

TOWER LADDER SAFETY DEVICE

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1. GENERAL

1.01 The Tower Ladder Safety Device, when used with the Tower Body Belt (See Figure 1) is designed to provide an additional aid to personnel climbing certain structures, such as towers, antenna supports, etc. The device should be incorporated into these installations when its use is dictated by local conditions.



FIG. 1

2. DESCRIPTION

2.01 The Tower Ladder Safety Device and the Tower Body Belt are designed as two interrelated assemblies which must be used together. The Tower Ladder Safety Device consists of two parts: (1) a carrier rail and (2) a sliding sleeve.

2.02 The Carrier Rail is permanently attached to the tower, pole or ladder to be climbed.

2.03 The Carrier Rail is formed from 1 inch steel pipe, notched at 7 inch intervals.

2.04 The rail is provided in sections 21 feet long. The sections may be joined together to provide a rail of any length required.

2.05 The Carrier Rail is secured to the various structures by means of attaching hardware as illustrated in part three. The carrier rail with appropriate attaching hardware is supplied as a unit. Orders for the rail shall include specific attaching information for each installation.

2.06 The Sliding Sleeve (Figure 2) slides freely, either up or down the carrier rail, whenever pressure is applied as in a normal climbing operation.

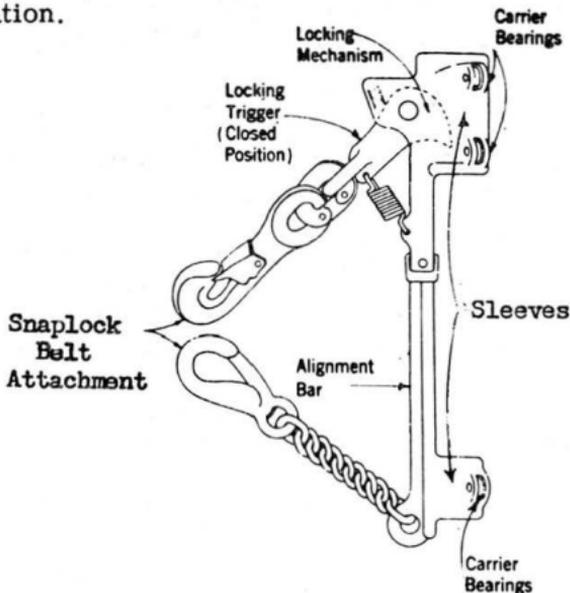


FIG. 2
SLIDING SLEEVE

- 2.07 A locking mechanism in the sleeve automatically locks into the notches on the rail whenever pressure is applied on the sleeve in any direction other than from the normal climbing position. The locking action will prevent downward movement of the sleeve until a normal operating pressure is re-applied.
- 2.08 Two snaplocks, attached to the sleeve, are used to secure the sleeve to the Tower Body Belt.
- 2.09 The Sliding Sleeve is removable from the carrier rail and may be used on any similarly equipped installation.

3. INSTALLATION

- 3.01 Whenever practical, the carrier rail should be installed on the structure (ladder, pole and some towers) before the structure is raised. Protect the rail as necessary to prevent damage during the raising operation.
- 3.02 On wood poles, stepped in accord with Bell System Practices, start the carrier rail about 2 feet above the ground line. On other type of installations start the carrier rail between 7 1/2 and 8 feet above the bottom of the structure unless otherwise specified. Extend the carrier rail to the determined height of work operation. The carrier rail should not extend above the top of a structure, except at landing platforms or unless otherwise specified.
- 3.03 Three special sections of carrier rail are included with the standard rail sections for all installations over 21 feet in length. Use the appropriate attaching hardware and install the special section as follows:

(a) The "Bottom Section," identified by a yellow band at the ends, should be placed first.

(b) The "Top Section," identified by a red band should be the last section installed. Attach the rail to structure in the normal manner. In addition, place an extra attaching device near the uppermost point of attachment on the structure. These two points of attachment shall be made as close to the top of the carrier rail as possible. A 5/16" x 2" bolt with wing-nut is provided with the rail. Install bolt through pipe near top of rail to prevent sleeve from coming off rail. The bolt may be withdrawn to remove sleeve, if required.

