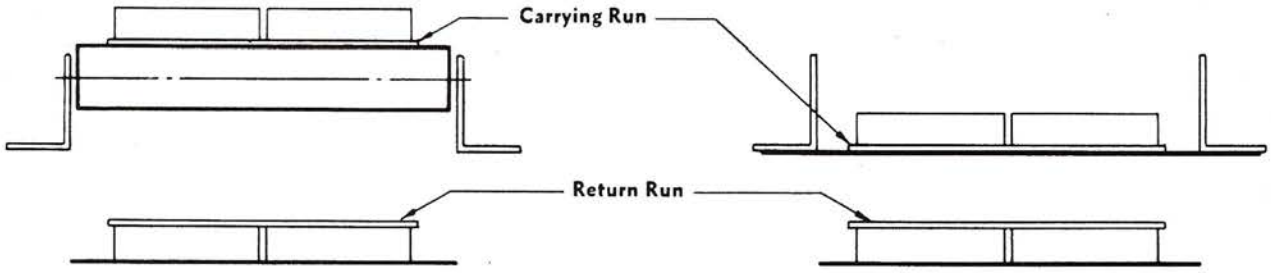
3—ROLLER BED WITH SLIDER RETURN

	C. of F.
Carrying Run	Same as 1
Wood Slider Return	25%
Steel Slider Return	30%

4—SLIDER BED WITH SLIDER RETURN

	C. of F.
Carrying Run	Same as 2
Wood Slider Return	25%
Steel Slider Return	30%

If Belt returns with a Rubber Covered Surface next to Slider Bed use C. of F. of 70%. (This condition should be avoided.)



5—ROLLER BED WITH CLEATS ON SLIDER RETURN

	C. of F.
Carrying Run	Same as 1
Return Wood on Wood	40%
Return Steel on Wood	40%
Return Steel on Steel	30%

6—SLIDER BED WITH CLEATS ON SLIDER RETURN

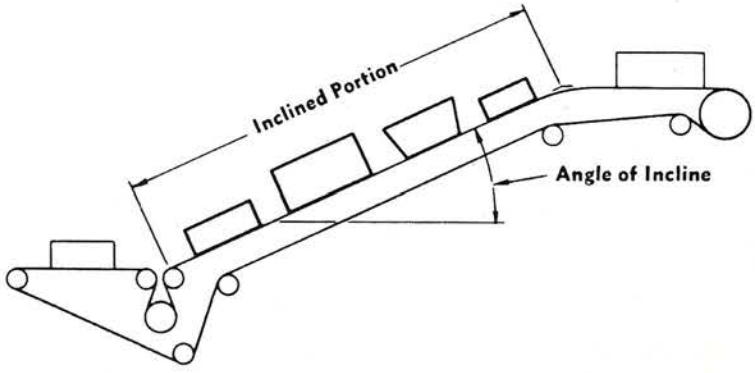
	C. of F.
Carrying Run	Same as 2
Return	Same as 5

E – INCLINES

When all or part of conveyor is inclined additional belt pull is required. Follow the preceding steps and in addition add the weight of material on incline multiplied by the sine of angle of incline from table shown below. Add for declines the same as for inclines.

Belt Pull = Live Load on Incline × Sine of Angle of Incline

SINE OF ANGLE OF INCLINE					
Angle	Sine	Angle	Sine	Angle	Sine
1	.02	11	.19	21	.36
2	.03	12	.21	22	.37
3	.05	13	.23	23	.39
4	.07	14	.24	24	.41
5	.09	15	.26	25	.42
6	.10	16	.28	26	.44
7	.12	17	.29	27	.45
8	.14	18	.31	28	.47
9	.16	19	.33	29	.48
10	.17	20	.34	30	.50

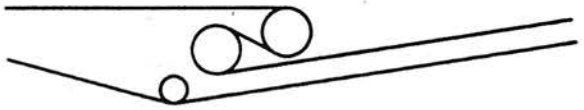


F – TWO AND THREE PULLEY BENDS, ETC.

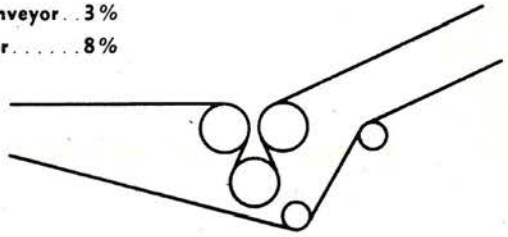
The flexing of belting around pulleys requires additional belt pull. The percentages listed below show amounts to be added for bends and other special features not included elsewhere. Each item should be figured as the percentage of the total intermediate belt pull or sum of items A, B, C, and E.

Belt Pull = (A + B + C + E) × % listed below

Two or three pulley bend near receiving end of conveyor	**3%**
Two or three pulley bend near discharge end of conveyor	**8%**
Two or three pulley bend on reversible conveyor	**8%**
Take-up in drive frame, non-reversible conveyor	**3%**
Take-up in drive frame, reversible conveyor	**8%**
Intermediate take-up in tail frame, non-reversible conveyor	**3%**
Intermediate take-up in tail frame, reversible convevor	**8%**



TWO PULLEY BEND

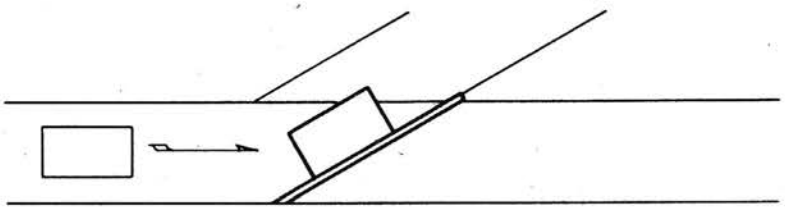


THREE PULLEY BEND

G – DEFLECTORS

Belt pull required for each Deflector equals 30% of weight of heaviest package on canvas or rubber impregnated belting and 80% on rubber covered.

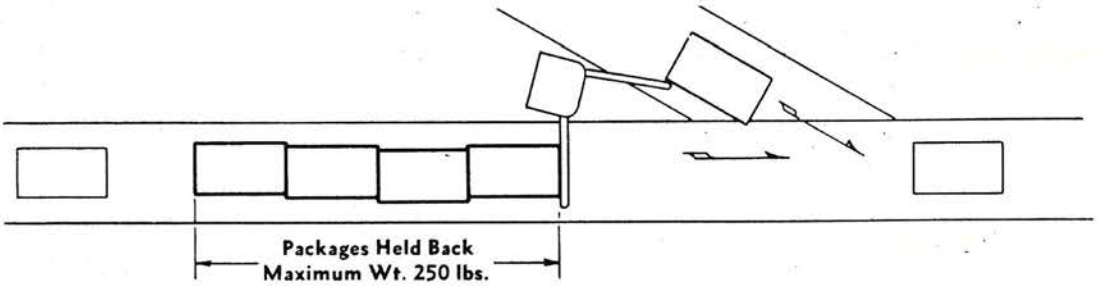
Belt Pull = Weight of Heaviest Package × C. of F. for Belting



H – TRAFFIC COPS

Belt pull required for each Traffic Cop equals 30% of weight of maximum number of packages held back on canvas or rubber impregnated belting and 70% on rubber covered.

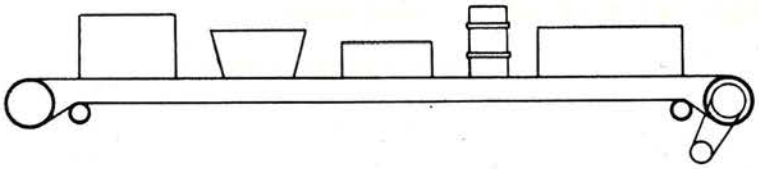
Belt Pull = Total Weight of Packages Held Back × C. of F. for Belting



J – ENDS

Belt Pull required for head and tail pulleys is calculated by multiplying the sum of items A, B, C, E, F, G, and H by 15%. Omit items not applicable.

Belt Pull = (A + B + C + E + F + G + H) × 15%



K – BELT PULL AT HEADSHAFT

This is the sum of the belt pull for all preceding items.

EXAMPLE 1

Horizontal Belt Conveyor with Roller Bed and Roller Return

Assume Conveyor to handle Live Load of 2000 pounds with canvas stitched Belt weighing 250 pounds supported on ball bearing Rollers weighing 400 pounds. Included are one Deflector and one Traffic Cop to hold back a maximum of 5 packages weighing 50 pounds each.

A–Live Load	2000 × 5% =	100 lbs.
B–Belt	250 × 5% =	13 lbs.
C–Rollers	400 × 5% =	20 lbs.
G–Deflector	50 × 30% =	15 lbs.
H–Traffic Cop	250 × 30% =	75 lbs.
		223 lbs.
J–Ends	223 × 15% =	33 lbs.
K–Belt Pull at Headshaft	=	256 lbs.
	This may be called	260 lbs.

