

## **ATTACHMENTS, FASTENERS, AND METHODS FOR RUNNING WIRE AND CABLE**

### **1.00 INTRODUCTION**

This section covers the attachments, fasteners, and methods, generally employed in the installation of drop and block wire, station wire, ground wire, and inside wiring cable in or on buildings.

### **2.00 GENERAL**

**2.01** Additional detailed information on the attachments, fasteners, and methods for running drop and block wire may be found in the G series of Bell System Practices.

**2.02** Information pertaining to the installation of B multiple drop wire may be found in the G series of Bell System Practices.

### **3.00 BUILDING ATTACHMENTS FOR DROP OR BLOCK WIRES**

**3.01** Tables A and B indicate the drop wire attachments to be used on various types of building walls in heavy, medium, or light loading areas. Local instructions should specify the local loading area. Loading is dependent on weather conditions, e.g., ice, sleet, and snow. The same attachments that are specified for drop wire may be used to attach block wire when it is used instead of drop wire.

**3.02** The 30-degree angle referred to in Tables A and B is the angle formed by the drop wire and the building, shown in Fig. 2. It may be determined visually.

**3.03** Table C indicates the type and number of fasteners used to install drop wire attachments on buildings.

**3.04** Table D indicates the type and size of bolts used to equip drop wire attachments with S or T knobs.

**TABLE A**  
**Drop Wire Attachments on Building Walls**  
**(Heavy Loading Area)**

Mounting Surfaces	Type of Protector Being Used	Number of Drops	First Attachment		Intermediate Attachments	Last Attachment
			Angle Between Drop and Wall			
			Less than 30°	30° and Over		
Wood, Stucco on Wood, or Metallic Siding on Wood	Fused	1 or 2	S Knob for each drop.	S Knob with 5/16-in. Angle Screw for each drop.	5/8-in. Insulated Screw Eyes.	C Knob for each two drops.
		3 or More	Two S Knobs with House Bracket for each two drops.	Two S Knobs with House Bracket for each two drops.		
	Fuseless	1 or 2	Drop Wire Hook.	Drop Wire Hook.	5/8-in. Drive Rings or E Bridle Rings.	E Drop Wire Clamp or No. 4 Cable Clamp.
		3 or More	Drop Wire Hook for each two drops.	Drop Wire Hook for each two drops.		
Masonry, Solid Brick, or Substantial Brick Veneer	Fused or Fuseless	1 or 2	Drop Wire Hook.	Drop Wire Hook.	5/8-in. Drive Rings or E Bridle Rings.	E Drop Wire Clamp or No. 4 Cable Clamp.
3 or More		Drop Wire Hook for each two drops.	Drop Wire Hook for each two drops.			
Thin-wall Brick Veneer (Less than 3-3/4-in. Thickness)		1 or 2	Drop Wire Hook.*	Drop Wire Hook.*	5/8-in. Drive Rings or E Bridle Rings.	E Drop Wire Clamp or No. 4 Cable Clamp.
			S Knob for each drop.	One or two S Knobs with House Bracket.		
3 or More		Drop Wire Hook* or two S Knobs with House Bracket for each two drops.	Drop Wire Hook* or two S Knobs with House Bracket for each two drops.			
		S Knob for each drop.	S Knob with 5/16-in. Angle Screw for each drop.	Toggle Bridle Rings.		
3 or More		Two S Knobs with House Bracket for each two drops.	Two S Knobs with House Bracket for each two drops.			
All Types		1 or More	When necessary to clear a building corner in making first attachment, use an S Knob with Corner Bracket for each drop.			
Steel Structural Framework	1	The No. 505 Universal Support may be equipped with one S Knob and used as a first attachment, provided that the support is so placed that it will be pulled against the structural steel member.				

**Note:** On stucco, tile, metal lath, and thin-wall brick veneer buildings, attachments should be made preferably to secure wood trim. Where this is practicable, make attachments as for wood buildings.

\* Use separate Drop Wire Hook for each drop crossing a highway.

**TABLE B**  
**Drop Wire Attachments on Building Walls**  
**(Medium and Light Loading Areas)**

Mounting Surfaces	Type of Protector Being Used	Number of Drops	First Attachment		Intermediate Attachments	Last Attachment
			Angle Between Drop and Wall			
			Less than 30°	30° and Over		
Wood, Stucco on Wood, or Metallic Siding on Wood	Fused	1 or 2	S Knob for one drop. T Knob for two drops.	S Knob with 5/16-in. Angle Screw for one drop or T Knob with 3/8-in. Angle Screw for two drops.	5/8-in. Insulated Screw Eyes on wood and metallic siding or 5/8-in. L Insulated Screw Eyes on stucco.	C Knob for each two drops.
		3 or More	T Knob for each two drops.	T Knob with 3/8-in. Angle Screw for two drops.		
	Fuseless	1 or 2	Drop Wire Hook.	Drop Wire Hook.	5/8-in. Drive Rings or E Bridle Rings.	E Drop Wire Clamp or No. 4 Cable Clamp.
		3 or More	Drop Wire Hook for each two drops.	Drop Wire Hook for each two drops.		
Masonry, Solid Brick, or Substantial Brick Veneer	Fused or Fuseless	1 or 2	Drop Wire Hook.	Drop Wire Hook.	5/8-in. Drive Rings or E Bridle Rings.	E Drop Wire Clamp or No. 4 Cable Clamp.
3 or More		Drop Wire Hook for each two drops.	Drop Wire Hook for each two drops.			
Thin-wall Brick Veneer (Less than 3-3/4 in. Thickness)		1 or 2	Drop Wire Hook.* S Knob for each drop.	Drop Wire Hook.* One or two S Knobs with House Bracket.	5/8-in. Drive Rings or E Bridle Rings.	E Drop Wire Clamp or No. 4 Cable Clamp.
		3 or More	Drop Wire Hook* for each two drops or two T Knobs with House Bracket for each four drops.	Drop Wire Hook* for each two drops or two T Knobs with House Bracket for each four drops.		
Hollow Tile		1 or 2	S Knob for one drop. T Knob for two drops.	One or two S Knobs with House Bracket.	Toggle Bridle Rings.	E Drop Wire Clamp or No. 4 Cable Clamp.
		3 or More	T Knob for each two drops.	Two T Knobs with House Bracket for each four drops.		
All Types		1 or More	When necessary to clear a building corner in making first attachment, use an S Knob with Corner Bracket for one drop or a T Knob with Corner Bracket for two drops.			
Steel Structural Framework		1 or 2	The No. 505 Universal Insulator Support may be equipped with one S Knob, or the 506 may be equipped with one T Knob, provided that the support is so placed that it will be pulled against the structural steel member.			