(c) The section marked "For Angle," identified by a blue band at the ends, is included for installations which might require a slight angle or curve. This section can be bent by hand to fit the required angle and the carrier rail will form a smooth curve over which the sliding sleeve can operate. Attach rail to the structure near point of angle. If this angle section is not required for an angle or curve, it may be used as an ordinary straight section in the installation.

3.04 Installations with extended curves require Preformed Rails formed at the factory to the specified radius and length of curve. Use appropriate attaching hardware and secure the rail to the structure in a normal manner.

3.05 All carrier rails must be installed with sloping part of the notch pointing upward. The rails must be attached in a straight line in the center of the ladder or centered between pole steps on stepped structures.

3.06 The top of each length of carrier rail is equipped with a 4" connecting strap which is used to hold two adjacent sections of carrier rails together. A 6" inside alignment sleeve is provided to assure a smooth connecting joint. (Figure 3)

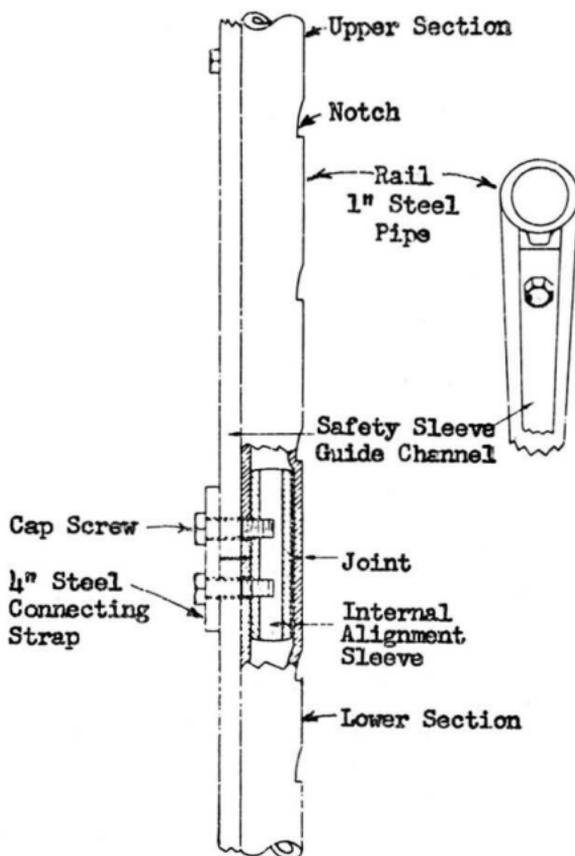


FIG. 3

CARRIER RAIL

Method of joining two sections together

3.07 Before raising any carrier rail into position, loosen the cap screw holding the connecting strap to the pipe. Slip the inside alignment sleeve 3 inches into the top end of the pipe. Position the sleeve so that the cap screw, when tightened, will extend through the bottom hole in the sleeve. Place the strap along the pipe with the slotted hole in the strap extending beyond the top of the rail. Tighten the cap screw to hold the connecting strap and alignment sleeve in place.

3.08 RAISE ONLY ONE LENGTH of carrier rail at a time. The joint couplings may be damaged if two or more lengths are raised while connected.

3.09 Attach each 21 foot section of carrier rail to supporting structure at a minimum of three places. The first attachment shall be made approximately one foot from the bottom of each section. Make the other attachments at approximately seven foot intervals up the rail. Make intermediate attachments as required for bends, curves, Top Section, Etc.

3.10 Carrier rail sections of 14 feet or less in length shall be attached to a structure at a minimum of two places. Locate the points of attachment as outlined in paragraph 3.09.

3.11 Install the carrier rail on ladders as follows:

- (a) Attach the carrier rail to ladder by use of ladder rung clamps provided with the rails. (Figure 4)