EXAMPLE 2

Horizontal and Inclined Belt Conveyor with Slider Bed and Roller Return

Assume Conveyor to handle Live Load of 1000 pounds with claw-top rubber impregnated Belt weighing 200 pounds on steel slider bed. Ball bearing return Rolls weigh 50 pounds. Live load on 25° incline only, 750 pounds. Include one three pulley bend near receiving end. Conveyor is non-reversible.

A–Live Load	1000 × 30% =	300 lbs.
B–Top Belt	100 × 30% =	30 lbs.
Bottom Belt	100 × 5% =	5 lbs.
C–Rollers	50 × 5% =	3 lbs.
E–Incline	750 × .42 =	315 lbs.
		653 lbs.
F–Bend	653 × 3% =	20 lbs.
		673 lbs.
J–Ends	673 × 15% =	101 lbs.
K–Belt Pull at Headshaft	=	774 lbs.
	This may be called	780 lbs.

L – HORSE POWER AT HEADSHAFT

To find the required horsepower at headshaft multiply belt pull at headshaft (Par. K) by the speed in feet per minute and divide by 33,000. This formula is expressed in table on Page 181.

$$\text{Horsepower at Headshaft} = \frac{\text{Belt Pull} \times \text{Speed in F.P.M.}}{33{,}000}$$

M – HORSE POWER FOR DRIVE UNIT

The additional horsepower required to overcome frictional losses in drive unit is figured as a percentage of horsepower at headshaft. This percentage varies with the type of drive as shown below.

Horsepower for Drive Unit = Horsepower at Headshaft × Total Drive %

	Drive %
For each Belt Drive add	5%
For each Chain Drive add	7½%
For each Gear Drive add	7½%
For Variable Speed Unit add	15%
For Single Reduction Planetary Reducer add	3%
For Double Reduction Planetary Reducer add	5%
For Single Reduction Herringbone Reducer add	3%
For Double Reduction Herringbone Reducer add	5%
For Triple Reduction Herringbone Reducer add	8%
For Worm Gear Reducers add a percentage equal to ½ the ratio of each Worm. (A 250 to 1 reducer having two worms one 25 to 1 and one 10 to 1 would require a percentage addition of $\frac{25}{2} + \frac{10}{2}$ or 17½%)	
For a Helix Attachment on a Reducer add	5%

N – MOTOR HORSE POWER

Take horsepower at headshaft plus horsepower for drive unit and add 25% for contingencies under normal conditions. Then select the next larger standard size motor. If a Gearmotor is used compare the horsepower required with the rated horsepower output.

Motor Horsepower = (L + M) × 1.25

P – TYPICAL HORSE POWER CALCULATIONS

EXAMPLE 1–Cont'd

Belt Pull at Headshaft (K) . . . . . 260 lbs.

Assume a Chain Drive and Single Reduction Worm Gear Reducer 26:1 ratio. Speed 60 F.P.M.

L–Headshaft Horsepower . . . 260 × 60 ÷ 33,000 = .473

M–Horsepower for Drive Unit
(7½% + 13%) × .473 = .097

.570

N–Motor Horsepower . . . . (.473 + .097) × 1.25 = .713

Use ¾ H.P. Motor which is next larger standard size.

EXAMPLE 2–Cont'd

Belt Pull at Headshaft (K) . . . . . 780 lbs.

Assume a Chain Drive and Gearmotor. Speed 50 F.P.M.

L–Headshaft Horsepower . . 780 × 50 ÷ 33,000 = 1.182

M–Horsepower for Drive Unit . . 7½% × 1.182 = .089

1.271

N–Motor Horsepower . . (1.182 + .089) × 1.25 = 1.59

Use Gearmotor with rated output of 1.59 H.P. or over.

HORSE POWER AT HEADSHAFT																		
Speed of Conveyor in Feet Per Minute																		
Pull in Pounds	5	10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	120
10	.002	.003	.005	.006	.008	.009	.011	.012	.014	.015	.017	.018	.021	.024	.027	.030	.033	.036
20	.003	.006	.009	.012	.015	.018	.021	.024	.027	.030	.033	.036	.042	.048	.055	.061	.067	.073
30	.005	.009	.014	.018	.023	.027	.032	.036	.041	.045	.050	.055	.064	.073	.082	.091	.100	.109
40	.006	.012	.018	.024	.030	.036	.042	.048	.055	.061	.067	.073	.085	.097	.109	.121	.133	.145
50	.008	.015	.023	.030	.038	.045	.053	.061	.068	.076	.083	.091	.106	.121	.136	.152	.167	.182
60	.009	.018	.027	.036	.045	.055	.064	.073	.082	.091	.100	.109	.127	.145	.164	.182	.200	.218
70	.011	.021	.032	.042	.053	.064	.074	.085	.095	.106	.117	.127	.148	.170	.191	.212	.233	.255
80	.012	.024	.036	.048	.061	.073	.085	.097	.109	.121	.133	.145	.170	.194	.218	.242	.267	.291
90	.014	.027	.041	.055	.068	.082	.095	.109	.123	.136	.150	.164	.191	.218	.245	.273	.300	.327
100	.015	.030	.045	.061	.076	.091	.106	.121	.136	.152	.167	182	.212	.242	.273	.303	.333	.364
200	.030	.061	.091	.121	.152	.182	.212	.242	.273	.303	.333	.364	.424	.485	.545	.606	.667	.727
300	.045	.091	.136	.182	.227	.273	.318	.364	.409	.455	.500	.545	.636	.727	.818	.909	1.00	1.09
400	.061	.121	.182	.242	.303	.364	.424	.485	.545	.606	.667	.727	.848	.970	1.09	1.21	1.33	1.45
500	.076	.152	.227	.303	.379	.455	.530	.606	.682	.758	.833	.909	1.06	1.21	1.36	1.52	1.67	1.82
600	.091	.182	.273	.364	.455	.545	.636	.727	.818	.909	1.00	1.09	1.27	1.45	1.64	1.82	2.00	2.18
700	.106	.212	.318	.424	.530	.636	.742	.848	.954	1.06	1.17	1.27	1.48	1.70	1.91	2.12	2.33	2.55
800	.121	.242	.364	.485	.606	.727	.848	.970	1.09	1.21	1.33	1.45	1.70	1.94	2.18	2.42	2.67	2.91
900	.136	.273	.409	.545	.682	.818	.954	1.09	1.23	1.36	1.50	1.64	1.91	2.18	2.45	2.73	3.00	3.27
1000	.152	.303	.455	.606	.758	.909	1.06	1.21	1.36	1.52	1.67	1.82	2.12	2.42	2.73	3.03	3.33	3.64

HORSE POWER TABLE

For convenience in finding the required Horsepower at Headshaft the above table may be used. This table expresses the formula,

$$\text{Horsepower at Headshaft} = \frac{\text{Pull at Headshaft} \times \text{Speed in F.P.M.}}{33{,}000}$$

Example 1–Belt Conveyor

See page 180, Par. P, Example 1. Belt Pull (K) at headshaft is 260 pounds. Speed of conveyor 60 F.P.M. From above table:

H.P. at 60 F.P.M. for 200 lbs. pull = .364
H.P. at 60 F.P.M. for 60 lbs. pull = .109
H.P. at 60 F.P.M. for 260 lbs. pull = .473

Example 2–Slat Conveyor

See page 191, Par. L, Example 2. Chain Pull (G) at headshaft is 560 pounds. Speed of conveyor 10 F.P.M. From above table:

H.P. at 10 F.P.M. for 500 lbs. pull = .152
H.P. at 10 F.P.M. for 60 lbs. pull = .018
H.P. at 10 F.P.M. for 560 lbs. pull = .170

LIVE ROLLER CONVEYOR
HORSE POWER FORMULA

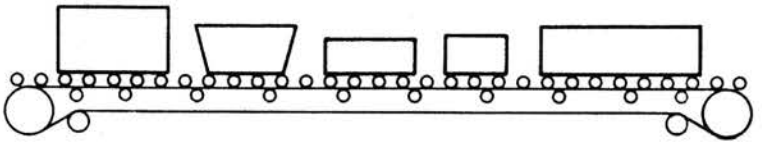
When computing the horsepower required for driving a Live Roller Conveyor, it is necessary first to determine the total belt pull. This is based upon the live load and the weight of all moving parts multiplied by the coefficient of friction.

The following paragraphs outline the procedure for figuring the belt pull for each of the above items and list the percentage additions for special features and drive unit. Follow typical examples in arriving at total horsepower of motor.

A – LIVE LOAD, BELT, ROLLERS

Figure the maximum total weight of material handled on conveyor plus weight of belting plus weight of all rollers.

Belt Pull = (Live Load + Weight Rollers + Weight Belting) × C. of F.