**Note:** On stucco, tile, metal lath, and thin-wall brick veneer buildings, attachments should be made preferably to secure wood trim. Where this is practicable, make attachment as for wood buildings.

\* Use separate Drop Wire Hook for each drop crossing a highway.

**TABLE C**  
**Fasteners for Drop Wire Attachments**

Attachments	Wall Type	Fasteners		Remarks
		Quantity	Type	
Drop Wire Hook	Masonry or Substantial Brick Veneer	1	5/16 in. x 1-3/4 in. Hammer Drive Anchor.	Locate anchor in center of brick.
	Thin-wall Brick Veneer	1	5 in., No. 18 RH Galvanized Wood Screw.	Locate wood screw in center of brick.
	Hollow Tile	1	5/16 in. x 4 in., RH Galvanized Toggle Bolt.	Place 7/16 in. x 2-1/2 in. Galvanized Square Washer between wall and drop wire hook.
	Wood Siding or Shingle, and Metallic Siding on Wood	1	2 in., No. 18 RH Galvanized Wood Screw.	Locate approximately 1-1/2 inches below bottom of shingle or siding.
House Bracket	Exposed Woodwork	3	2 in., No. 14 RH Galvanized Wood Screws.*†	Locate upper screw approximately 1-1/2 inches below bottom of shingle or clapboard.
	Stucco on Wood	3	2-1/2 in., No. 14 RH Galvanized Wood Screws.*	
	Thin-wall Brick Veneer	2	6 in., No. 14 RH Galvanized Wood Screws.	Penetrate wood backing approximately 1 inch.
	Rigid Composition Shingles	3	3 in., No. 14 RH Galvanized Wood Screws.	
Corner Bracket	Masonry or Substantial Brick Veneer	2	1/4 in. x 1-1/4 in. Hammer Drive Anchors.	
	Thin-wall Brick Veneer	2	6 in., No. 14 RH Galvanized Wood Screws.	Penetrate wood backing approximately 1 inch.
	Hollow Tile	2	1/4 in. x 3 in. or 4 in. RH Toggle Bolts.	
	Exposed Woodwork	2	2 in., No. 14 RH Galvanized Wood Screws.*†	If practicable, place all screws in studding.
	Stucco on Wood	2	2-1/2 in., No. 14 RH Galvanized Wood Screws.*	
	Rigid Composition Shingles	2	3 in., No. 14 RH Galvanized Wood Screws.	
S Knob	Exposed Woodwork	1	2-1/2 in., No. 18 FH Galvanized Wood Screw.	Place screw in studding if practicable. When attaching to shingle or clapboard, locate screw approximately 1-1/2 inches below bottom of shingle or clapboard.
	Stucco on Wood	1	3 in., No. 18 FH Galvanized Wood Screw.	Place screw in studding if practicable. Use 3-1/2 in., No. 18 FH Galvanized Wood Screw if necessary to penetrate wood sheathing or studding.

S Knob	Thin-wall Brick Veneer	1	7 in., No. 18 FH Galvanized Wood Screw.	Penetrate wood backing approximately 1 inch.
	Hollow Tile	1	5/16 in. x 5 in., RH Galvanized Toggle Bolt.	Place flat side of S Knob against bolthead.
	Rigid Composition Shingles	1	3-1/2 in., No. 18 FH Galvanized Wood Screw.	
T Knob	Exposed Woodwork	1	3-1/2 in., No. 18 FH Galvanized Wood Screw.	Place screw in studding if practicable. When attaching to shingle or clapboard, locate screw approximately 1-1/2 inches below bottom of shingle or clapboard.
	Stucco on Wood	1	3-1/2 in., No. 18 FH Galvanized Wood Screw.	Place screw in studding if practicable. Use 4-1/2 in., No. 18 FH Galvanized Wood Screw if necessary to penetrate wood sheathing or studding.
	Thin-wall Brick Veneer	1	7 in., No. 18 FH Galvanized Wood Screw.	Pass screw through the seam between bricks. Penetrate wood backing approximately 1 inch.
	Hollow Tile	1	5/16 in. x 6 in., FH Galvanized Toggle Bolt.	
	Rigid Composition Shingles	1	4-1/2 in., No. 18 FH Galvanized Wood Screw.	
C Knob	Exposed Woodwork (Outdoors)	1	2-1/2 in., No. 10 RH Galvanized Wood Screw.	Locate screw approximately 1 inch above bottom of shingle or clapboard.
	Exposed Woodwork (Indoors)	1	2 in., No. 8 RH Blued Wood Screw.	
	Stucco on Wood	1	3 in., No. 10 RH Galvanized Wood Screw.	
E Drop Wire Clamp or No. 4 Cable Clamp	Masonry, Brick Veneer, Hollow Tile	1	5/16 in. x 1 in. Expansion Shield with 1 in., No. 10 RH Galvanized Wood Screw.	
	Wood Siding or Shingle, and Metallic Siding on Wood	1	1 in., No. 10 RH Galvanized Wood Screw.	Locate screw approximately 1 inch above bottom of shingle or clapboard.
Universal Insulator Supports, Nos. 505 and 506	I Beams, Angle Irons, etc			May be equipped with an S or T Knob, respectively. In attaching the support to a steel member, tighten the setscrew securely.
Drive Rings	5/8 in. and 7/8 in.	1	1/4 in. x 1 in. Hammer Drive Anchor.	
	5/8 in. L 7/8 in. L 1-1/4 in. L 1-1/4 in. L	1	1/4 in. x 1-1/2 in. Hammer Drive Anchor.	
Bridle Rings A, C, and E	Masonry or Substantial Brick Veneer	1	1 in. No. 10-14 Wood Screw Anchor.	

\* If necessary, use 3 inch, No. 14 RH Galvanized Wood Screws to penetrate studding.

† Use 1-1/2 inch, No. 14 RH Galvanized Wood Screws where attached to solid timbers.

