

GUYING

INSTALLING GUYS

EYE BOLT METHOD

Contents	Page
SIZES OF EYE BOLTS AND WASHERS.....	1
NUMBER OF GUY CLAMPS AND METHOD OF INSTALLING...	2
USE OF GUY STRAPS.....	2
SERVING ENDS OF GUYS.....	2
ATTACHING GUYS TO POLES AND STUBS.....	3
ATTACHING GUY TO ROD.....	6
ATTACHING GUY TO TREE.....	6
POSITION OF GUYS IN AERIAL CABLE LINES.....	8
ATTACHING GUYS TO POLES IN OPEN WIRE LINES.....	14
SPECIAL GUYS.....	17
PULLING UP ANCHOR GUYS.....	19
PULLING UP GUYS TO STUBS.....	20
INSTALLING GUY PROTECTORS.....	21

1. SIZES OF EYE BOLTS AND WASHERS

- 1.01 Use the following sizes of eye bolts and washers for attaching guys to poles and stubs.

Guy Strand (Pounds)	Thimble Eye Bolt (Inches)	Curved Washer	Guy Strap Type
6000	(Length) \times 5/8	B	None
10000	(Length) \times 3/4	E	S
16000	(Length) \times 1	C	S
25000	(Length) \times 1	C	B

2. NUMBER OF GUY CLAMPS AND METHOD OF INSTALLING

2.01 Use the following number of guy clamps in attaching guys to eye bolts and guy rods.

Size of Strand (in Pounds)	Number and Type of Guy Clamps
2,200	1 Bolt Clamp
6,000	1 - 3 Bolt Guy Clamp
10,000	1 - 3 Bolt Guy Clamp
16,000	2 - 3 Bolt Guy Clamps
25,000	3 - 3 Bolt Guy Clamps

2.02 The method of installing guy clamps is as follows:

- (1) Bend the main part of the guy and tail so that the portions to be placed in the grooves of the clamp will be parallel with each other.
- (2) Place the clamp on the strand. Where more than one clamp is required, butt the clamps together.
- (3) Tighten each nut until it bears firmly on the clamp side. The chamfered sides of the nuts should be against the clamp.
- (4) After this preliminary tightening of all nuts, turn each nut down as far as practicable.
- (5) Where it is convenient and practicable, tighten the bolts of the clamps again after the guys are under tension.

Note: Where strain insulators are to be placed in the guy, and where the guy can be attached to the eye bolt on the ground, the tightening of the bolts will be facilitated if the clamp is held in a vise, or the eye of the strand is hung over a pole step during the tightening operation.

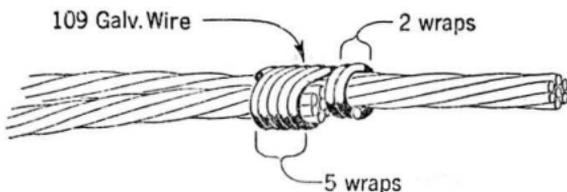
3. USE OF GUY STRAPS

3.01 Use B Guy Straps with 25,000-pound anchor guys and S Guy Strap with all other anchor guys larger than 6,000-pound strand. Attach the straps as shown in Paragraph 5.01.

3.02 Use storm guy straps as shown in Paragraph 9.03 where it is desired to attach anchor guys on opposite sides of the pole.

4. SERVING ENDS OF GUYS

4.01 Secure end of tail of guy, except galvanized wire guys, by means of 109 galvanized wire, as shown below.



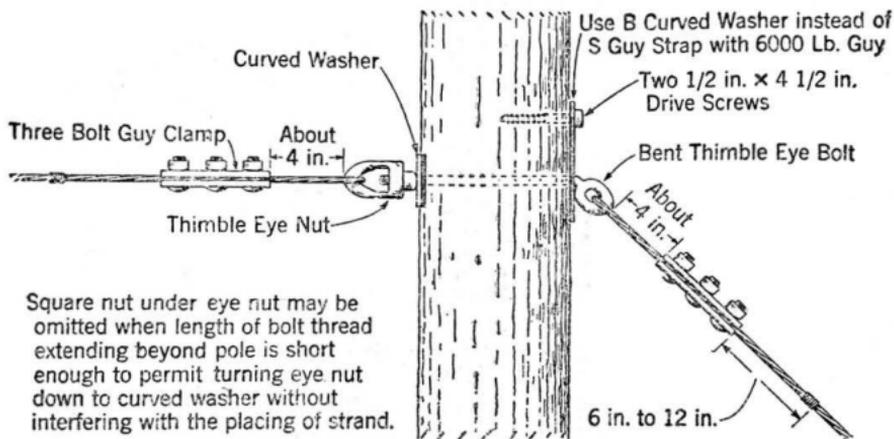
Note: If desired, the tails of 2200 and 6000-pound guys can be served by one wire of the strand.

5. ATTACHING GUYS TO POLES AND STUBS:

5.01 Use bent eye bolts for attaching anchor guys to poles and stubs where the $\frac{\text{Lead}}{\text{Height}}$ is 1-1/4 or less.

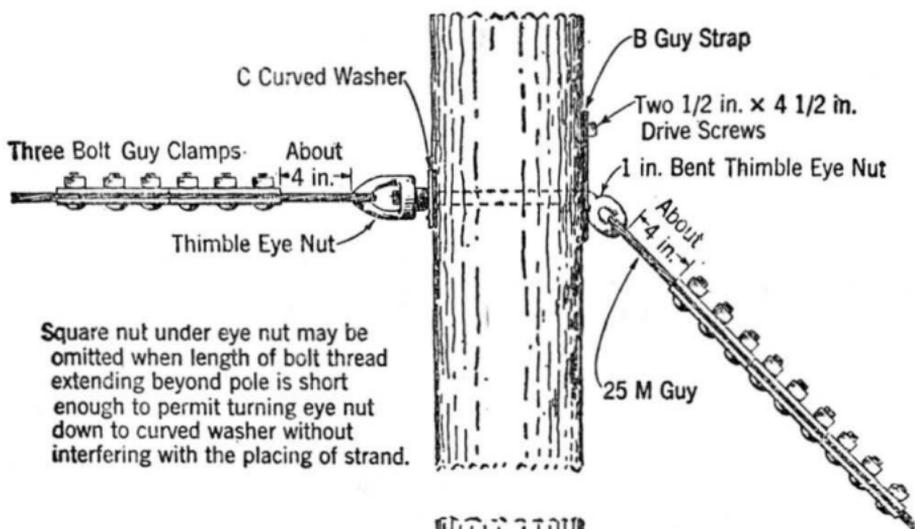
Attachment to Pole or Stub

(1) 16,000-pound Guys and smaller.

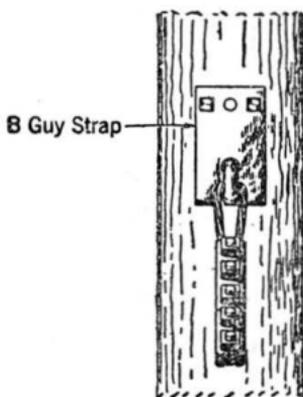


Note: If the eye bolt is located within 16 inches of the top of the pole the guy strap should be reversed with the drive screws below the eye bolt.

(2) 25,000-pound Guy.