For weights of Rollers see Page 176

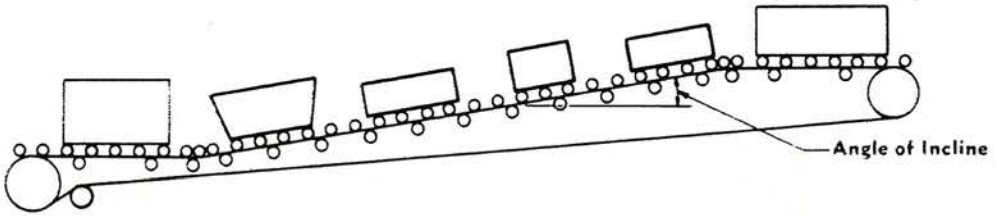
	C. of F.
Ball Bearing Rollers	7½%
Bronze Bearing Rollers	15%

WEIGHT OF BELTING (Rubber Transmission)	
Size	Weight
28 Oz. Duck 3 Ply	.8 lbs. / sq. ft.
28 Oz. Duck 4 Ply	1.0 lbs. / sq. ft.
32 Oz. Duck 4 Ply	1.1 lbs. / sq. ft.

B – INCLINES

When all or part of conveyor is inclined additional belt pull is required. Follow the preceding steps and in addition add the weight of material on incline multiplied by the sine of angle of incline from table shown on page 177. Add for declines the same as for inclines.

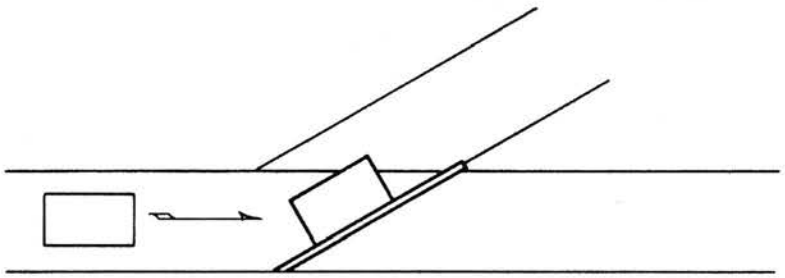
Belt Pull = Live Load on Incline × Sine of Angle of Incline



C – DEFLECTORS

Belt pull required for each Deflector equals 30% of weight of heaviest package.

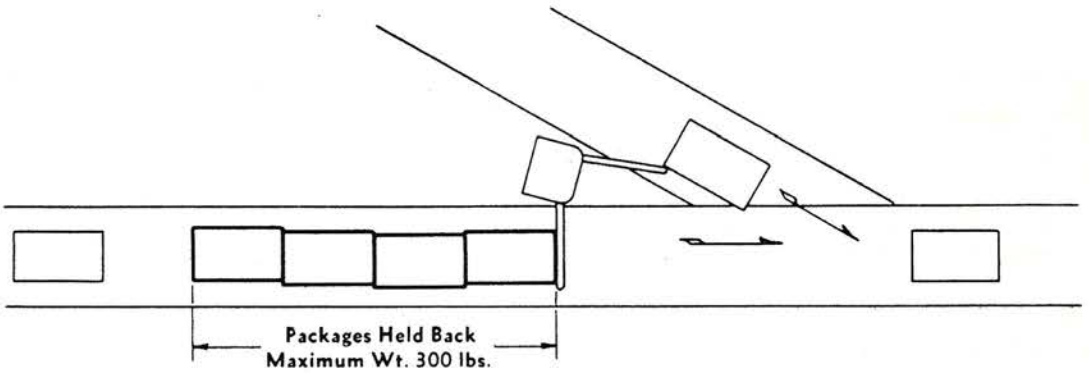
Belt Pull = Weight of Heaviest Package × 30%



D – TRAFFIC COPS

Belt pull required for each Traffic Cop equals 15% of weight of maximum number of packages held back.

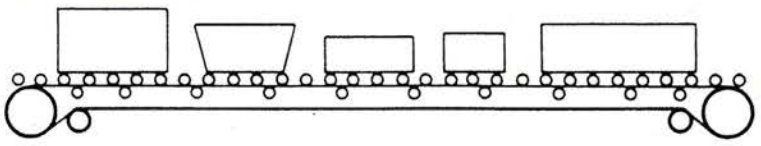
Belt Pull = Total Weight of Packages Held Back × 15%



E – ENDS

Belt Pull required for head and tail pulleys is calculated by multiplying the sum of items A, B, C, and D by 15%

Belt Pull = (A + B + C + D) × 15%



F – BELT PULL AT HEADSHAFT

This is the sum of the belt pull for all preceding items.

EXAMPLE 1

Horizontal Live Roller Conveyor

Assume Conveyor to handle Live Load of 2000 pounds, weight of Belting 100 pounds, weight of ball bearing Rollers 1500 pounds. Included are one Deflector and one Traffic Cop to hold back a maximum of 4 packages weighing 30 pounds each.

A–Live Load	2000 lbs.		
Belting	100 lbs.		
Rollers	1500 lbs.		
	3600 lbs.	× 7½% =	270 lbs.
C–Deflector	30	× 30% =	9 lbs.
D–Traffic Cop	120	× 25% =	30 lbs.
			309 lbs.
E–Ends	309	× 15% =	46 lbs.
F–Belt Pull at Headshaft		=	355 lbs.
		This may be called	360 lbs.

EXAMPLE 2

Horizontal and Inclined Live Roller Conveyor

Assume Conveyor to handle Live Load of 1500 pounds, weight of Belting 100 pounds, weight of ball bearing Rollers 1000 pounds. Live Load on 5° Incline 750 pounds.

A–Live Load	1500 lbs.		
Belting	100 lbs.		
Rollers	1000 lbs.		
	2600 lbs.	× 7½% =	195 lbs.
B–Incline	750	× .09 =	68 lbs.
			263 lbs.
E–Ends	263	× 15% =	39 lbs.
F–Belt Pull at Headshaft		=	302 lbs.
		This may be called	310 lbs.

G – HORSE POWER AT HEADSHAFT

To find the required horsepower at headshaft multiply belt pull at headshaft (Par. F) by the speed in feet per minute and divide by 33,000. This formula is expressed in table on Page 181.

$$\textbf{Horsepower at Headshaft} = \frac{\textbf{Belt Pull} \times \textbf{Speed in F.P.M.}}{33{,}000}$$

H – HORSE POWER FOR DRIVE UNIT

The additional horsepower required to overcome frictional losses in drive unit is figured as a percentage of horsepower at headshaft. This percentage varies with the type of drive as given on Page 180.

Horsepower for Drive Unit = Horsepower at Headshaft × Total Drive %

J – MOTOR HORSE POWER

Take horsepower at headshaft plus horsepower for drive unit and add 25% for contingencies under normal conditions. Then select the next larger standard size motor. If a Gearmotor is used compare the horsepower required with the rated horsepower output.

Motor Horsepower = (G + H) × 1.25

K – TYPICAL HORSE POWER CALCULATIONS

EXAMPLE 1–Cont'd

Belt Pull at Headshaft (F) ..... 360 lbs.

Assume a Chain Drive and a Double Reduction Planetary Reducer. Speed of conveyor 40 F.P.M.

G–Horsepower at Headshaft

$360 \times 40 \div 33{,}000 = .436$

H–Horsepower for Drive Unit

$.436 \times 7\frac{1}{2}\% + 5\% = .055$

$.491$

J–Motor Horsepower ..... $.491 \times 1.25 = .614$

Use ¾ H.P. Motor which is next larger standard size.

EXAMPLE 2–Cont'd

Belt Pull at Headshaft (F) ..... 310 lbs.

Assume a Chain Drive and a Gear-Motor. Speed of conveyor 80 F.P.M.

G–Horsepower at Headshaft

$310 \times 80 \div 33{,}000 = .752$

H–Horsepower for Drive Unit

$.752 \times 7\frac{1}{2}\% = .056$

$.808$

J–Motor Horsepower ..... $.808 \times 1.25 = 1.01$

Use Gear-Motor with rated output of 1.01 H.P. or over.

THE BELT

To determine the size of a belt it is necessary to find the maximum belt tension. This is based on the Belt Pull required to operate the conveyor, known as the Effective Tension, plus an added tension necessary to maintain driving contact between belt and pulley.

A – BELT TENSION

The effective tension is usually designated "E", the maximum tension "T_1", and the minimum or added tension necessary for driving conveyor, "T_2".

To find T_1 or T_2 first determine the number of degrees the belt wraps around the drive pulley. Then from the table below select the proper factor and multiply this by the effective tension E.