**TABLE D**  
**Equipping Drop Wire Attachments with S and T Knobs**

Attachments		Equipped with		Use	Remarks
		S Knob	T Knob		
Angle Screw	5/16 in.	1		Nut furnished.	Place flat side of knob against beveled side of nut.
	3/8 in.		1		
House Bracket		1		5/16 in. x 2 in., FH Galvanized Stove Bolt.	Place flat side of first knob against house bracket. Place flat side of second knob against beveled side of nut.
		2*		5/16 in. x 3 in., FH Galvanized Stove Bolt.	
			1	3/8 in. x 3 in. Galvanized Machine Bolt.	Place flat side of first knob against bolthead. Place flat side of second knob against nut.
			2*	3/8 in. x 5 in. Galvanized Machine Bolt.	
Corner Bracket		1		5/16 in. x 2 in., FH Galvanized Stove Bolt.	Place flat side of knob against corner bracket.
		2*		5/16 in. x 3 in., FH Galvanized Stove Bolt.	Place flat side of top knob against bolthead and place nut against flat side of lower knob.
			1	3/8 in. x 3 in. Galvanized Machine Bolt.	Place flat side of T Knob against bolthead.
Universal Insulator Support	No. 505	1		5/16 in. x 2 in., FH Galvanized Stove Bolt.	Place flat side of knob against beveled side of nut. May be equipped with a Drop Wire Hook by means of a 5/16 in. x 1 in., FH or RH Galvanized Steel Bolt obtained locally.
	No. 506		1	3/8 in. x 3 in. Galvanized Machine Bolt.	

\* Locate one knob above and one knob below bracket.

3.05 Table E indicates the drop and block wire capacity of drive rings, bridle rings, and insulated screw eyes.

TABLE E

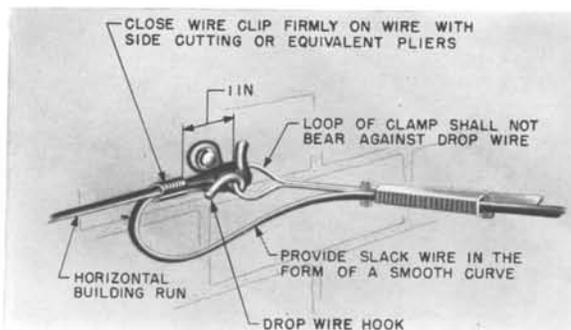
Drop and Block Wire Capacity  
Drive Rings, Bridle Rings, and Insulated Screw Eyes

Size and Type of Ring or Insulated Screw Eye	Maximum No. of Wires		
	NP or C Drop Wire	HD Wire	Block Wire
5/8 in. and 5/8 in. L* Drive Rings	6	4	9
7/8 in. and 7/8 in. L* Drive Rings	16	11	22
1-1/4 in. and 1-1/4 in. L* Drive Rings	30	18	40
E Bridle Ring	6	4	9
C or M Bridle Ring	16	11	22
A Bridle Ring	30	18 </td <td>40</td>	40
5/8 in. S and L* Insulated Screw Eyes	4	3	7
1 in. S and L* Insulated Screw Eyes	10	6	16

\* The L type is equipped with longer shank.

#### 4.00 METHODS OF ATTACHING DROP AND BLOCK WIRES ON BUILDINGS

4.01 Typical First Attachments on Buildings are shown in Figs. 1 through 8.



Note: When a second drop wire hook is required, attach it as close as possible to the first hook. On brick buildings do not place second hook on the same brick.

FIG. 1—FIRST ATTACHMENT—DROP WIRE HOOK

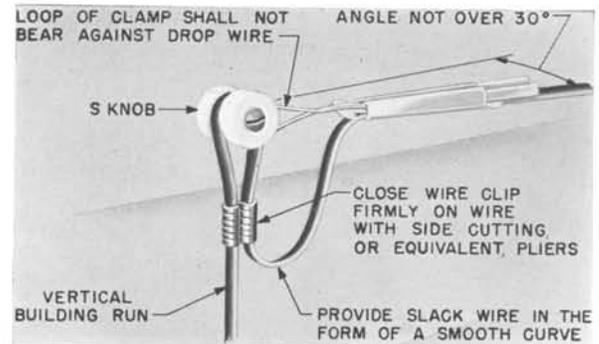


FIG. 2—FIRST ATTACHMENT—S KNOB

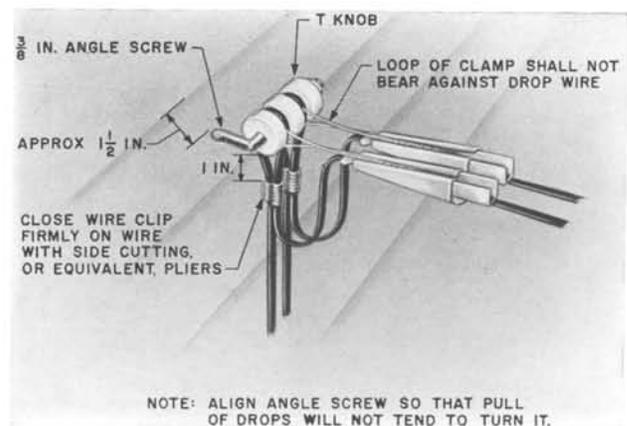
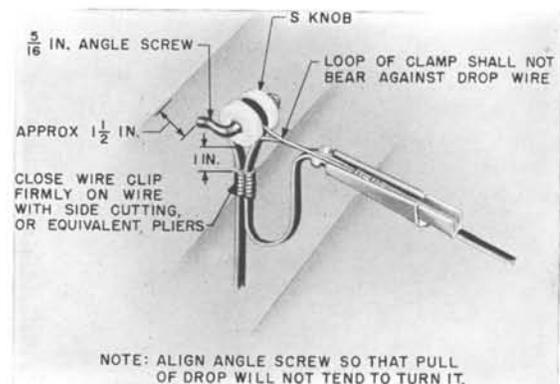


FIG. 3—FIRST ATTACHMENT—ANGLE SCREW (DROP WIRE RUN IN VERTICAL DIRECTION ON BUILDING)