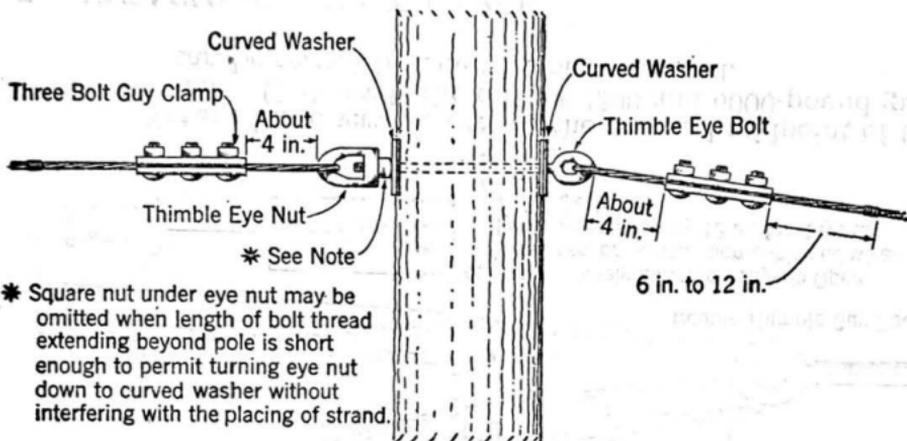
Square nut under eye nut may be omitted when length of bolt thread extending beyond pole is short enough to permit turning eye nut down to curved washer without interfering with the placing of strand.



Note: If eye bolt is located within 16 inches of the top of a pole or stub the guy strap should be reversed with the drive screws below the eye bolt.

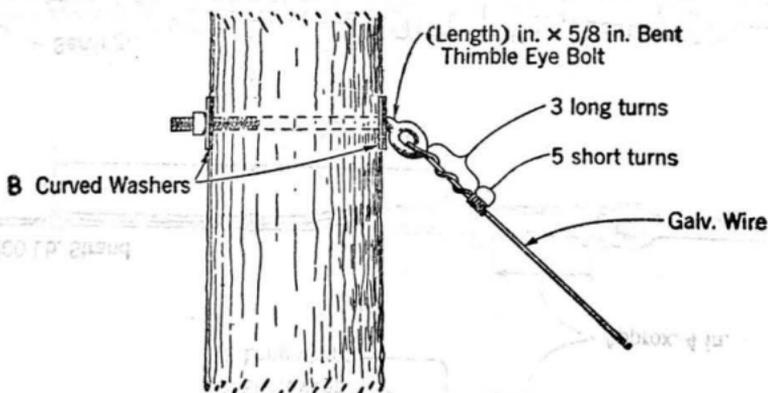
5.02 Use straight thimble eye bolts where $\frac{\text{Lead}}{\text{Height}}$ is more than 1-1/4.

Attachment to Pole or Stub



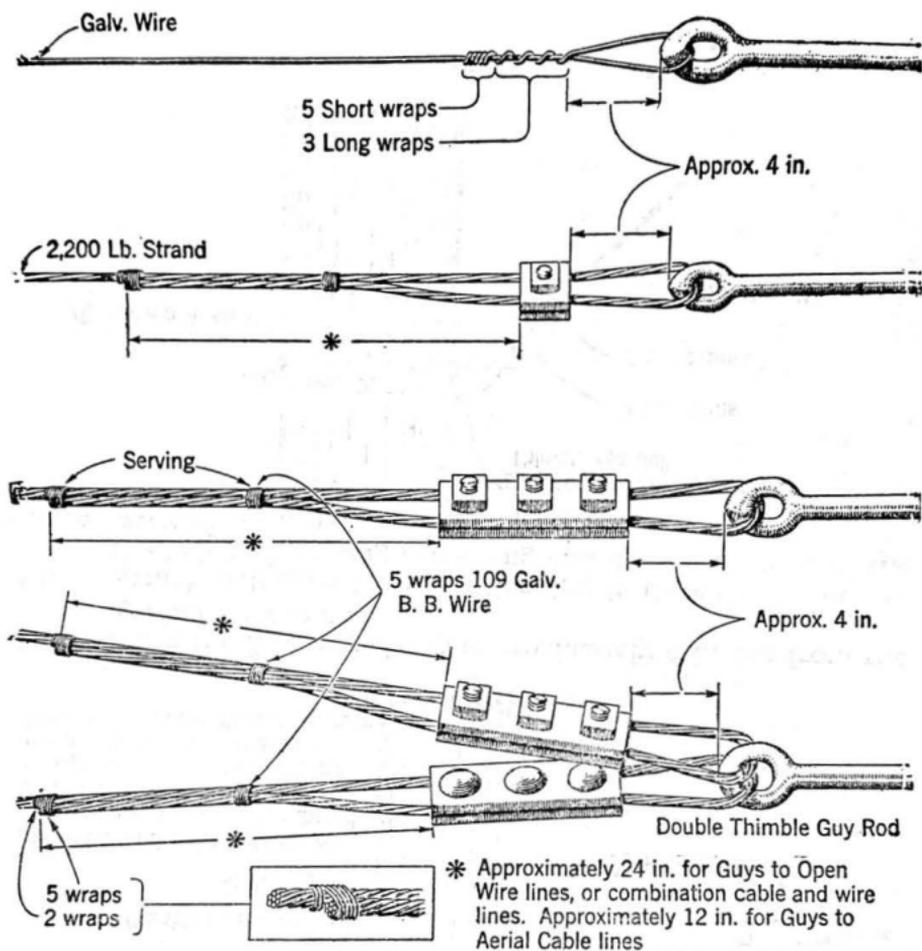
5.03 Place the first guy clamp approximately 4 inches from the eye bolt or eye nut.

5.04 Attach galvanized wire by looping it through the eye of the bolt and making three long and five short turns of the loose end around the guy.



6. ATTACHING GUY TO ROD

6.01 Attach guy to guy rod as shown.



Note: Place serving wire at the end and midpoint of the tail. If desired, the tails of 2200 and 6000-pound guys can be served by one wire of the strand.

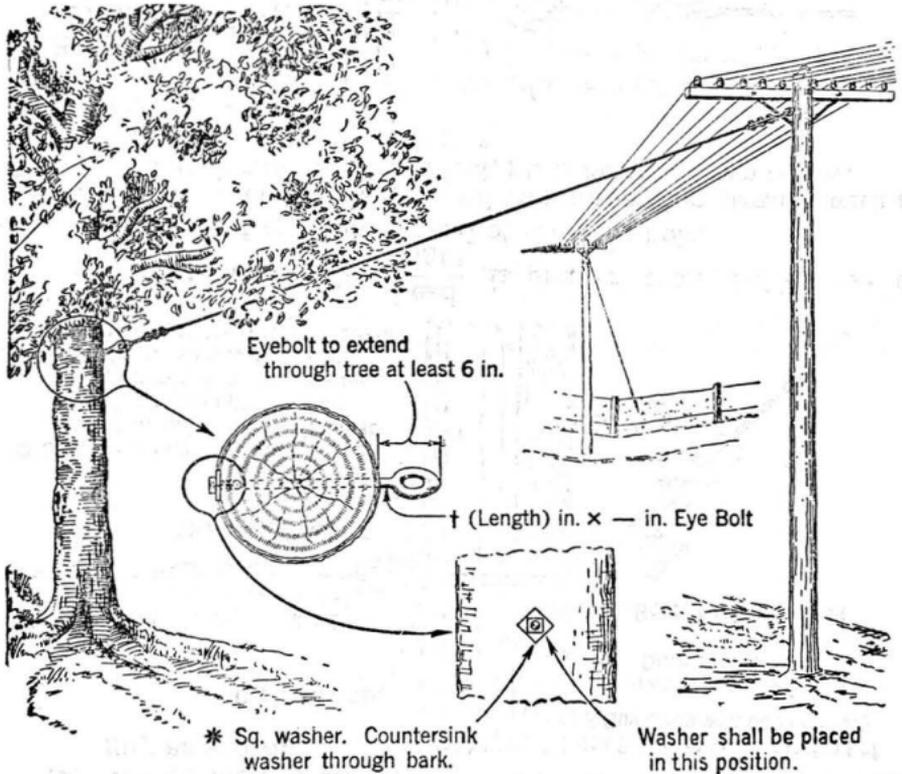
7. ATTACHING GUY TO TREE

7.01 Use tree guys only where anchor guys cannot be placed and when the necessary permission has been obtained. Tree guys should not be used on important toll lines except under emergency conditions or for temporary use.