T_1 = Factor F × E

T_2 = Factor f × E

$E = T_1 - T_2$

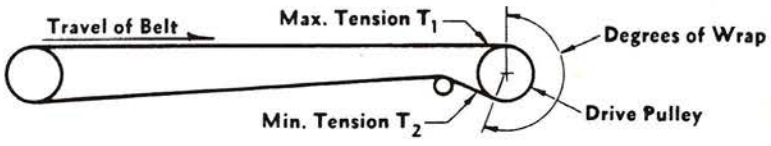


TABLE OF FACTORS

Degrees of Wrap	Bare Pulley		Lagged Pulley		Degrees of Wrap	Bare Pulley		Lagged Pulley	
	Factor F for finding T_1	Factor f for finding T_2	Factor F for finding T_1	Factor f for finding T_2		Factor F for finding T_1	Factor f for finding T_2	Factor F for finding T_1	Factor f for finding T_2
180	1.84	.84	1.50	.50	215	1.64	.64	1.37	.37
185	1.81	.81	1.48	.48	220	1.62	.62	1.35	.35
190	1.78	.78	1.46	.46	225	1.60	.60	1.34	.34
195	1.75	.75	1.44	.44	230	1.58	.58	1.32	.32
200	1.72	.72	1.42	.42	240	1.54	.54	1.30	.30
205	1.69	.69	1.40	.40	250	1.50	.50	1.28	.28
210	1.67	.67	1.38	.38	260	1.47	.47	1.26	.26

B – BELT SIZE

To find the belt size the width of the belt or the number of plies must be assumed. See table below for the working stress of belting.

$$\text{Belt Width} = \frac{\text{Max. Tension } T_1}{\text{Working Stress of Belting} \times \text{No. of Belt Plies}}$$

$$\text{No. of Belt Plies} = \frac{\text{Max. Tension } T_1}{\text{Working Stress of Belting} \times \text{Width of Belting (in inches)}}$$

WORKING STRESSES OF BELTING					
Canvas Stitched		Rubber Covered		Rubber Transmission	
Duck Wt.	Working Stress Per Inch Ply	Duck Wt.	Working Stress Per Inch Ply	Duck Wt.	Working Stress Per Inch Ply
32 Oz.	25 lbs.	28 Oz.	25 lbs.	28 Oz.	25 lbs.
37½ Oz. Std.	30 lbs.	32 Oz.	30 lbs.	32 Oz.	30 lbs.
37½ Oz. H. Duty	40 lbs.			33 Oz.	35 lbs.

C – BELT SIZE CALCULATION

On Page 184, Par. F, Example 1, the Belt Pull was found to be 360 pounds. Assume a 200 degree belt wrap on the lagged drive pulley. Rubber Transmission Belt to be 4 ply 28 oz.

A–Belt Tension T_1 . . . $1.42 \times 360 = 511$ lbs.

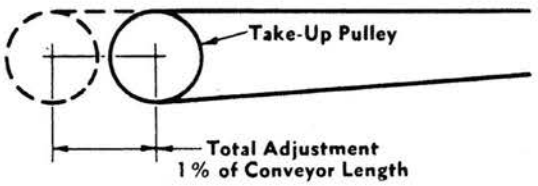
B–Belt Size. $511 \div 25 \times 4 = 5.11$ inches wide

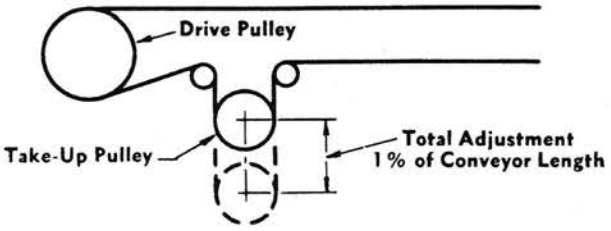
A 6 inch wide 4 ply 28 oz. belt should be used.

TAKE-UPS

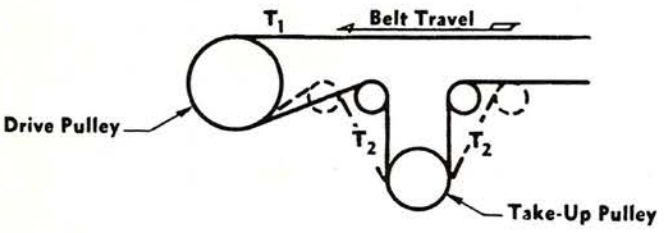
The minimum total take-up adjustment should be equal to 1 % of the length of the conveyor. A conveyor 50 feet long should have 6 inches of take-up adjustment.

To calculate the amount of weight required for an automatic counterweighted take-up the maximum or minimum belt tension (T_1 or T_2) must be found as previously explained. Page 185, Par. A.



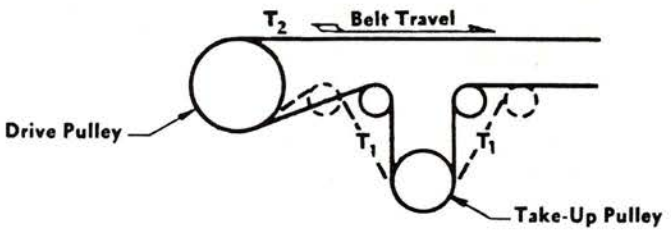


A – TAKE-UP WEIGHT



For a non-reversing conveyor with belt traveling in direction shown the total take-up weight should be twice the minimum tension T_2 multiplied by the factor for the angle of wrap on the take-up pulley.

Take-up weight = 2 × T_2 × Factor



For a non-reversing conveyor with belt traveling in direction shown or for a reversible conveyor the total take-up weight should be twice the maximum tension T_1 multiplied by the factor for the angle of wrap on the take-up pulley.

Take-up weight = 2 × T_1 × Factor

ANGLE OF WRAP FACTORS									
Angle of Wrap	180	160	140	120	100	80	60	40	20
Factor	1.	.98	.94	.87	.77	.64	.50	.34	.17

B – TAKE-UP WEIGHT CALCULATION

On Page 186, Par. C, the maximum belt tension T_1 was found to be 511 pounds. Assume a reversing conveyor with a counterweighted take-up pulley having 160 degrees of wrap.

Take-up Weight = 2 × 511 × .98 = 1002 lbs.

This weight includes pulley, shaft and bearings as well as counterweights.

SLAT CONVEYOR
HORSE POWER FORMULA

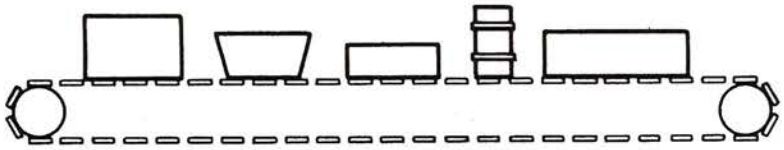
When computing the horsepower required for driving an Apron Conveyor, it is necessary first to determine the total chain pull. This is based upon the live load and the weight of all moving parts multiplied by the coefficient of friction which varies with the size and type of chain.

The following paragraphs outline the procedure for figuring the chain pull for each of the above items and lists the percentage additions for special features and drive unit. Follow typical examples in arriving at total horsepower of motor.

A – LIVE LOAD

This is the weight of material handled on conveyor and should be figured for total length of conveyor under maximum loading conditions.

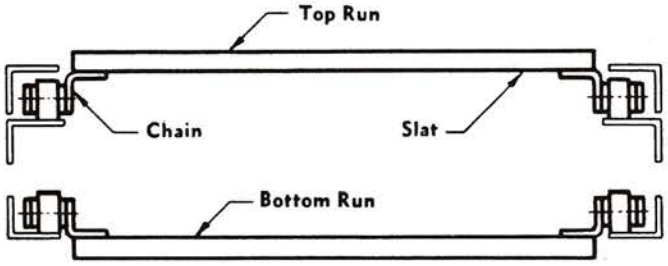
Chain Pull = Total Live Load × C. of F. for Chain



B – WEIGHT OF CHAIN AND SLATS

Include weight of both top and bottom runs of apron. See tables below.

Chain Pull = Total Weight of Chain and Slats × C. of F. for Chain



WEIGHTS OF CHAIN	
Chain Size	Wt. per Ft. per Strand
9½ Plain	3.4 lbs.
9½ with Attachments	4.1 lbs.
954 Plain	3.3 lbs.
954 with Attachments	4.0 lbs.
2194 Plain	6.8 lbs.
2194 with Attachments	8.1 lbs.
2196 Plain	5.3 lbs.
2196 with Attachments	6.8 lbs.
2130 Plain	9.5 lbs.
2130 with Attachments	12.5 lbs.

WEIGHT PER SLAT in pounds per foot			
2½ x ⅞ Hardwood	.759	2½ x 2 x ¼ Angle	3.62
2½ x 1⅛ Hardwood	.975	2½ x 2½ x ¼ Angle	4.1
3½ x ⅞ Hardwood	1.06	2½ x 3½ x ¼ Angle	4.9
3½ x 1⅛ Hardwood	1.13	3½ x 3½ x ⅜ Angle	8.5
5½ x 1⅛ Hardwood	2.14	3" Structural Channel	4.1
5½ x 1⅜ Hardwood	2.62	4" Structural Channel	5.4
2½ x ¼ Steel Flat	2.13	5" Structural Channel	6.7
2½ x ⅜ Steel Flat	3.19	2½" x 1" x 10 Ga. Channel	2.77
3½ x ⅜ Steel Flat	4.46	3½" x 1¼" x 3/16 Channel	3.83
2½ x 1½ x 3/16 Angle	2.44	5½" x 1½" x ¼ Channel	7.23

C – COEFFICIENT OF FRICTION

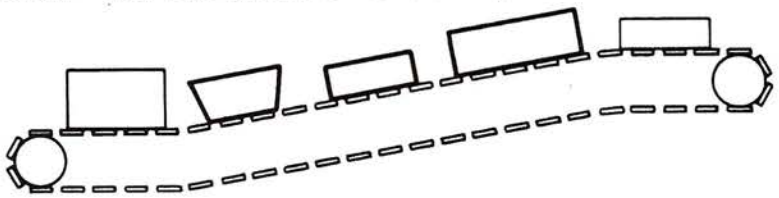
The coefficient of friction varies with the size and type of chain. Select the proper coefficient from the table below.