SECTION C23.011

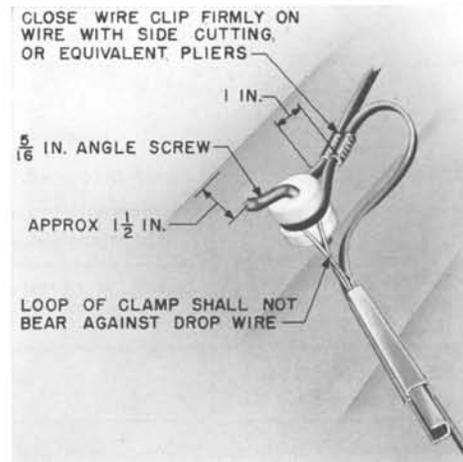
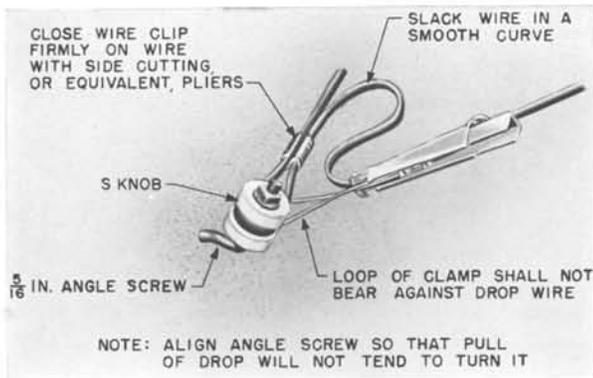


FIG. 4—FIRST ATTACHMENT—ANGLE SCREW (DROP WIRE RUN IN HORIZONTAL DIRECTION ON BUILDING)

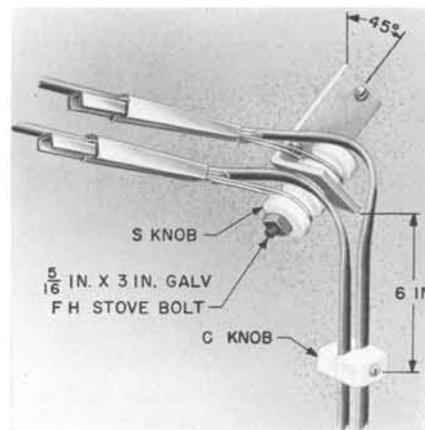
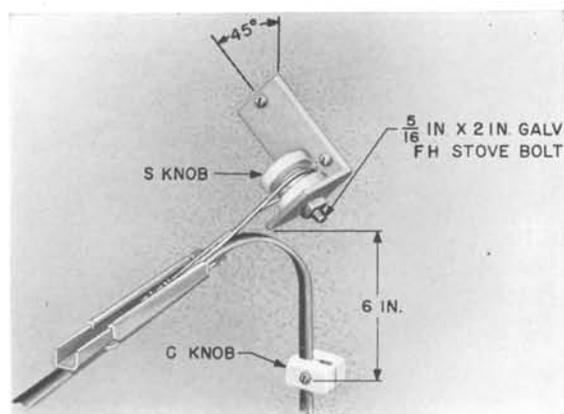
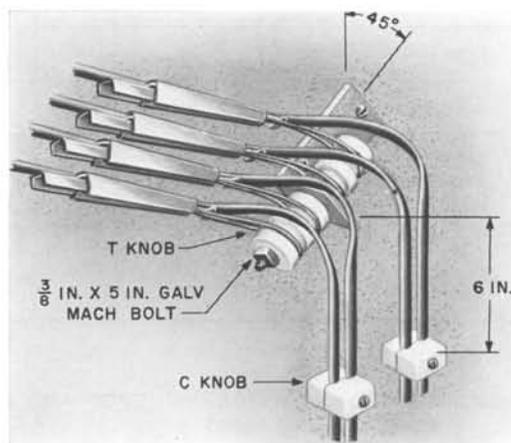
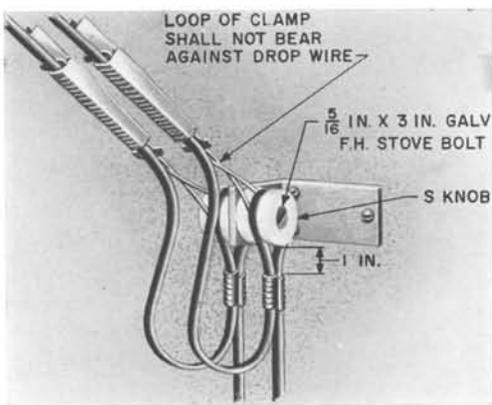


FIG. 5—FIRST ATTACHMENT—HOUSE BRACKET (DROP WIRE RUN IN VERTICAL DIRECTION ON BUILDING)

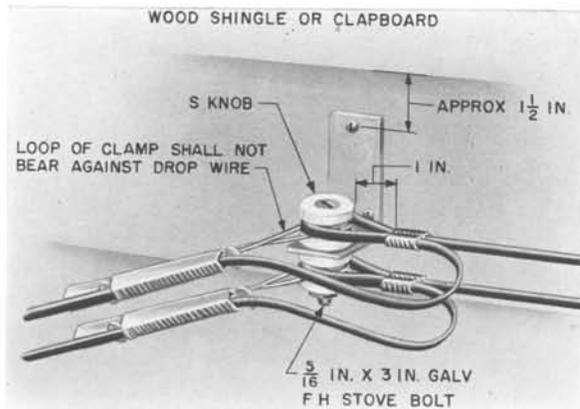


FIG. 6—FIRST ATTACHMENT—HOUSE BRACKET  
(DROP WIRE RUN IN HORIZONTAL DIRECTION ON BUILDING)