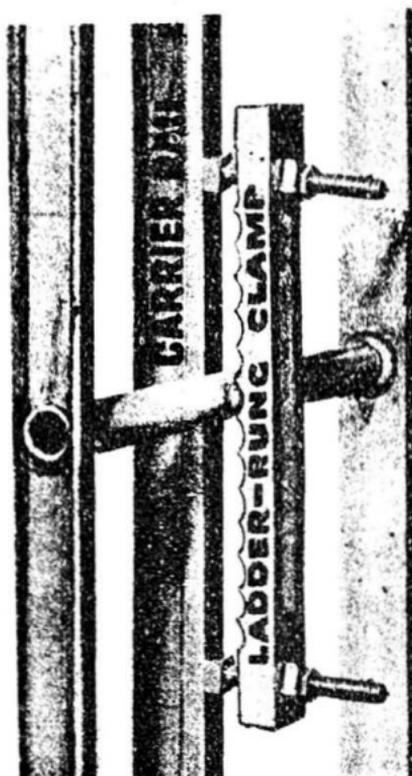


FIG. 4
LADDER INSTALLATION

- (b) Place bottom section of carrier rail in position on the ladder.
- (c) Select two stud holes in the carrier rail guide channel enclosing a ladder rung as near bottom of carrier rail as possible.
- (d) Remove the cap screws from these holes. Place a 4" stud bolt into each of the two holes. Tighten each bolt until the shoulder nut is snug against the guide channel.
- (e) Place a serrated ladder rung clamp behind the ladder rung and over the two stud bolts. Place a flat washer and a square nut on each stud bolt to secure the rung clamp.

(f) Hold the ladder rung clamp in position parallel to the carrier rail while the square nuts at both ends of the clamp are drawn up firm and evenly. Place a hex-lock-nut back of each square nut.

(g) NOTE CAREFULLY: The ladder rung clamp must be drawn up evenly over the stud bolts. Tighten the nuts, at each end of clamp, equally. Unequal tightening will cause the rung clamp to be drawn up at an improper angle, distributing uneven pressure on the studs. It will also result in a disorderly appearing installation.

(h) When first length of carrier rail has been installed, raise the next length and slip its bottom end down over the alignment sleeve. Secure the 4" connecting strap to bottom end of the new length of carrier rail with a cap screw. Tighten cap screw so the 4" strap is firm against guide channel, and creates a smooth union for the safety sleeve to pass over.

(i) Secure this new section of carrier rail to the ladder with ladder rung clamps before another section of rail is added. Continue adding sections of carrier rail in this manner to top of ladder.

3.12 The last section of carrier rail placed on an installation ending at a platform shall be modified and installed as follows. This permits climber to rotate around carrier rail and stand on platform. (See Figure 5)

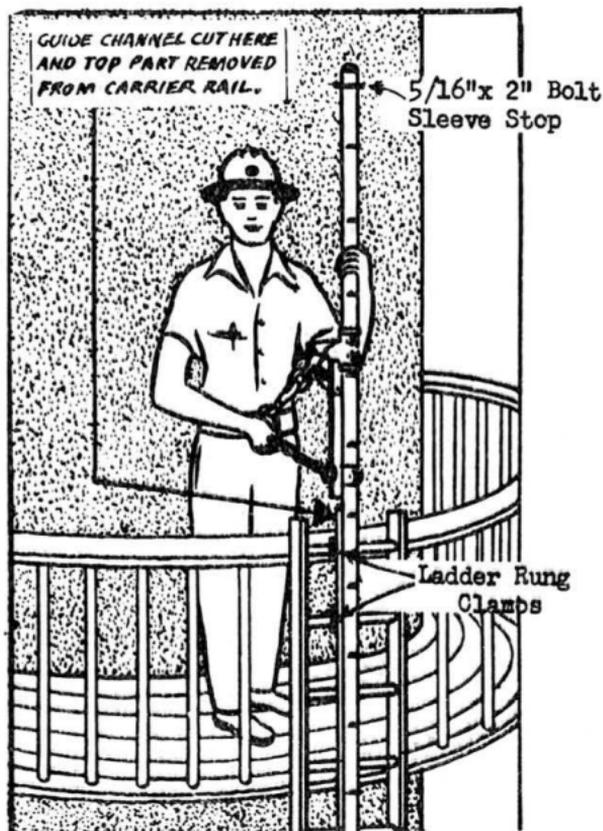


FIG. 5

- (a) The rail section shall be of sufficient length to start at least four feet below the top of the ladder and extended approximately four and one half feet above the top of the ladder.
- (b) Cut the guide channel, on back of pipe, approximately two feet above floor of platform. Remove the top part of guide channel from pipe.
- (c) Secure the carrier rail to the ladder in the same manner as outlined for attaching the Top Section.