Chain	No. 9½	No. 954	No. 2194	No. 2196	No. 2130
C. of F.	17.5%	17.5%	15%	15%	12.5%

D – INCLINES

When all or part of conveyor is inclined additional chain pull is required. Follow the preceding steps and in addition add the weight of material on incline multiplied by the sine of the angle of incline from table on Page 177. Add for declines the same as for inclines.

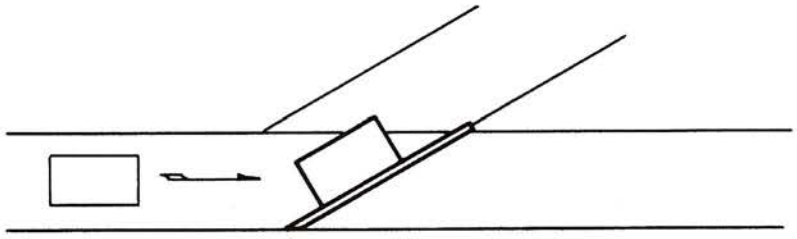
Chain Pull = Live Load on Incline × Sine of Angle of Incline



E – DEFLECTORS

Chain Pull required for each deflector equals weight of heaviest package multiplied by coefficient of friction of 40%.

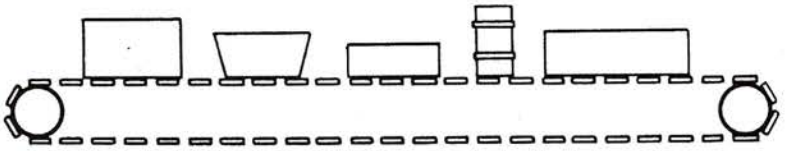
Chain Pull = Weight of Heaviest Package × 40%



F – ENDS

Chain Pull required for head and tail sprockets is calculated by multiplying the sum of items A, B, D, and E by 10%. Omit items not applicable.

Chain Pull = (A + B + D + E) × 10%



G – CHAIN PULL AT HEADSHAFT

This is the sum of the chain pull for all preceding items

EXAMPLE 1

Horizontal Slat Conveyor

Assume conveyor to handle Live Load of 2000 pounds on No. 954 chain and slats weighing 500 pounds. Include one Deflector deflecting 50 pound packages from steel slats.

A–Live Load	2000 × 17.5% =	350 lbs.
B–Chain and Slats	500 × 17.5% =	88 lbs.
E–Deflector	50 × 40% =	20 lbs.
		458 lbs.
F–Ends	458 × 10% =	46 lbs.
G–Chain Pull at Headshaft	=	504 lbs.

This may be called 510 lbs.

EXAMPLE 2

Horizontal and Inclined Slat Conveyor

Assume conveyor to handle Live Load of 1500 pounds on No. 2196 chain and slats weighing 1000 pounds Live Load on 9° Incline only 800 pounds.

A–Live Load	1500 × 15% =	225 lbs.
B–Chain and Slats	1000 × 15% =	150 lbs.
D–Incline	800 × 16% =	128 lbs.
		503 lbs.
F–Ends	503 × 10% =	50 lbs.
G–Chain Pull at Headshaft	=	553 lbs.

This may be called 560 lbs.

H – HORSE POWER AT HEADSHAFT

To find the required horsepower at the headshaft multiply chain pull at headshaft (Par. G) by the speed in feet per minute and divide by 33,000. This formula is expressed in the table on Page 181.

$$\textbf{Horsepower at Headshaft} = \frac{\textbf{Chain Pull} \times \textbf{Speed in F.P.M.}}{\textbf{33,000}}$$

J – HORSE POWER FOR DRIVE UNIT

The additional horsepower required to overcome frictional losses in drive unit is figured as a percentage of horsepower at headshaft. This percentage varies with the type of drive as given on Page 180.

Horsepower for Drive Unit = Horsepower at Headshaft × Total Drive %

K – MOTOR HORSE POWER

Take horsepower at headshaft plus horsepower for drive unit and add 25% for contingencies under normal conditions. Then select the next larger standard size motor. If a Gearmotor is used compare the horsepower required with the rated horsepower output.

Motor Horsepower = (H + J) × 1.25

L – TYPICAL HORSE POWER CALCULATION

EXAMPLE 1–Cont'd

Chain Pull at Headshaft (G) . . . . . 510 lbs.

Assume a Chain Drive and a Gearmotor. Speed 50 F.P.M.

H–Horsepower at Headshaft

$$510 \times 50 \div 33{,}000 = .773$$

J–Horsepower for Drive Unit

$$.773 \times 7\frac{1}{2}\% = .058$$

$$.831$$

K–Motor Horsepower . . . . . $(.773 + .058)\ 1.25 = 1.039$

Use Gearmotor with rated output of 1.04 H.P. or over.

EXAMPLE 2–Cont'd

Chain Pull at Headshaft (G) . . . . . 560 lbs.

Assume a Gear Drive and a Triple Reduction Herringbone Reducer. Speed 10 F.P.M.

H–Horsepower at Headshaft

$$560 \times 10 \div 33{,}000 = .170$$

J–Horsepower for Drive Unit

$$.170 \times (7\frac{1}{2}\% + 8\%) = .026$$

$$.196$$

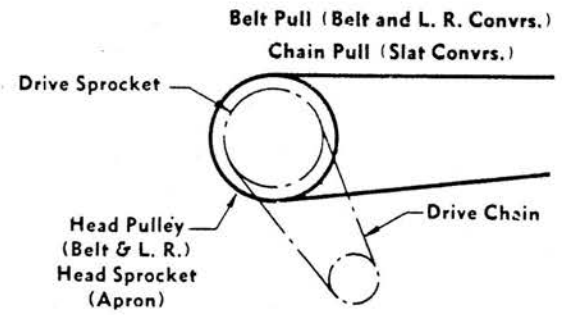
K–Motor Horsepower . . . . . $(.170 + .026)\ 1.25 = .245$

Use 1/4 H.P. Motor which is next larger standard size.

DRIVE CHAIN SIZE

To find the size of drive chain to use, the belt pull for Belt and Live Roller Conveyors or chain pull for Slat Conveyors must be calculated as explained in previous paragraphs. From this the Drive Chain Pull is found. From table below select chain size with working stress equal to or greater than drive chain pull.

$$\textbf{Drive Chain Pull} = \frac{\textbf{Belt (or Chain) Pull} \times \textbf{Radius Head Pulley (or Sprocket)}}{\textbf{Pitch Radius Drive Sprocket}} \times 1.075$$



WORKING STRESSES OF CHAIN IN POUNDS							
Drive Chain Speed	# 40	# 50	# 60	# 80	# 100	# 120	#140
0-50 F. P. M.	530	870	1200	2000	3400	4850	6600
50-100 F. P. M.	460	760	1050	1750	3000	4250	5750

EXAMPLE 1

Assume a belt pull of 750 pounds, radius of head pulley 5 inches, and pitch radius of drive sprocket 5.5 inches. Speed of drive chain 55 F.P.M.

Drive Chain Pull $= \frac{750 \times 5}{5.5} \times 1.075$ or 733 lbs.

Use No. 50 chain which has a working stress of 760 pounds at 55 F. P. M.

EXAMPLE 2

Assume a chain pull of 1000 pounds, radius of head sprocket 7.75 inches, and pitch radius of drive sprocket 7 inches. Speed of drive chain 30 F.P.M.

Drive Chain Pull $= \frac{1000 \times 7.75}{7} \times 1.075$ or 1190 lbs.

Use No. 60 chain which has a working stress of 1200 pounds at 30 F. P. M.

CHAIN DRIVE RATIOS

Driver Spkt. No. T	Driven Sprocket — No Teeth						
	26	30	35	40	45	50	60
15	1.73	2.00	2.33	2.67	3.00	3.33	4.00
16	1.63	1.88	2.19	2.50	2.81	3.13	3.75
17	1.53	1.76	2.06	2.35	2.65	2.94	3.53
18	1.44	1.67	1.94	2.22	2.50	2.78	3.33
19	1.37	1.58	1.84	2.11	2.37	2.63	3.16

PITCH DIAMETER OF STANDARD DRIVE SPROCKETS

Chain Size	Number of Teeth											
	15	16	17	18	19	26	30	35	40	45	50	60
# 30	1.804	1.922	2.041	2.159	2.278	3.111	3.588	4.183	4.780	5.376	5.972	7.165
# 40	2.405	2.563	2.721	2.879	3.038	4.148	4.783	5.578	6.373	7.168	7.963	9.554
# 50	3.006	3.204	3.401	3.599	3.797	5.185	5.979	6.972	7.966	8.960	9.954	11.942
# 60	3.607	3.844	4.082	4.319	4.557	6.222	7.175	8.367	9.559	10.752	11.945	14.331
# 80	4.810	5.126	5.442	5.759	6.076	8.296	9.567	11.156	12.746	14.336	15.926	19.107
# 100	6.012	6.407	6.803	7.198	7.595	10.370	11.958	13.945	15.932	17.920	19.908	23.884
# 120	7.215	7.689	8.163	8.638	9.113	12.444	14.350	16.734	19.118	21.503	23.889	28.661

GEARMOTOR OUTPUT R.P.M.