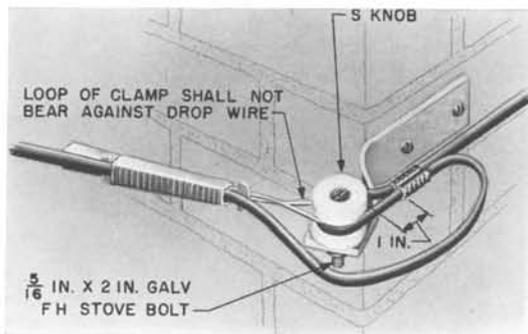


FIG. 7—FIRST ATTACHMENT—CORNER BRACKET

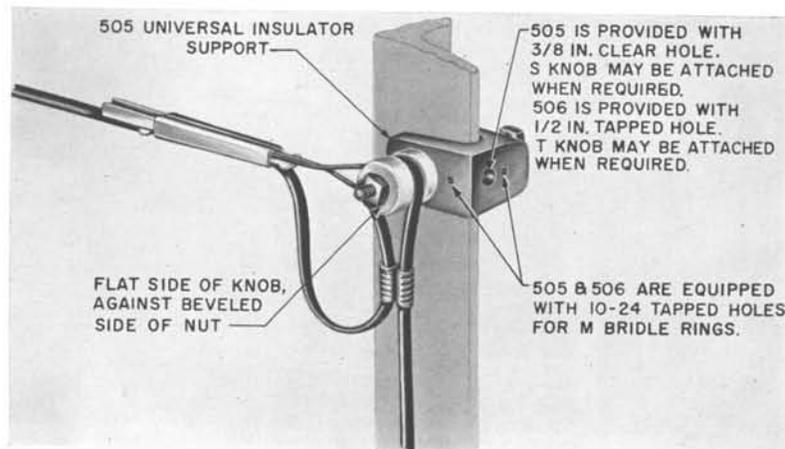


FIG. 8—FIRST ATTACHMENT—NO. 505 OR 506 UNIVERSAL INSULATOR SUPPORT

4.02 The Nos. 505 and 506 Universal insulator supports may be used as first attachments for drop and block wires on structural steel framework, provided that the support is so placed that it will be pulled against the structural steel member (see Fig. 8). The setscrew should be securely tightened.

4.03 The additional 3/8-inch clear hole and 1/2-inch tapped hole provided on the end of the Nos. 505 and 506 Universal insulator supports, respectively, may be used only when the supports are used as intermediate attachments.

4.04 **Intermediate Attachments on Buildings** should be spaced in accordance with the following:

- Drop wire attachments should be spaced 9 feet apart or less on horizontal runs and 12 feet apart or less on vertical runs.
- Block wire attachments should be spaced 4 feet apart or less on horizontal runs and 8 feet apart or less on vertical runs.
- Attachments should be evenly spaced.

SECTION C23.011

4.05 Intermediate Attachments at Building Corners are shown in Figs. 9 and 10.

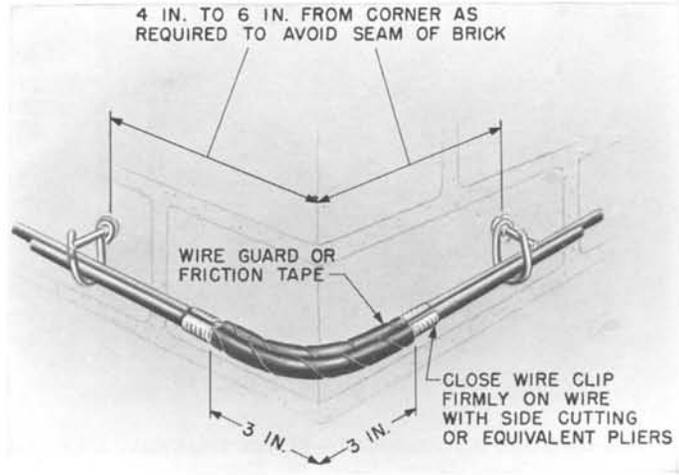
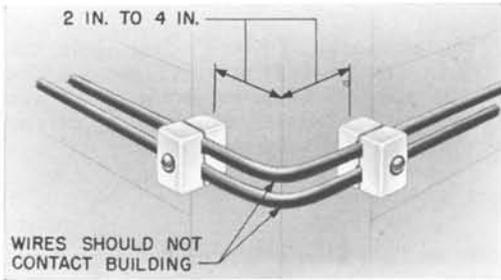


FIG. 9—INTERMEDIATE BUILDING ATTACHMENTS AT OUTSIDE CORNERS

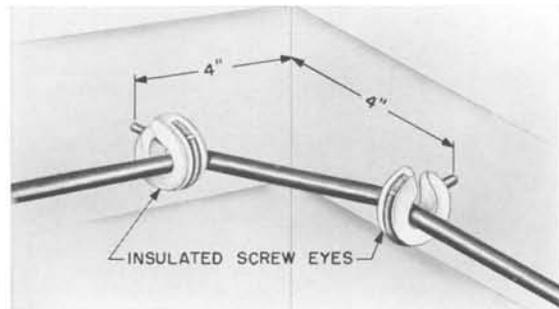
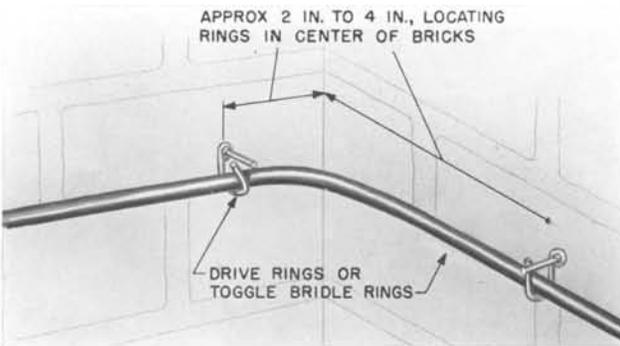