7.02 Where permission can be obtained, use an eye bolt for making the attachment, as this method of attaching the guy does not injure the tree and is the most satisfactory.

7.03 Attach guys only to sound trees of satisfactory strength. Place the eye bolt through the trunk or a limb as close to the trunk as practicable. If the attachment is made to a forked or crotched tree, select the point of attachment so that the guy will tend to pull the fork or crotch together rather than to split it.

7.04 Make attachment as shown below. The washer is placed as shown in order to permit the bark to grow over it readily. Paint parts of the tree that have been cut with Tree Pruning Compound or similar paint before placing the hardware.



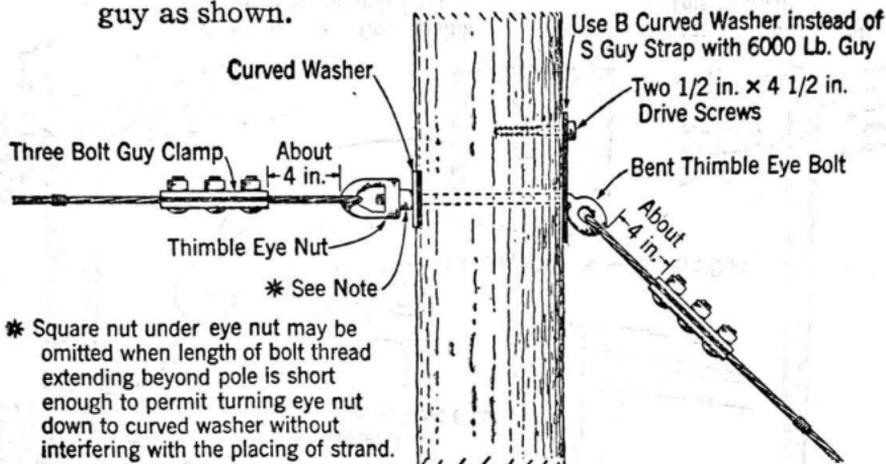
Size of Strand (Pounds)	† Thimble Eye Bolt (Inches)	* Sq. Washer (Inches)
6,000	5/8	3/4 x 3
10,000	3/4	7/8 x 3 1/2
16,000	1	1-1/8 x 4
25,000	1	1-1/8 x 4

8. POSITION OF GUYS IN AERIAL CABLE LINES

8.01 Place strain insulators in all guys that are not electrically separated from the suspension strand by at least 4 inches (see Paragraph 3.02, Section G23.140).

8.02 Attach guys to dead-end poles as illustrated below.

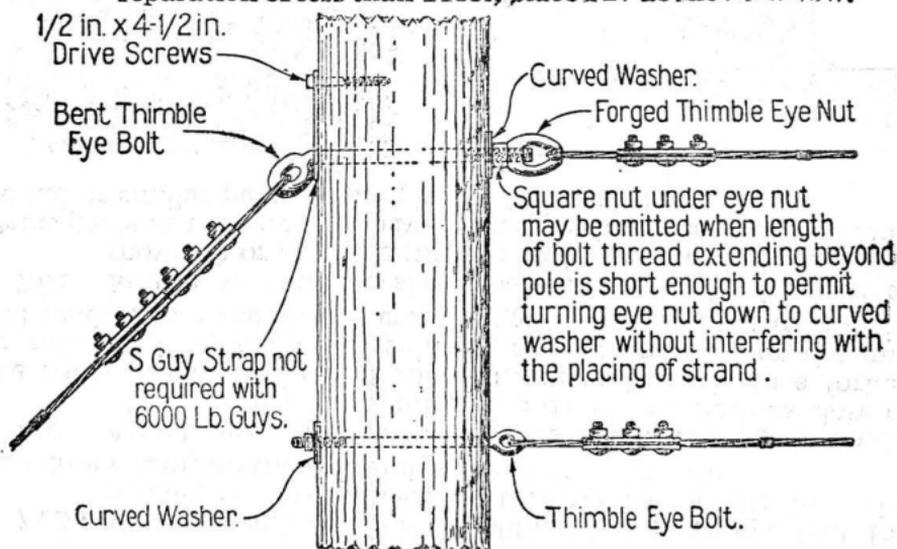
(a) Where there is one suspension strand and one guy, attach guy as shown.



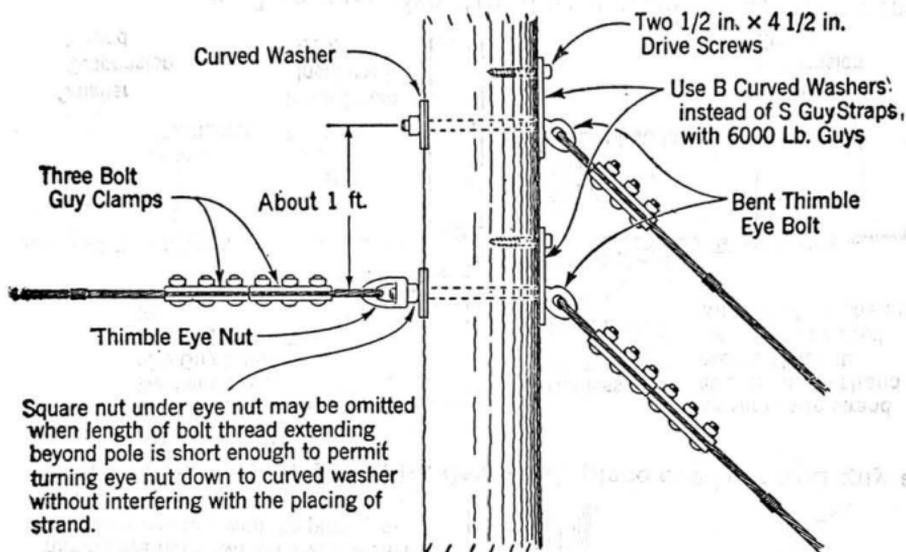
* Square nut under eye nut may be omitted when length of bolt thread extending beyond pole is short enough to permit turning eye nut down to curved washer without interfering with the placing of strand.

Note: Where the $\frac{\text{Lead}}{\text{Height}}$ is greater than 1-1/4, use a straight eye bolt instead of the bent bolt.