3.13 Attach carrier rail on stepped structures as illustrated in Figure 6.

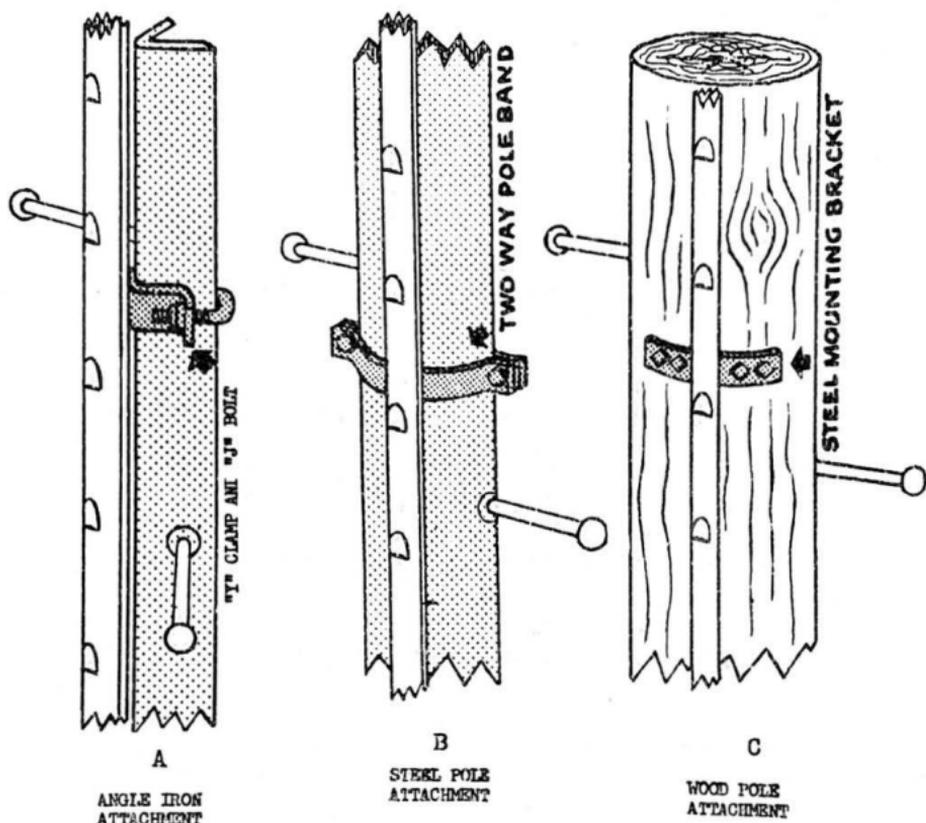


FIG. 6

STEPPED STRUCTURE INSTALLATION

- 3.14 Install the carrier rail on stepped structure as follows.
- (a) Secure the rail to angle iron tower legs by means of "Y" clamps and "J" bolts (Figure 6A). Attach the "Y" clamps to the carrier rail by a stud bolt which is welded to the clamp. Fasten the clamp to the angle iron tower leg with two "J" bolts.
 - (b) Fasten the rail to tubular steel poles by means of Two Way Pole Bands. (Figure 6B) Attach one half of the pole band to the carrier rail by means of a stud bolt. Place the other half around the pole and use the bolts, provided with the hardware, to draw both halves of bands firmly together.
 - (c) Attach the rail to a wood pole by means of Steel Mounting Brackets. (Figure 6C) Secure the brackets to the rail by a stud bolt. Fasten the bracket to the pole with four 3/8" x 4" drive screws.
 - (d) Fasten the attaching hardware to the carrier rail before placing the rail on the structure.
 - (e) Install the attaching hardware on the carrier rail as follows:
 - (1) First select the stud hole, in the guide channel, closest to the point of attachment.
 - (2) Replace the cap screw with a stud bolt welded to the "Y" clamp or placed through the center hole in the other attaching hardware.
 - (3) Tighten the stud bolt until the hardware is snug and perpendicular to the guide channel.
 - (f) Place the bottom section of carrier rail in position and attach it to the structure at the two lower points of attachments on the rail.
 - (g) Raise the next section of rail into position on the structure. Join the two sections together by use of the alignment sleeve and connecting bar, as outlined under Ladder Installation. Attach the new section to the structure at the two lower points of attachment and then completely secure the adjacent lower section.
 - (h) Continue adding sections of carrier rail in this manner until the required length is reached.