Pulley Diameter	Sprocket Ratio	Speed F.P.M.																	
		5	10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	120
8	2 to 1	4.8	9.5	14.3	19.1	23.9	28.6	33.4	38.2	43.0	47.7	52.5	57.3	66.8	76.4	85.9	95.5	105	115
	3 to 1	7.2	14.3	21.5	28.6	35.8	43.0	50.1	57.3	64.4	71.6	78.7	85.9	100	115	129	143	158	172
	4 to 1	9.5	19.1	28.6	38.2	47.7	57.3	66.8	76.4	85.9	95.5	105	115	134	153	172	191	210	229
10	2 to 1	3.8	7.6	11.5	15.3	19.1	22.9	26.7	30.5	34.4	38.2	42.0	45.8	53.5	61.1	68.7	76.4	84.0	91.6
	3 to 1	5.7	11.5	17.2	22.9	28.6	34.4	40.1	45.8	51.5	57.3	63.0	68.7	80.2	91.6	103	115	126	138
	4 to 1	7.6	15.3	22.9	30.5	38.2	45.8	53.5	61.1	68.7	76.4	84.0	91.6	107	122	138	153	168	183
12	2 to 1	3.2	6.4	9.5	12.7	15.9	19.1	22.3	25.5	28.6	31.8	35.0	38.2	44.5	50.9	57.3	63.6	70.0	76.4
	3 to 1	4.8	9.5	14.3	19.1	23.9	28.6	33.4	38.2	43.0	47.7	52.5	57.3	66.8	76.4	85.9	95.5	105	115
	4 to 1	6.4	12.7	19.1	25.5	31.8	38.2	44.5	50.9	57.3	63.6	70.0	76.4	89.1	102	115	127	140	153
14	2 to 1	2.7	5.5	8.2	10.9	13.6	16.4	19.1	21.8	24.5	27.3	30.0	32.7	38.2	43.6	49.1	54.5	60.0	65.5
	3 to 1	4.1	8.2	12.3	16.4	20.5	24.5	28.6	32.7	36.8	40.9	45.0	49.1	57.3	65.5	73.6	81.8	90.0	98.2
	4 to 1	5.5	10.9	16.4	21.8	27.3	32.7	38.2	43.6	49.1	54.5	60.0	65.5	76.4	87.3	98.2	109	120	131
16	2 to 1	2.4	4.8	7.2	9.5	11.9	14.3	16.7	19.1	21.5	23.9	26.2	28.6	33.4	38.2	43.0	47.7	52.5	57.3
	3 to 1	3.6	7.2	10.7	14.3	17.9	21.5	25.1	28.6	32.2	35.8	39.4	43.0	50.1	57.3	64.4	71.6	78.7	95.9
	4 to 1	4.8	9.5	14.3	19.1	23.9	28.6	33.4	38.2	43.0	47.7	52.5	57.3	66.8	76.4	85.9	95.5	105	115

The above chart expresses the formula, Gearmotor R.P.M. = Speed (F.P.M.) × Sprocket Ratio × $\frac{12}{\text{Pulley Dia}}$ × $\frac{7}{22}$

To find the Gearmotor R.P.M. from the chart select pulley size and sprocket ratio. Where they intersect the speed, the R.P.M. will be found. If a Gearmotor with this exact ratio is not available choose one nearest and vary the sprocket ratio accordingly.

Example–Using a 10 inch diameter pulley, 3 to 1 sprocket ratio and a speed of 80 F.P.M. a Gearmotor with 91.6 R.P M. would be required.

CHART 1–REDUCER RATIOS USING 1200 R.P.M. MOTOR

Pulley Diameter	Sprocket Ratio	Speed F.P.M.																	
		5	10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	120
8	2 to 1	251	126	83.8	62.9	50.3	41.9	35.9	31.4	27.9	25.1	22.9	21.0	18.0	15.7	14.0	12.6	11.4	10.5
	3 to 1	168	83.8	55.9	41.9	33.5	27.9	23.9	21.0	18.6	16.8	15.2	14.0	12.0	10.5	9.3	8.4	7.6	7.0
	4 to 1	126	62.9	41.9	31.4	25.1	21.0	18.0	15.7	14.0	12.6	11.4	10.5	9.0	7.9	7.0	6.3	5.7	5.2
10	2 to 1	314	157	105	78.6	62.9	52.4	44.9	39.3	34.9	31.4	28.6	26.2	22.5	19.6	17.5	15.7	14.3	13.1
	3 to 1	210	105	69.8	52.4	41.9	34.9	29.9	26.2	23.3	21.0	19.0	17.5	15.0	13.1	11.6	10.5	9.5	8.7
	4 to 1	157	78.6	52.4	39.3	31.4	26.2	22.4	19.6	17.5	15.7	14.3	13.1	11.2	9.8	8.7	7.9	7.1	6.5
12	2 to 1	377	189	126	94.3	75.4	62.9	53.9	47.1	41.9	37.7	34.3	31.4	26.9	23.6	21.0	18.9	17.1	15.7
	3 to 1	251	126	83.8	62.9	50.3	41.9	35.9	31.4	27.9	25.1	22.9	21.0	18.0	15.7	14.0	12.6	11.4	10.5
	4 to 1	189	94.3	62.9	47.1	37.7	31.4	26.9	23.6	21.0	18.9	17.1	15.7	13.5	11.8	10.5	9.4	8.6	7.9
14	2 to 1	440	220	147	110	88.0	73.3	62.9	55.0	48.9	44.0	40.0	36.7	31.4	27.5	24.4	22.0	20.0	18.3
	3 to 1	293	147	97.8	73.3	58.7	48.9	41.9	36.7	32.6	29.3	26.7	24.4	21.0	18.3	16.3	14.7	13.3	12.2
	4 to 1	220	110	73.3	55.0	44.0	36.7	31.4	22.5	24.4	22.0	20.0	18.3	15.7	13.8	12.2	11.0	10.0	9.2
16	2 to 1	503	251	168	126	101	83.8	71.8	62.9	55.9	50.3	45.7	41.9	35.9	31.4	27.9	25.1	22.9	21.0
	3 to 1	335	168	112	83.8	67.0	55.9	47.9	41.9	37.2	33.5	30.5	27.9	24.0	21.0	18.6	16.8	15.2	14.0
	4 to 1	251	126	83.8	62.9	50.3	41.9	35.9	31.4	27.9	25.1	22.9	21.0	18.0	15.7	14.0	12.6	11.4	10.5

CHART 2–REDUCER RATIOS USING 1800 R.P.M. MOTOR

Pulley Diameter	Sprocket Ratio	Speed F.P.M.																	
		5	10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	120
8	2 to 1	377	189	126	94.3	75.4	62.9	53.9	47.1	41.9	37.7	34.3	31.4	26.9	23.6	21.0	18.9	17.1	15.7
	3 to 1	251	126	83.8	62.9	50.3	41.9	35.9	31.4	27.9	25.1	22.9	21.0	18.0	15.7	14.0	12.6	11.4	10.5
	4 to 1	189	94.3	62.9	47.1	37.7	31.4	26.9	23.6	21.0	18.9	17.1	15.7	13.5	11.8	10.5	9.4	8.6	7.9
10	2 to 1	471	236	157	118	94.3	18.6	67.3	58.9	52.4	47.1	42.9	39.3	33.7	29.5	26.2	23.6	21.4	19.6
	3 to 1	314	157	105	78.6	62.9	52.4	44.9	39.3	34.9	31.4	28.6	26.2	22.5	19.6	17.5	15.7	14.3	13.1
	4 to 1	236	118	78.6	58.9	47.1	39.3	33.7	29.5	26.2	23.6	21.4	19.6	16.8	14.7	13.1	11.8	10.7	9.8
12	2 to 1	566	283	189	141	113	94.3	80.8	70.7	62.9	56.6	51.4	47.2	40.4	35.4	31.4	28.3	25.7	23.6
	3 to 1	377	189	126	94.3	75.4	62.9	53.9	47.1	41.9	37.7	34.3	31.4	26.9	23.6	21.0	18.9	17.1	15.1
	4 to 1	283	141	94.3	70.7	56.6	47.1	40.4	35.4	31.4	28.3	25.7	23.6	20.2	17.7	15.7	14.1	12.9	11.8
14	2 to 1	660	330	220	165	132	110	94.3	82.5	73.3	66.0	60.0	55.0	47.2	41.3	36.7	33.0	30.0	27.5
	3 to 1	440	220	147	110	88.0	73.3	62.9	55.0	48.9	44.0	40.0	36.7	31.4	27.5	24.4	22.0	20.0	18.3
	4 to 1	330	165	110	82.5	66.0	55.0	47.1	41.3	36.7	33.0	30.0	27.5	23.6	20.6	18.3	16.5	15.0	13.7
16	2 to 1	754	377	251	187	151	126	108	94.5	83.7	75.4	68.6	62.9	53.9	47.1	41.9	37.7	34.3	31.4
	3 to 1	503	251	168	126	101	83.8	71.8	62.9	55.8	50.3	45.7	41.9	35.9	31.4	27.9	25.1	22.9	20.9
	4 to 1	377	189	126	94.3	75.4	62.9	53.9	47.1	41.9	37.7	34.3	31.4	26.9	23.6	21.0	18.9	17.1	15.7

The above charts express the formula, $\text{Reducer Ratio} = \frac{\text{R.P.M. Motor}}{\text{Speed (F.P.M.)}} \div \text{Sprocket Ratio} \times \frac{\text{Pulley Dia.}}{12} \times \frac{22}{7}$.