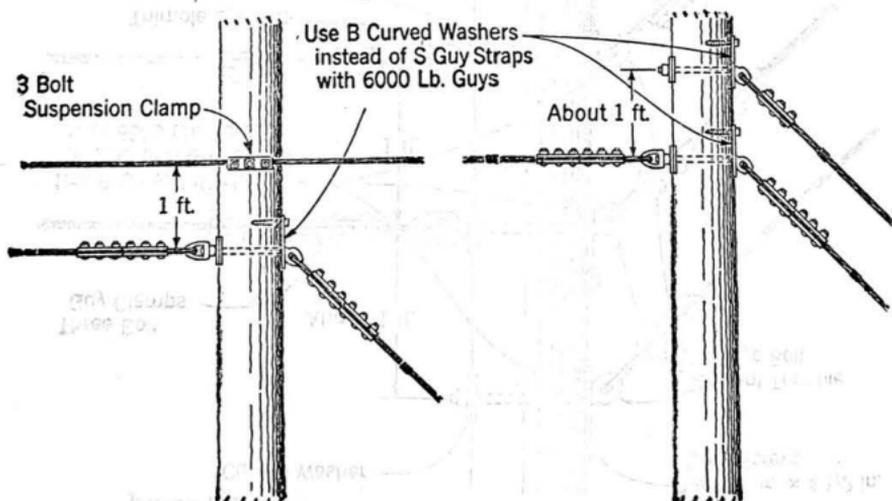
(b) Where there is one guy and two suspension strands with a separation of less than 4 feet, place guy as shown below.



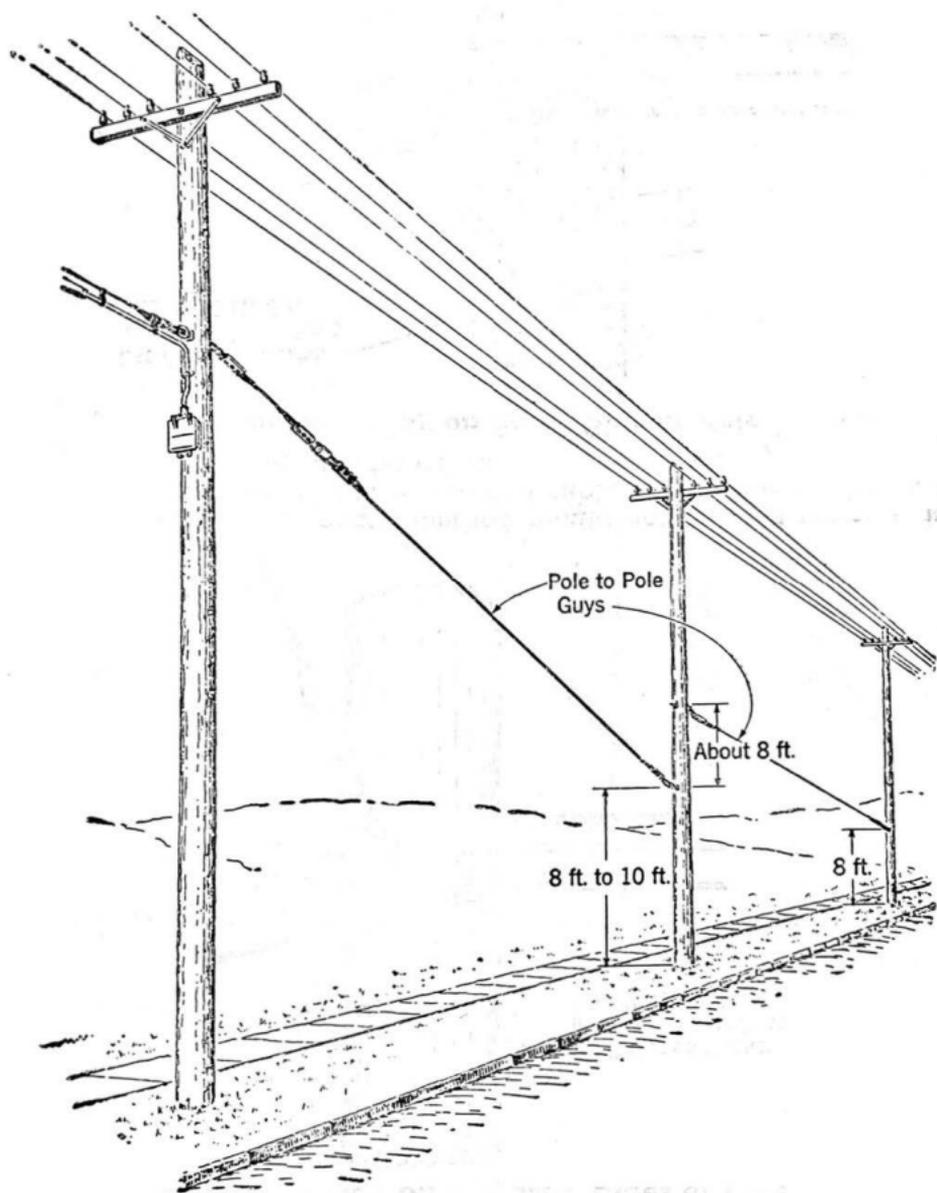
- (c) Where the separation of two suspension strands on the same pole is 4 feet or more, guy each separately.
- (d) Where there is one suspension strand and two guys are required, place guys as shown.



- (e) Where two suspension strands are terminated on adjacent poles, place guys as shown below.

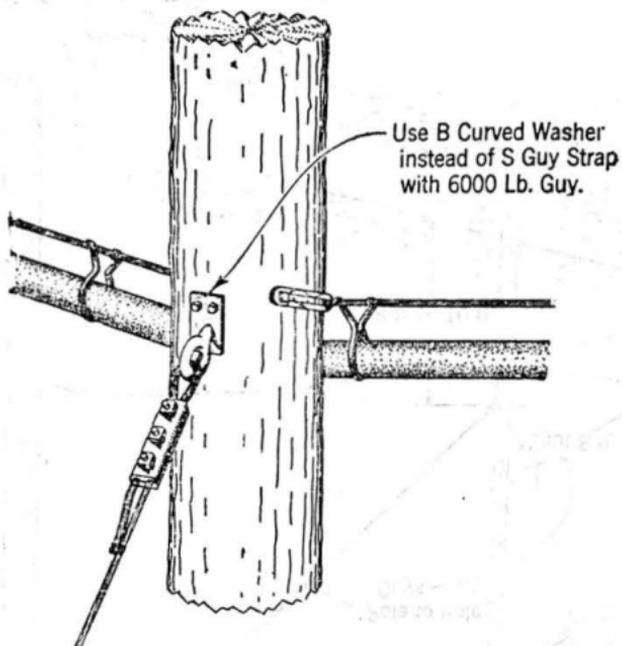


8.03 Attach pole-to-pole guys as shown below.



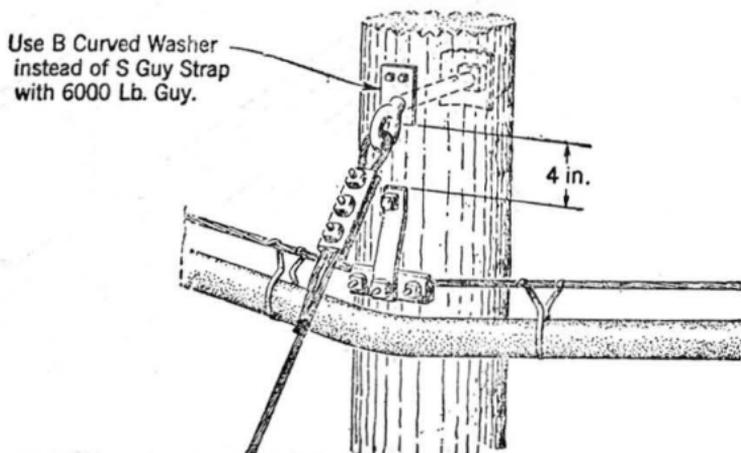
- 8.04 Attach guys to corner poles as shown below.
 (a) Where only side guys are attached to corner pole.