FIG. 10—INTERMEDIATE BUILDING ATTACHMENTS AT INSIDE CORNERS

4.06 Intermediate Attachments to Change Direction of Wire Runs are shown in Fig. 11.

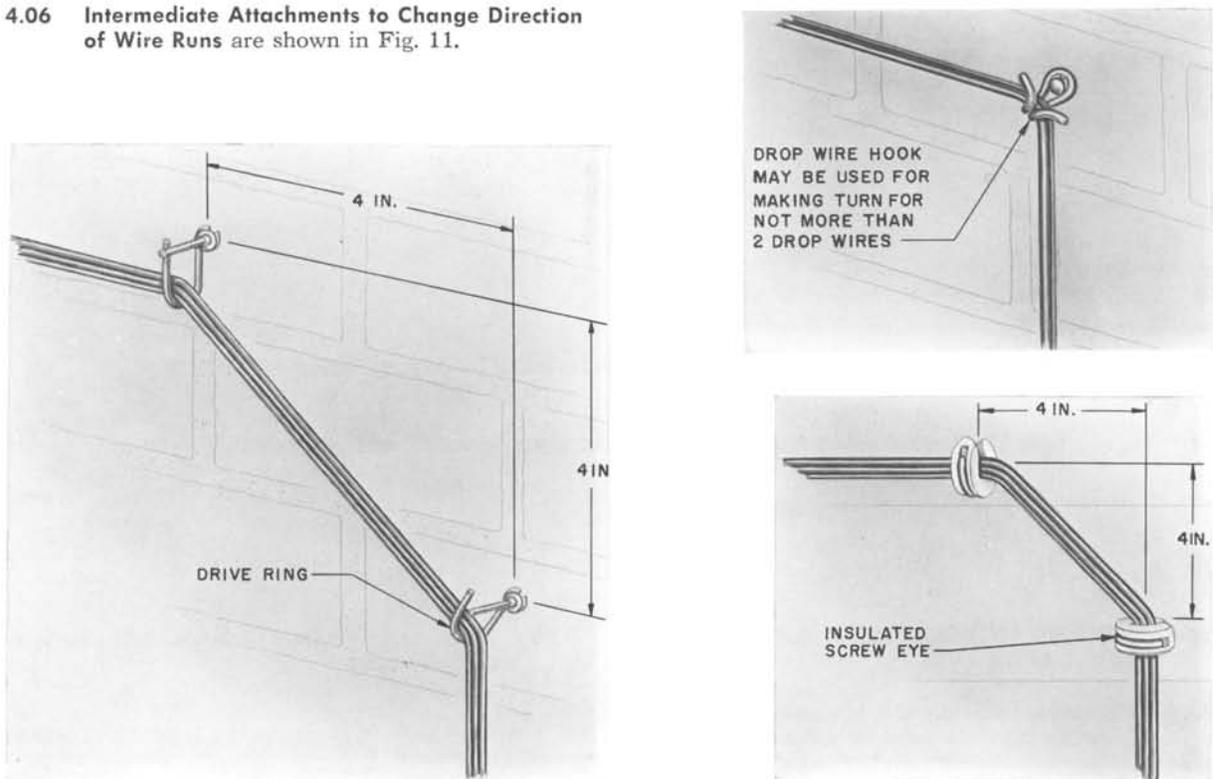


FIG. 11—INTERMEDIATE BUILDING ATTACHMENTS TO CHANGE DIRECTION OF WIRE RUN

4.07 Last Attachments on Buildings are shown in Figs. 12 and 13. The last attachment should be located within 18 inches of the building entrance hole.

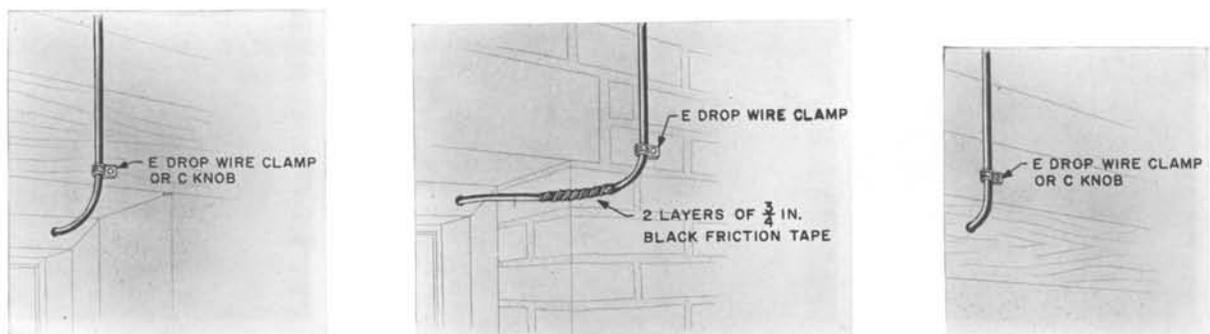
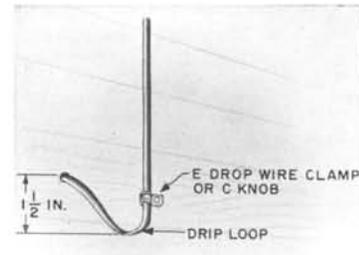
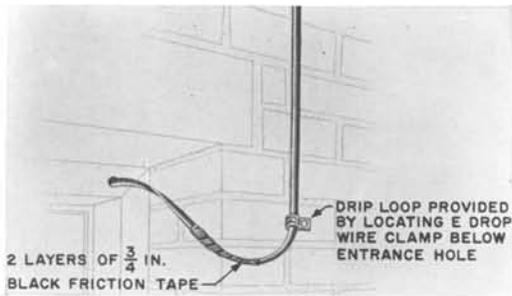


FIG. 12—LAST ATTACHMENT (BUILDING ENTRANCE HOLE SLOPES UPWARD FROM OUTSIDE)



**Note:** Where possible, the last attachment should be located below the building entrance hole.

FIG. 13—LAST ATTACHMENT (BUILDING ENTRANCE HOLE DOES NOT SLOPE UPWARD FROM OUTSIDE)

**5.00 BUILDING ENTRANCE HOLES FOR DROP AND BLOCK WIRES**

**5.01** Plastic or porcelain tubes are required at building entrance holes only if there is a possibility of severe abrasion and/or where fused protection is required and the wire passes through a flammable surface. Place tube as shown in Fig. 14. Cut porcelain tubes with a tube cutter and cut plastic tubes with a hack saw or diagonal pliers. Split tubes should not be used at entrance holes.

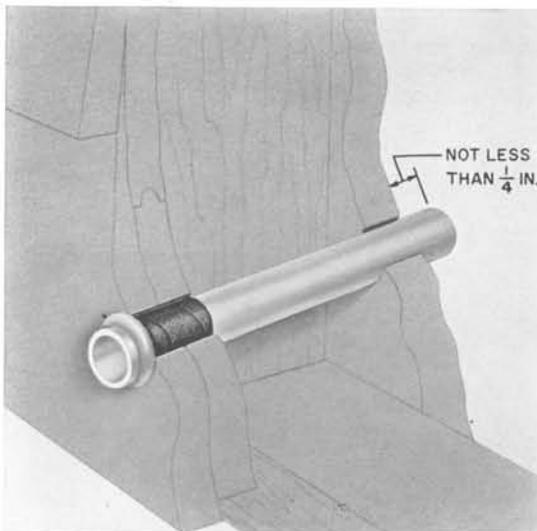


FIG. 14—PLACING TUBE

**5.02** When drilling building entrance holes, consider the following:

- Drill holes from side where appearance is most important.
- Slope holes upward from outside.
- Use seams when drilling through masonry.
- Exercise care to avoid splintering wood or cracking masonry or brick.

**5.03** Sizes of building entrance holes for wires and plastic tubes are shown in Table F.

**6.00 METHODS OF FASTENING DROP AND BLOCK WIRES INSIDE OF BUILDINGS**

**6.01** Drop or block wire runs between the point of entrance and the station protector should be kept as short as practicable.