To find the reducer ratio from the charts select pulley size and sprocket ratio. Where they intersect the speed, the reducer ratio will be found. If a reducer with this exact ratio is not available choose one nearest and vary the sprocket ratio accordingly.

Example–Using a 1200 R.P.M. motor, 10 inch diameter pulley and 3 to 1 sprocket ratio with a speed of 55 F.P.M. a reducer ratio of 19 to one would be required.

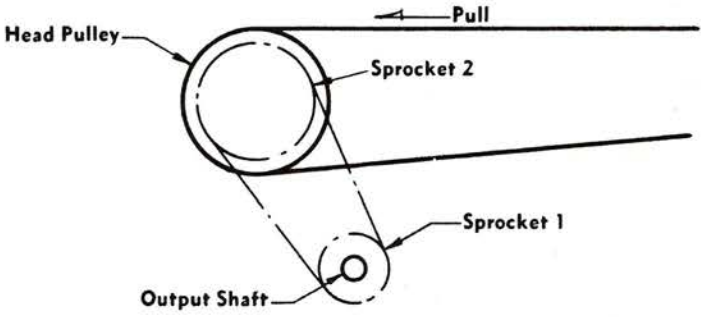
TORQUE AND OVERHUNG LOAD

When selecting a reducer or gearmotor it is necessary to calculate the required torque and overhung load on the output shaft as this must not exceed the manufacturer's rated maximu

The torque and overhung load on the output shaft of reducers and motors may be calculated by using the formula below.

$$\text{Torque} = \frac{\text{Pull} \times \text{Radius Pulley} \times \text{Radius Sprocket 1}}{\text{Radius Sprocket 2}} \times 1.075$$

$$\text{Overhung Load} = \frac{\text{Pull} \times \text{Radius Pulley}}{\text{Radius Sprocket 2}} \times 1.075$$



EXAMPLE

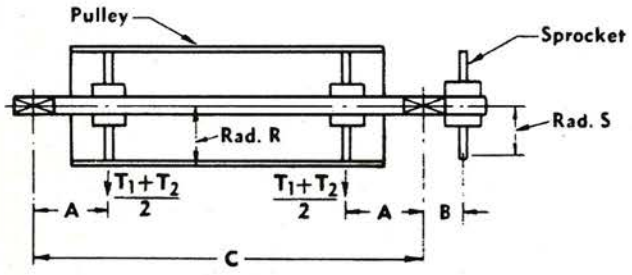
Assume a belt pull of 400 pounds, a 12 inch diameter head pulley, pitch radius of sprocket 1, 2 inches, pitch radius of sprocket 2, 5 inches.

$$\text{Torque} = \frac{400 \times 6 \times 2}{5} \times 1.075 = 1032 \text{ inch pounds}$$

$$\text{Overhung Load} = \frac{400 \times 6}{5} \times 1.075 = 516 \text{ pounds}$$

SHAFT SIZE

To find the required shaft diameter first calculate the torsional moment and bending moments using formula below. Then select the proper service factors "t" and "b" from table. Use chart (Page 195, 196) to locate torsional moment in proper service factor column "t" then extend a horizontal line across chart. Locate the maximum bending moment and extend a line vertically. Curved line above intersection indicates shaft size to use.



Torsional Moment $= (T_1 - T_2) \times R$

Bending Moment due to load on Pulley $= \frac{(T_1 + T_2) \times A}{2}$

Bending Moment due to load on Sprocket $= \frac{(T_1 - T_2) \times R \times B}{S}$

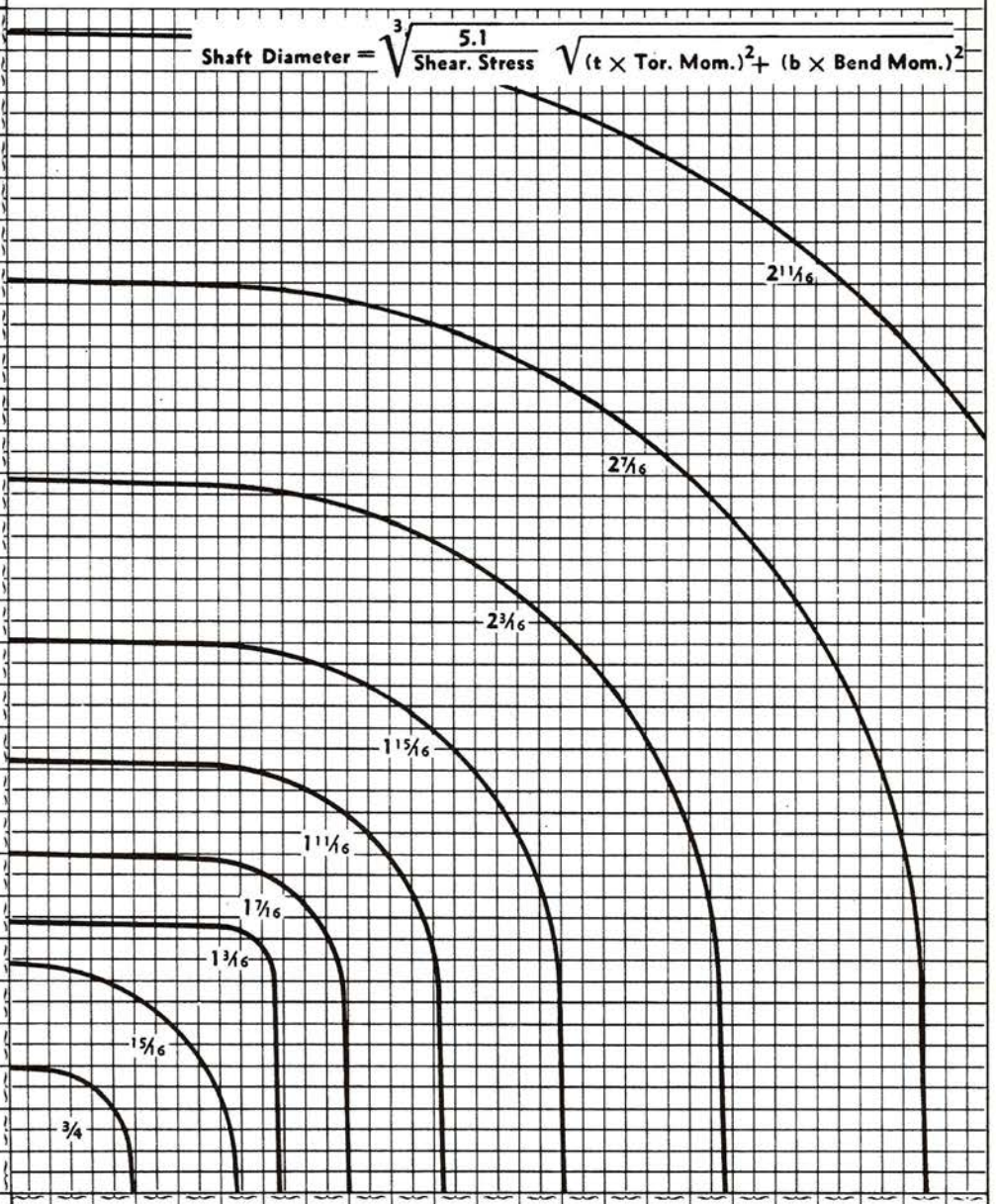
TABLE OF FACTORS		
Operating Conditions	t	b
Light starting and steady running	1.0	1.5
Light starting and uneven running	1.5	1.5
Medium starting and steady or uneven running	2.0	2.0
Light or heavy starting and moderate shock running	2.5	2.5
Light or heavy starting and severe shock running	3.0	3.0

SERVICE FACTOR t				
3	2.5	2	1.5	1
7.7	9.2	11.5	15.3	23
7.3	8.8	11.0	14.7	22
7.0	8.4	10.5	14.0	21
6.7	8.0	10.0	13.3	20
6.3	7.6	9.5	12.7	19
6.0	7.2	9.0	12.0	18
5.7	6.8	8.5	11.3	17
5.3	6.4	8.0	10.7	16
5.0	6.0	7.5	10.0	15
4.7	5.6	7.0	9.3	14
4.3	5.2	6.5	8.7	13
4.0	4.8	6.0	8.0	12
3.7	4.4	5.5	7.3	11
3.3	4.0	5.0	6.7	10
3.0	3.6	4.5	6.0	9
2.7	3.2	4.0	5.3	8
2.3	2.8	3.5	4.7	7
2.0	2.4	3.0	4.0	6
1.7	2.0	2.5	3.3	5
1.3	1.6	2.0	2.7	4
1.0	1.2	1.5	2.0	3
.67	.80	1.0	1.3	2
.33	.40	.50	.67	1
.27	.30	.40	.53	.8
.20	.24	.30	.40	.6
.13	.16	.20	.27	.4
.07	.08	.10	.13	.2
.03	.04	.05	.07	.1