Cable and Guy on Opposite Sides of Pole



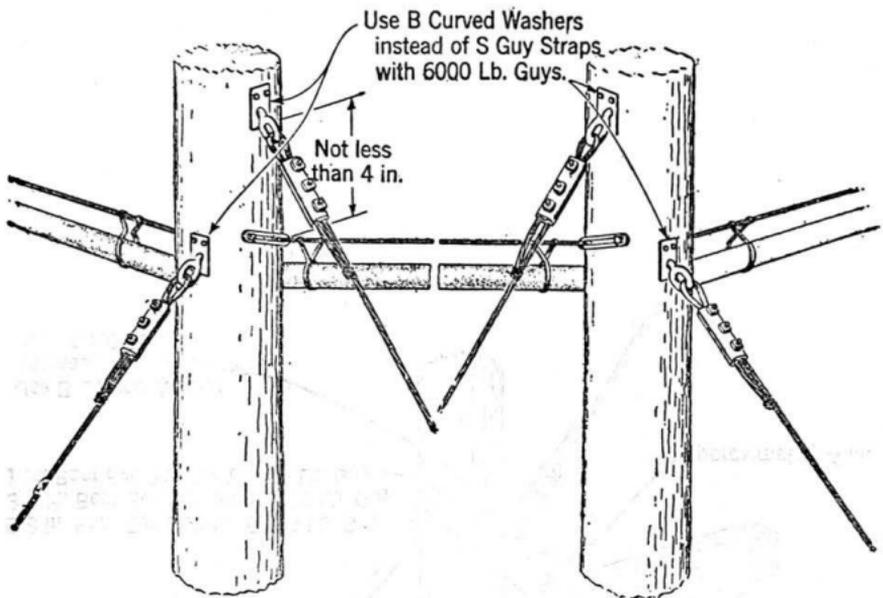
Note: The above method should not be used where it is planned to place a second cable on the side of the pole opposite the first cable.

Cable and Guy on Same Side of Pole



Note: Where an eye bolt is used as the cable suspension bolt, an insulator must be placed in the guy. If two cables are to be placed one on each side of the pole, use a separate bolt for attaching an anchor guy as shown above. Place extra nut on the eye bolt between the suspension clamp and the pole.

- (b) Where head and side guys are attached to a corner pole and if the bent eye bolt used for attaching the side guy can be employed for attaching the suspension strand, make attachments as shown below.

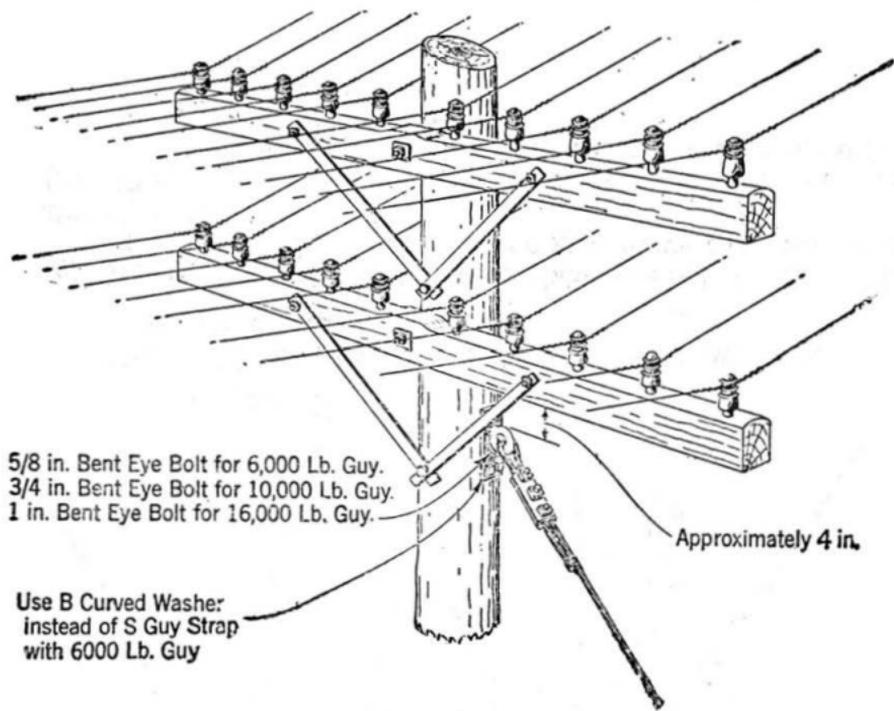


Note: Place extra nut on the eye bolt between the suspension clamp and the pole.

- (c) Where impracticable to use the bent eye bolt for the cable suspension bolt, attach the side guy above the suspension strand, as shown in (a) above.
- (d) Where the separation between two suspension strands on the same pole is 4 feet or more, guy each strand separately.

9. ATTACHING GUYS TO POLES IN OPEN WIRE LINES

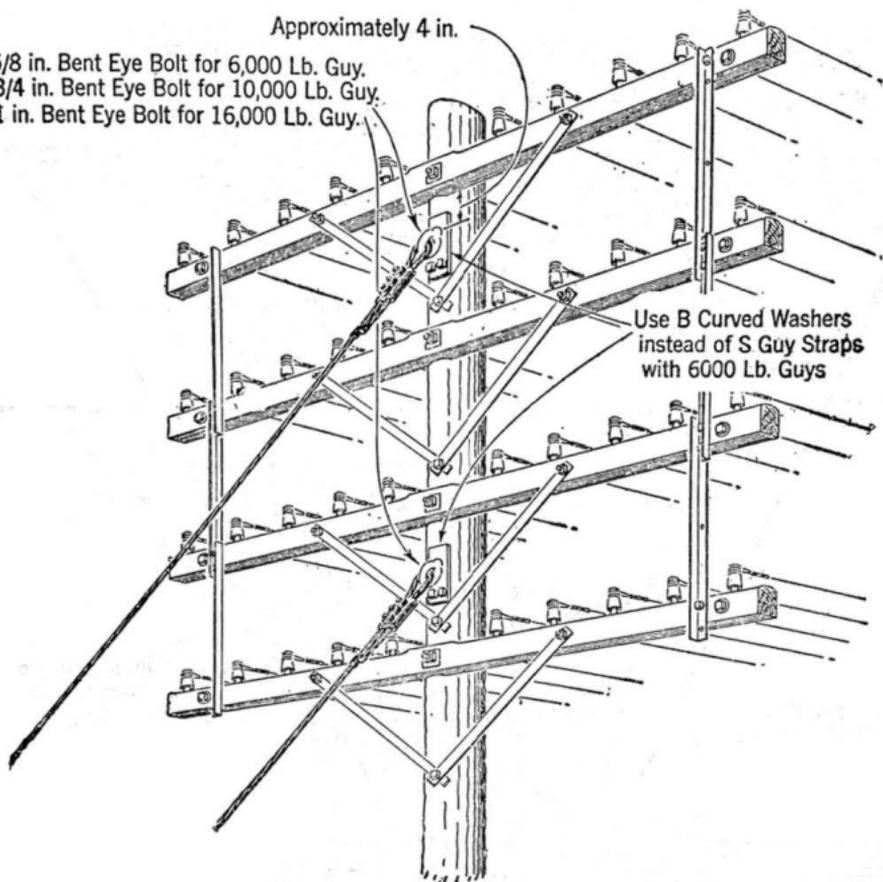
9.01 Place side guys as shown in the following:



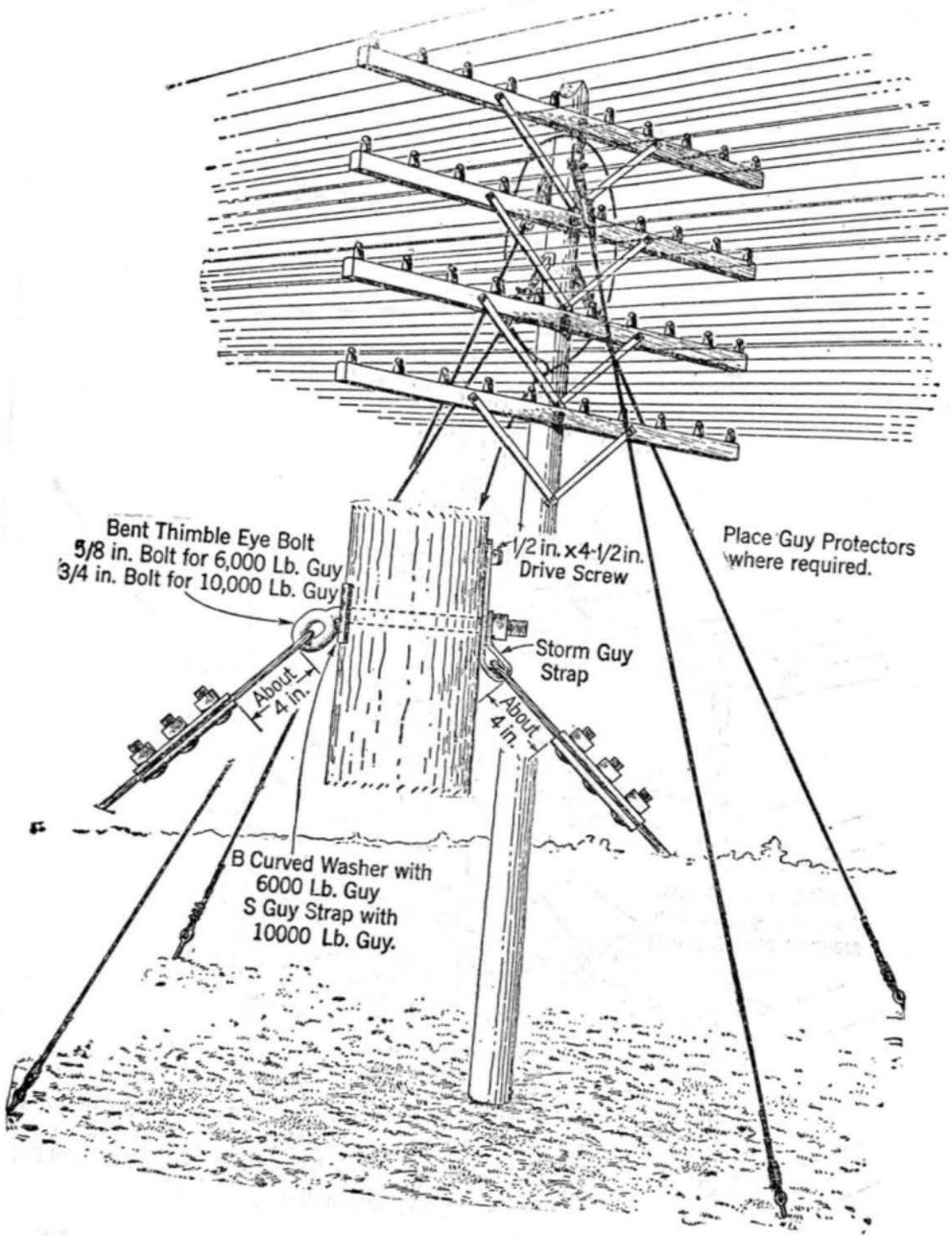
9.02 Attach head guys as shown below.

Approximately 4 in.

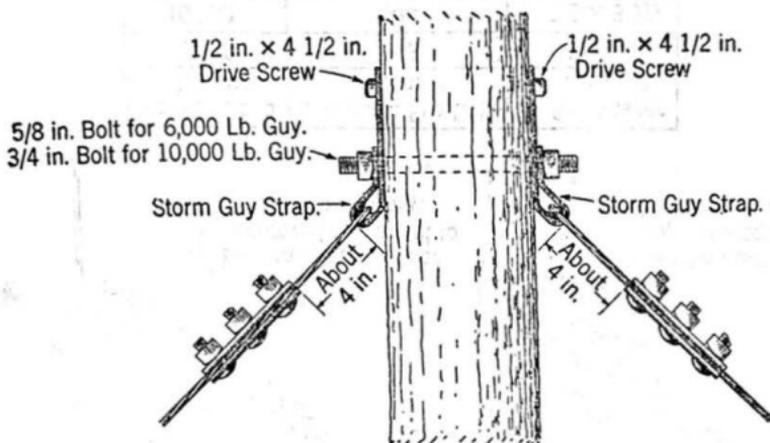
- 5/8 in. Bent Eye Bolt for 6,000 Lb. Guy.
- 3/4 in. Bent Eye Bolt for 10,000 Lb. Guy.
- 1 in. Bent Eye Bolt for 16,000 Lb. Guy.