**6.02** Methods of fastening drop and block wires at exposed stations between the point of entrance and the protector are shown in Fig. 15.

TABLE F  
 Sizes of Building Entrance Holes  
 For Drop and Block Wires and Plastic Tubes

Type of Wire	Number of Wires							
	Plastic Tube Required				No Tube Required			
	Tube Size, Inches				Hole Size, Inches			
	3/8	1/2	5/8	3/4				
	Hole Size, Inches				3/8	1/2	5/8	3/4
	1/2	5/8	3/4	1-1/4				
B Block (Bridle)	2	3	4	5	2	3	4	5
C or NP Drop	1	2	3	4	1	2	3	4
HD Drop		1	2	2		1	2	2

Note: When porcelain tubes are used, the size of the hole must be increased.

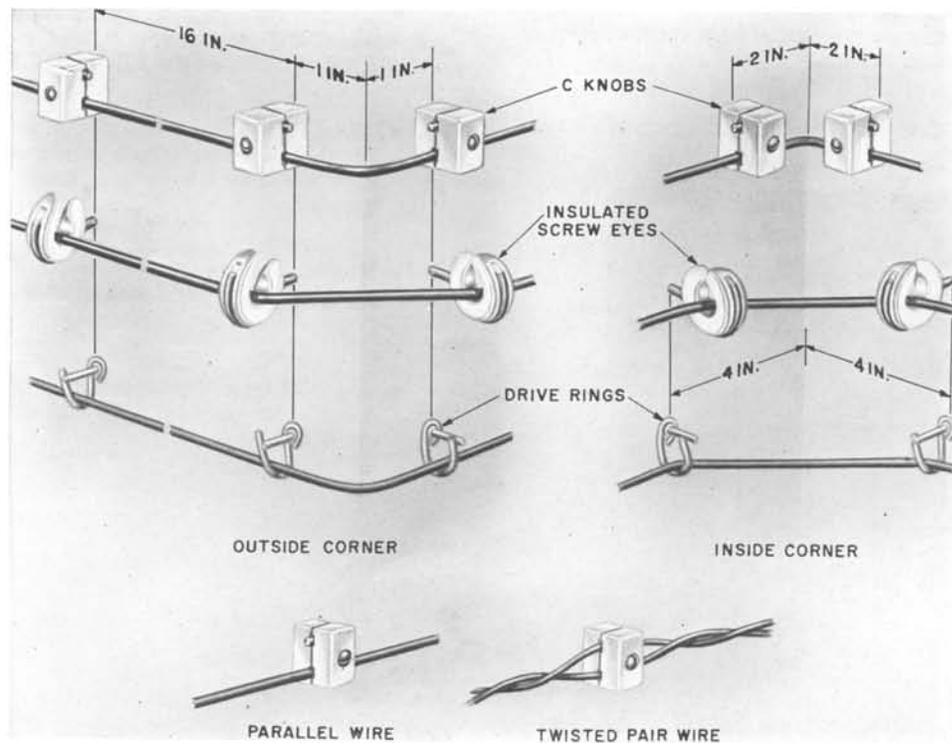


FIG. 15—FASTENING DROP AND BLOCK WIRE INSIDE OF BUILDINGS

## SECTION C23.011

6.03 At unexposed stations the methods of fastening drop and block wires between the point of entrance and the connecting block or subset are the same as for fastening station wire.

### 7.00 FASTENERS FOR STATION WIRE AND CABLE

7.01 When selecting station wire and cable fasteners:

- Use galvanized fasteners outdoors or where appearance is unimportant.
- Choose fastener color to match color of wire or cable.

7.02 A Cable Clamp and a Cable Clasp are shown in Fig. 16. Table G indicates the fasteners to be used to attach cable clamps and cable clasps to various surfaces.

- Cable clamps and cable clasps are used for fastening cable or more than one station wire.
- Cable clamps are available in brown, ivory, or galvanized finish.
- Cable clasps are available in brown or ivory.

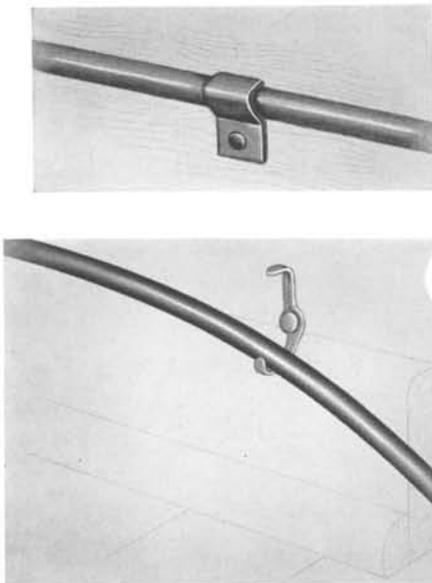


FIG. 16—CABLE CLAMP AND CABLE CLASP

7.03 The B Station Wiring Clamp is shown in Fig. 17. Table H indicates the fasteners to be used to attach B station wiring clamps to various surfaces.

- The B station wiring clamps are used for fastening jacketed wire.
- They are available in brown, ivory, or galvanized finish.



FIG. 17—B STATION WIRING CLAMP

7.04 The LP-, M-, or TM-Type Staple is shown in Fig. 18.

- All of these staples are used for fastening jacketed wire.
- The LP-type staples are available in brown or ivory and are driven with the Model T-2 Heller stapler or the ES-766315 hand stapler.
- The LP-type staples do not in general possess adequate holding power in plaster walls, and their use in such instances should therefore be avoided.
- The M-type staples are available in brown or ivory and are driven with the Model M Heller stapler.
- The TM-type staples are available in copper oxide color and are driven with TM-type stapler.