3.15 Carrier rails placed on wood poles shall be bonded to the pole grounding system as follows:

- (a) Bond the ground wire to the rail near the top, in the middle and near the bottom of the rail.

Note: Do not make bond at joint between two rails or where attaching hardware is fastened to the rail.

- (b) Use a short length of No. 6 ground wire to bond rail to vertical ground wire on pole.

- (c) At point of bonding on rail, remove the cap screw holding guide channel to rail. Place the cap screw through a 7/16" x 1" round washer and replace cap screw into rail.

- (d) Remove approximately two inches of insulation from both ends of No. 6 ground wire. Bend one end of wire around cap screw between guide channel and washer. Do Not Cross the Wire Under the Washer. Tighten cap screw until it is snug.

- (e) Remove approximately two inches of insulation from vertical ground wire on pole. Use Fargo connector to bond both wires together.

4. USE AND PRECAUTION

4.01 The Tower Body Belt is the only safety belt which may be worn while the climber is using the Tower Ladder Safety Device.

4.02 The Tower Safety Strap or the C Safety Strap are the only safety straps which may be used in conjunction with the Tower Body Belt to facilitate work operations.

4.03 Before each use of the Tower Ladder Safety Device, visually inspect the carrier rail from the ground. Be certain that all of the attaching hardware is properly fastened to the structure and that nothing will obstruct the free movement of the Sliding Sleeve.

- 4.04 Inspect the Sliding Sleeve. It should be free of damage to the metal. Check the locking mechanism and carrier bearings to be sure they operate freely. Be certain that the sleeve will slide easily on the rail.
- 4.05 Inspect the Tower Body Belt and Tower Safety Strap or C Safety Strap as outlined in the practice under Nylon Body Belts and Fabric Safety Straps. In addition, be certain that the leather slide on the Tower Body Belt is placed on the belt in the proper manner as described in the practice covering the Tower Body Belt.
- 4.06 Personnel using the Tower Ladder Safety Device shall proceed as follows:
- (a) Buckle the tower body belt tightly enough around waist to take out slack.
 - (b) Secure belt to sliding sleeve by attaching the two snaphooks on the sleeve to the rectangular steel ring on the belt.
 - (c) Slip the sliding sleeve onto the carrier rail so that the locking end of sleeve is up.
 - (d) Climb structure in a normal manner and lean back into the body belt going up or down. This is restful and takes the weight off climbers hands and feet.
 - (e) Do not allow locking trigger to drag on pipe of carrier rail.
- 4.07 The climber should remain attached to the safety device during work operations within his normal reach. If greater freedom of movement is desired use the Tower Safety Strap or C Safety Strap as outlined below:
- (a) Use the Tower Safety Strap only on structures equipped with either vertical or horizontal safety strand.
 - (b) Use the C Safety Strap only when it can be placed around an adequate support (pole, tower leg, crossarm, etc.)
 - (c) Secure the safety strap snaplocks to both "Dee" rings of tower body belt before releasing the tower body belt from the sliding sleeve.

Note: The sliding sleeve will automatically engage in the nearest lower slot on the rail and hold in position on the structure.

(d) Comply with all other instructions covering use of the safety straps.

4.08 A climber, using a Tower Ladder Safety Device installed on an access to a platform shall be standing safely on the platform before unsnapping body belt from sliding sleeve. The user shall also re-attach to the sliding sleeve before leaving the platform to change vertical position on the structure.

4.09 The Tower Ladder Safety Device will operate under all weather conditions except when icing occurs. Under this condition the sleeve will not fit onto the rail. Climbing and working aloft would be hazardous in any event during icing conditions and should be avoided.

4.10 At locations where it is absolutely necessary to work aloft during icing conditions, a de-icing unit can be installed. The unit is an electrical heating element which is permanently attached to the carrier rail.

4.11 Operate the heating unit only as required to free the rail of ice during the climbing and work operation. Prolonged use of the de-icing unit causes additional ice to form on other portions of the structure and increases the possibility of damage to the plant.

4.12 During icing conditions, wear head protection and be alert to avoid ice which may fall from the structure. Exercise extreme caution against slipping while climbing and working aloft.

4.13 In all cases, follow the safety procedures outlined in other sections of the practices covering climbing and working aloft.