9.03 Attach storm anchor guys as shown below.



Alternative Method



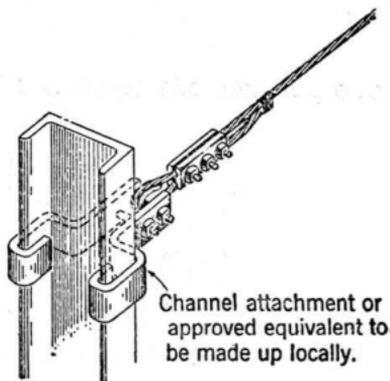
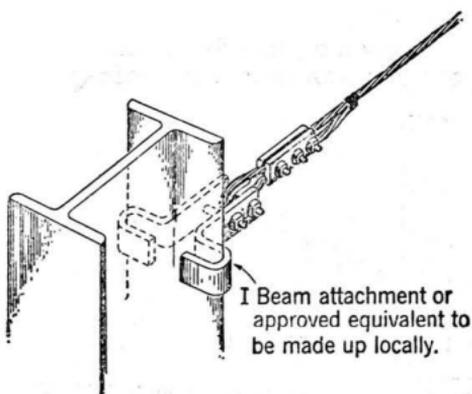
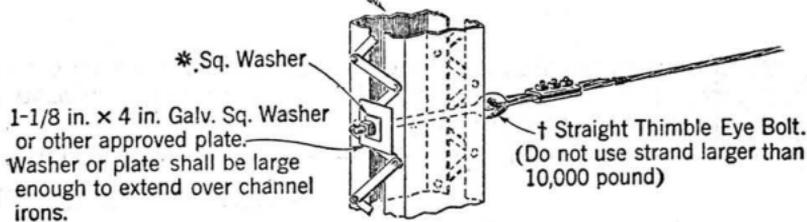
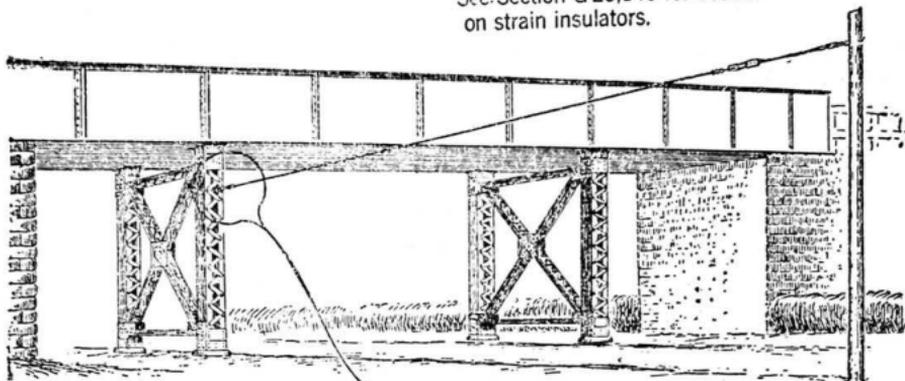
Note: If a stub guy is placed, a straight eye bolt and one guy strap can be used.

10. SPECIAL GUYS

10.01 Attach guys to masonry walls, piers, abutments, bridges, etc., or to the ironwork of bridges and elevated structures where no other method of guying is practicable, provided permission has been obtained and the structure is capable of sustaining the load.

10.02 The method to be used in attaching the guy to the structure depends upon the size of guy strand and the nature and condition of the structure to which the attachment is to be made. A few methods of attaching these guys are shown below.

See Section G-23,140 for details on strain insulators.

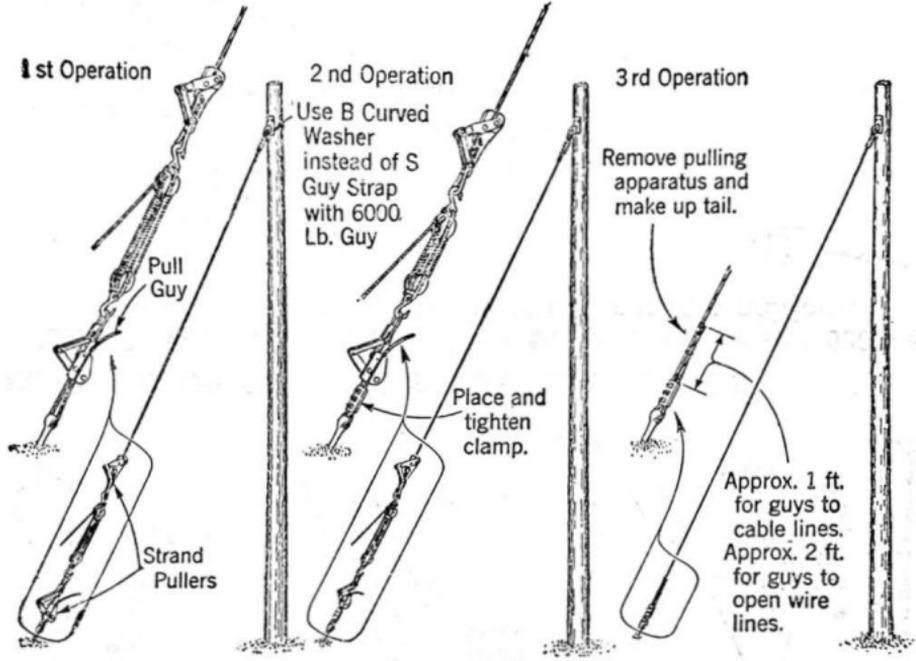


Size of Strand (Pounds)	† Thimble Eye Bolt (Inches)	* Sq. Washer (Inches)
6,000	5/8	3/4 x 3
10,000	3/4	7/8 x 3 1/2

ii. PULL UP ANCHOR GUYS AS SHOWN

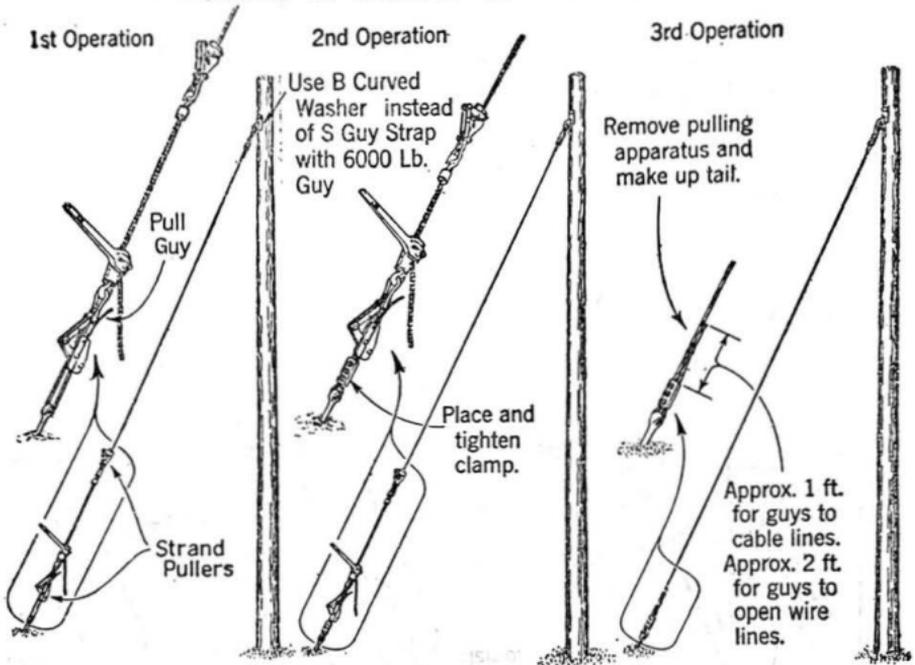
- 11.01 Use L Strand Puller for 6000-pound guys. Use H Strand Puller for 10,000, 16,000 and 25,000 pound guys.
- 11.02 Blocks and Tackle.