TORSIONAL MOMENT – IN THOUSANDS OF INCH POUNDS

Shaft diameters are based on a safe shearing stress of 6000 pounds per square inch for shafts with keyseats.

$$\text{Shaft Diameter} = \sqrt[3]{\frac{5.1}{\text{Shear. Stress}} \sqrt{(t \times \text{Tor. Mom.})^2 + (b \times \text{Bend Mom.})^2}}$$



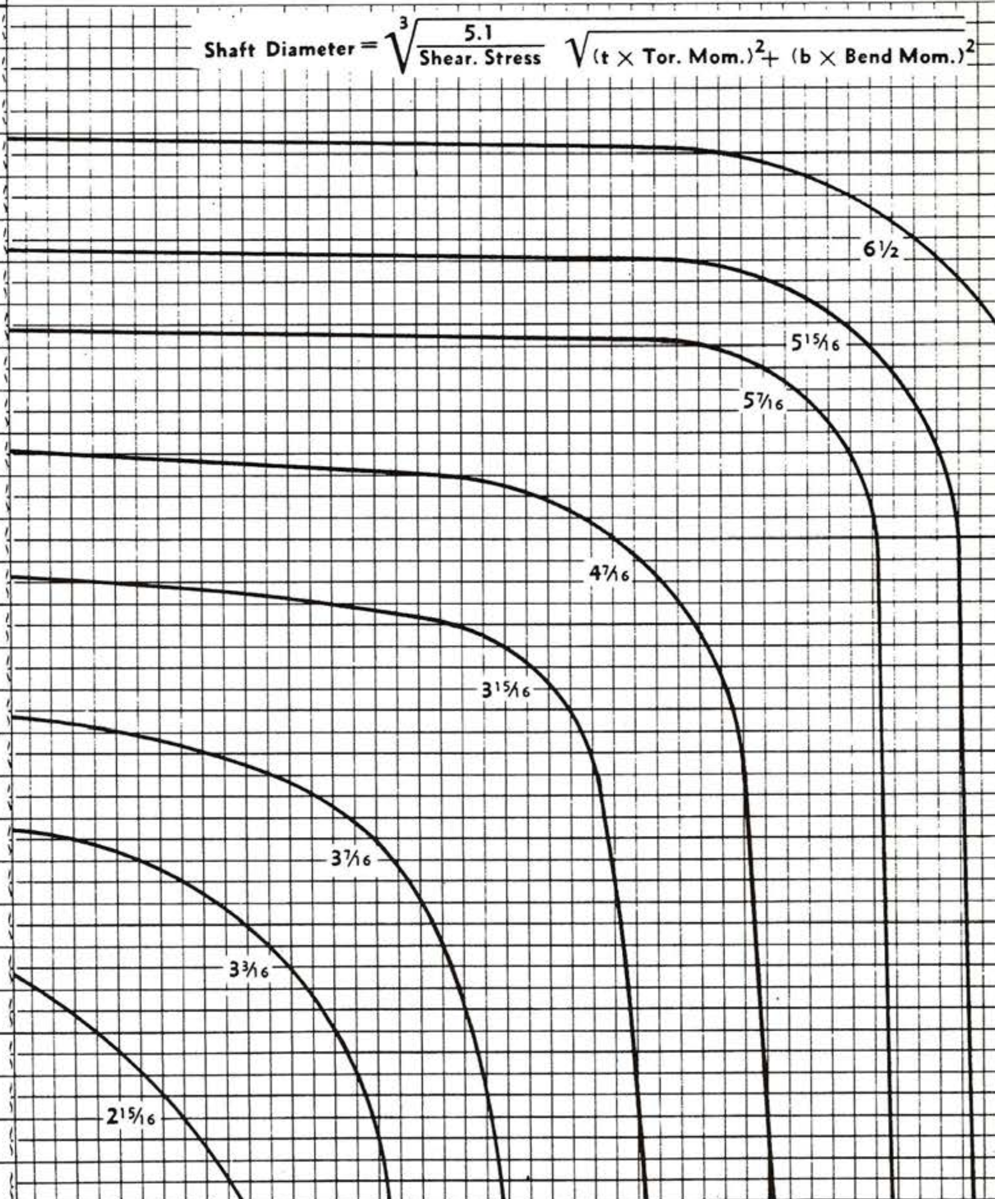
SERVICE FACTOR b																								
3	.03	.07	.13	.20	.27	.33	.67	1.0	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0
2.5	.04	.08	.16	.24	.32	.40	.80	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2
2	.05	.10	.20	.30	.40	.50	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
1.5	.07	.13	.27	.40	.53	.67	1.3	2.0	2.7	3.3	4.0	4.7	5.3	6.0	6.7	7.3	8.0	8.7	9.3	10.0	10.7	11.3	12.0
1	.1	.2	.4	.6	.8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

BENDING MOMENT – IN THOUSANDS OF INCH POUNDS

Shaft diameters are based on a safe shearing stress of 6000 pounds per square inch for shafts with keyseats.

TORSIONAL MOMENT – IN THOUSANDS OF INCH POUNDS

SERVICE FACTOR t				
3	2.5	2	1.5	1
133	160	200	267	400
123	148	185	247	370
113	136	170	227	340
103	124	155	207	310
93.3	112	140	187	280
83.3	100	125	167	250
73.3	88.0	110	147	220
63.3	76.0	95	127	190
53.3	64.0	80	107	160
43.3	52.0	65	86.7	130
33.3	40.0	50	66.7	100
30.0	36.0	45	60.0	90
26.7	32.0	40	53.3	80
23.3	28.0	35	46.7	70
20.0	24.0	30	40.0	60
16.7	20.0	25	33.3	50
15.3	18.4	23	30.7	46
14.0	16.8	21	28.0	42
12.7	15.2	19	25.3	38
11.3	13.6	17	22.7	34
10.0	12.0	15	20.0	30
9.3	11.2	14	18.7	28
8.7	10.4	13	17.3	26
8.0	9.6	12	16.0	24
7.3	8.8	11	14.7	22
6.7	8.0	10	13.3	20
6.0	7.2	9	12.0	18
5.3	6.4	8	10.7	16



SERVICE FACTOR b																							
1	16	18	20	22	24	26	28	30	34	38	42	46	50	60	70	80	90	100	130	160	190	220	250
1.5	10.7	12.0	13.3	14.7	16.0	17.3	18.7	20.0	22.7	25.3	28.0	30.7	33.3	40.0	46.7	53.3	60.0	66.7	86.7	107	127	147	167
2	8	9	10	11	12	13	14	15	17	19	21	23	25	30	35	40	45	50	65	80	95	110	125
2.5	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	13.6	15.2	16.8	18.4	20.0	24.0	28.0	32.0	36.0	40.0	52.0	64.0	76.0	88.0	100
3	5.3	6.0	6.7	7.3	8.0	8.7	9.3	10.0	11.3	12.7	14.0	15.3	16.7	20.0	23.3	26.7	30.0	33.3	43.3	53.3	63.3	73.3	83.3

BENDING MOMENT – IN THOUSANDS OF INCH POUNDS

1stSource Inc. PRODUCTS

Other Products

Other quality material handling products available from 1stSource Products, Inc. include:

E-Trac™ Enclosed Track Conveyor Equipment

- E-Trac-6 6" pitch enclosed track conveyor equipment
- E-Trac-8 8.125" pitch enclosed track conveyor equipment
- E-Trac Lite 6" pitch roundtube enclosed track conveyor equipment
- E-Trac-Q1 Side x side power & free equipment
- E-Trac-Q2 Over / under power & free equipment

X-Trac I-beam Monorail Equipment

- X-348 3" I-beam monorail equipment
- X-458 4" I-beam monorail equipment
- X-678 6" I-beam monorail equipment

Package Handling Equipment

- Ball transfer tables
- Belt conveyors
- Chain transfers
- Flexible / expandable conveyors
- Flow rails
- Roller conveyors (gravity and powered)
- Skatewheel conveyors
- Tire retread equipment www.1stsourceretread.com
- Turntables

Replacement Components

- Ball transfers www.1stsourceballtransfers.com
- Bearings www.1stsourcebearings.com
- Chain
- Casters
- Rollers
- Skatewheels
- Sprockets
- Trolleys

Other Product Lines

- Dura-Max Fence & Gate Hardware www.1stsourcefence.com
- 1stSource Industrial Hardware & Tools www.1stsourcetools.com
- 1stSource Industrial Hinges www.1stsourcehinges.com

1stSource Products, Inc. also has an OEM division specializing in prototyping and development of high quality subcomponents and complete assemblies for many different industries.

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