PULLING UP STRAND GUY AT GUY ROD



11.03 Chain Hoist.

PULLING UP STRAND GUY AT GUY ROD

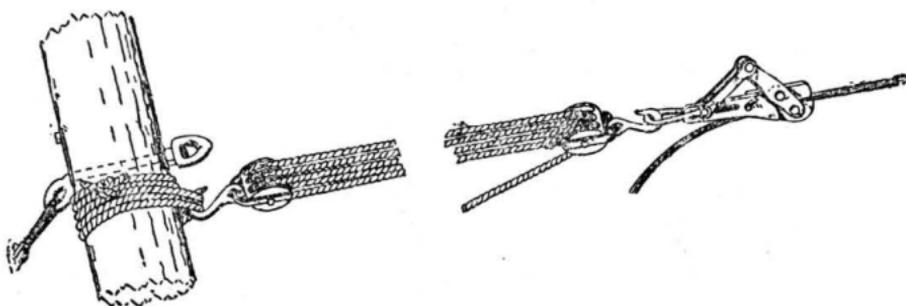


12. PULL UP GUYS TO STUBS AS FOLLOWS

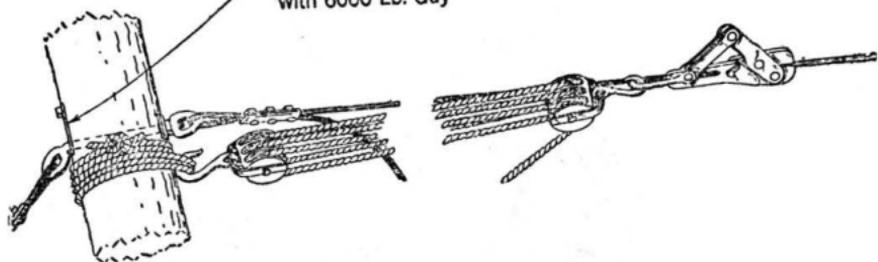
12.01 Where there is no load on the guy and where 6000 or 10,000-pound guys are placed under load conditions.



12.02 Where 16,000 and 25,000-pound guys are placed under load conditions.



Use B Curved Washer
instead of S Guy Strap
with 6000 Lb. Guy



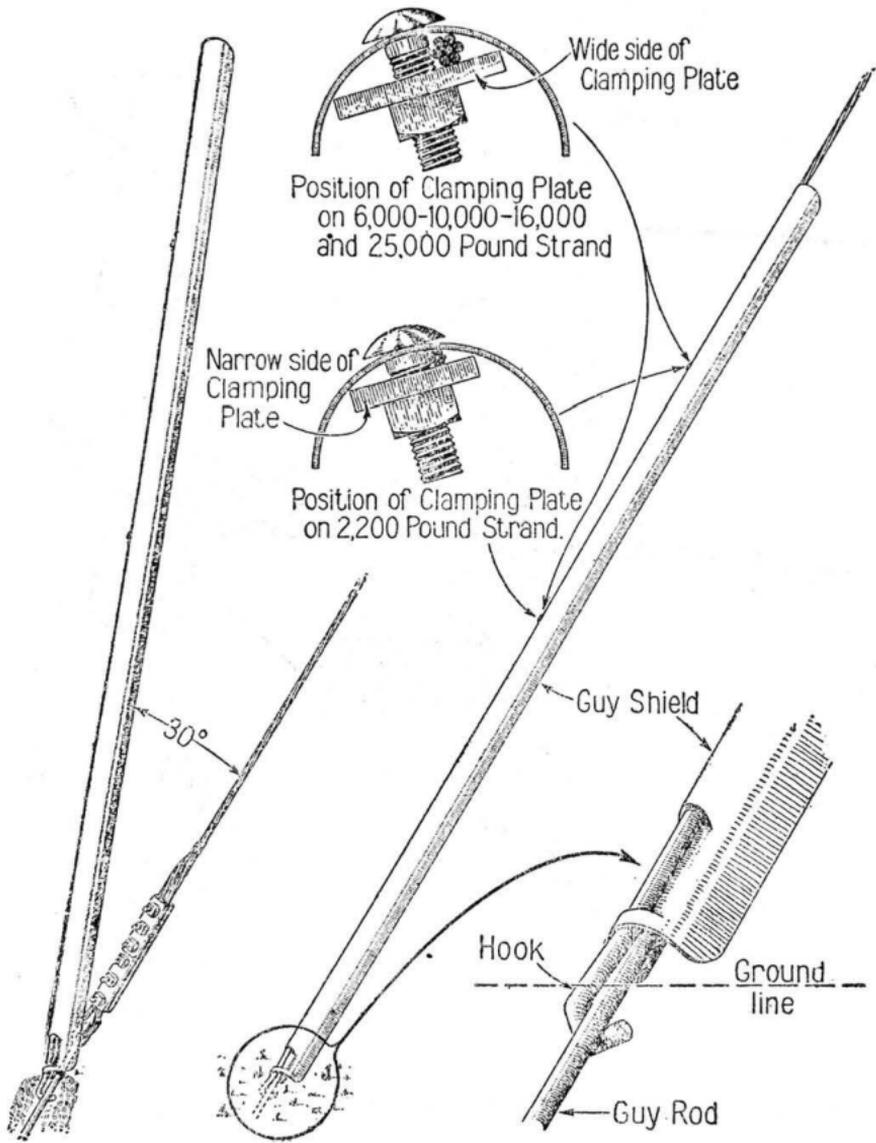
13. INSTALLING GUY PROTECTORS

13.01 Place guy protectors where an anchor guy is so located that persons or animals are liable to run into it. In general, do not place protectors on guys that are close to buildings or fences except where it is thought that their use would tend to keep trucks and other vehicles away from the guys.

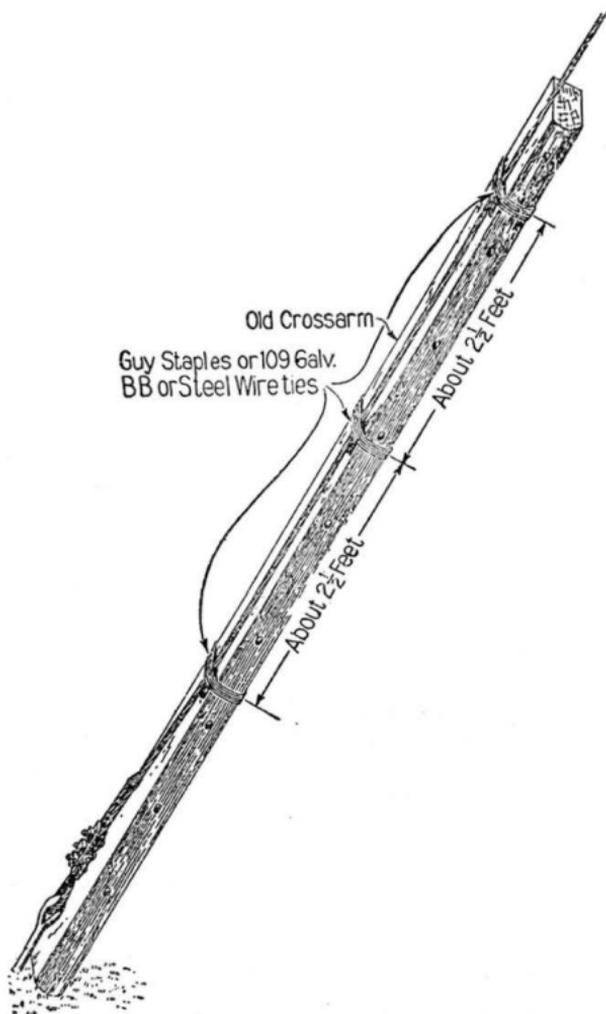
13.02 Equip the guy with a guy shield, wooden molding, old crossarm or other approved guard.

(a) The guy shield usually is preferable. When installing the guy shield, place the hook at the lower end of the guy shield around the guy rod just below the ground line, with the shield at an angle of about 30° below the strand. Press the shield down to the strand, place the strand against the bolts between the clamping plates and the shield with the clamping plates turned to the position shown below, then tighten the bolts.

GUY SHIELD



- (b) Use wooden molding or an old crossarm where appearance will permit.



- (c) Where two or more guys are attached to the same pole one above the other and are separated at the ground line by not more than 12 inches, place a guy protector on the upper guy only.