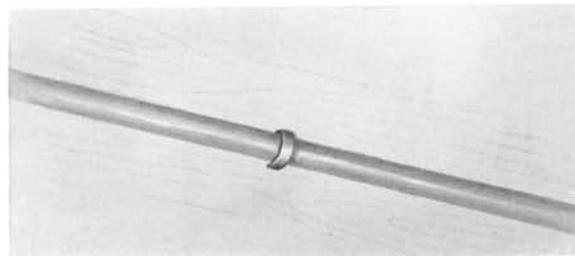


FIG. 18—LP-, M-, OR TM-TYPE STAPLE

**TABLE G**  
Fasteners for Cable Clamps and Cable Clasps

Surface	Type		Fastener	Remarks
	Clamp	Clasp		
Woodwork	Nos. 3 and 5	No. 7	1-1/2 in., No. 6 RH Blued Wood Screw or 1/2 in. Inside Wiring Nail in Hardwood or 7/8 in. Inside Wiring Nail in Softwood.	No. 8 RH Blued Wood Screws cannot be used without reaming the screw hole.
Woodwork, Plaster on Wood Lath, or Plasterboard	Nos. 6, 7, 8, 10, 12, 13, and 17	Nos. 9 and 14	1-1/2 in., No. 8 RH Blued Wood Screw.*	Inside wiring nail may be used to attach No. 9 clasp to wood.
Plaster on Wood or Metal Lath, Plasterboard, or Metal Sheathing	Nos. 3 and 5	No. 7	7/8 in. Inside Wiring Nail or 3/8 in. or 5/8 in. No. 6 Self-tapping Screw in metal.	Place fasteners at stud locations or in solid wood backing.
Metal Sheathing	Nos. 6, 7, 8, 10, 12, 13, and 17	Nos. 9 and 14	3/8 in. or 5/8 in. No. 8 Self-tapping Screw in metal or 1 in. Roofing Nail.	No. 8 RH Blued Wood Screws cannot be used without reaming the screw hole. No. 6-D Slating Nail may be used to attach Nos. 9 and 14 clasps to studding if baseboard is not wood.
Plaster on Masonry or Plaster Block	Nos. 3 and 5	No. 7	1-1/2 in., No. 6 RH Blued Wood Screw in 1-1/2 in. No. 6-8 Screw Anchor.	
	Nos. 6, 7, 8, 10, 12, 13, and 17	Nos. 9 and 14	2 in., No. 8 RH Blued Wood Screw* in 1-1/2 in. No. 6-8 Screw Anchor.	
Masonry	Nos. 3 and 5	No. 7	1 in., No. 6 RH Blued Wood Screw in 3/4 in. No. 6-8 Screw Anchor.	No. 8 RH Blued Wood Screws cannot be used without reaming the screw hole.
	Nos. 6, 7, 8, 10, 12, 13, and 17	Nos. 9 and 14	1 in., No. 8 RH Blued Wood Screw* in 3/4 in. No. 6-8 Screw Anchor.	A 3/16 in. x 7/8 in. Hammer Drive Anchor may be used with Nos. 6, 7, 8, and 10 cable clamps.

\* Use galvanized screws for galvanized clamps. For Nos. 13 and 17 clamps use No. 10 RH Galvanized Wood Screws and No. 10-14 Screw Anchors.

† Washers are required under the head of the screw when Nos. 13 and 17 cable clamps are used.

**TABLE H**  
Fasteners for B Station Wiring Clamp

Surface	Fastener
Metal or Asbestos Siding	5/8 in. No. 6 Self-tapping Screw.
Wood (Indoors)	5/8 in., No. 6 RH Blued Wood Screw or Inside Wiring Nail.
Wood (Outdoors)	5/8 in., No. 6 RH Galvanized Wood Screw.

SECTION C23.011

7.05 Inside Wiring Nails are shown in Fig. 19.

- Inside wiring nails are used generally to fasten GS-type and other types of twisted wire.
- They are available in brown or ivory.
- They are available in 1/2- and 7/8-inch sizes (use nail of sufficient length to fasten wire securely).

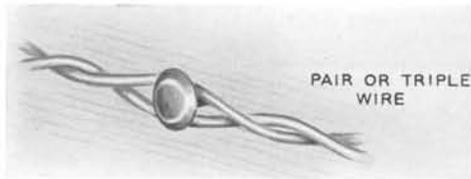


FIG. 19—INSIDE WIRING NAILS

7.06 Inside Wiring Cleats are shown in Fig. 20.

- Inside wiring cleats are used on surfaces where staples or inside wiring nails cannot be placed securely.
- They are fastened with a No. 8 RH blued wood screw of sufficient length to mount securely.

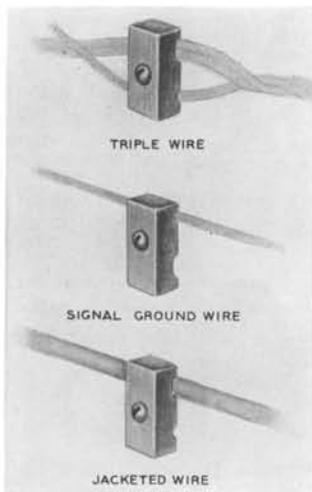


FIG. 20—INSIDE WIRING CLEATS

7.07 The No. 509 Universal Insulator Support is shown in Fig. 21.

- This support is used to fasten station wire and cable on metal structures.
- It may be equipped with M bridle rings.

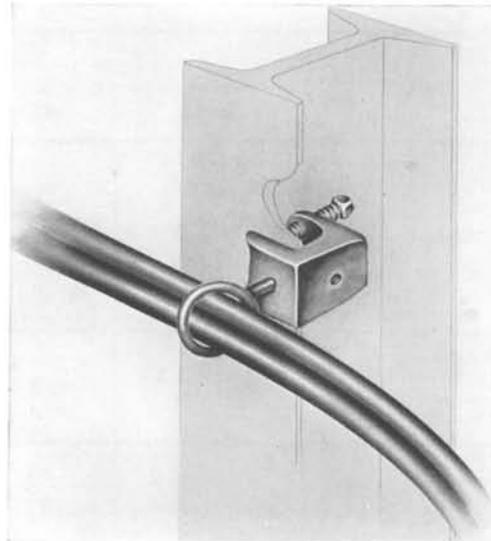


FIG. 21—NO. 509 UNIVERSAL INSULATOR SUPPORT

7.08 Drive Rings are shown in Fig. 22.

- Install rings on brick or masonry surfaces with hammer drive anchor as indicated in Table C.

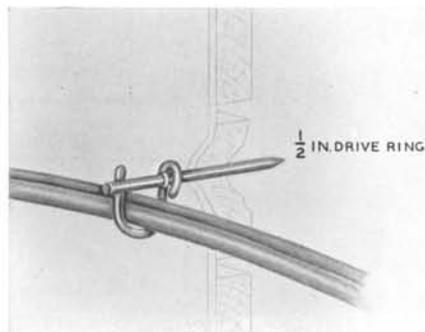
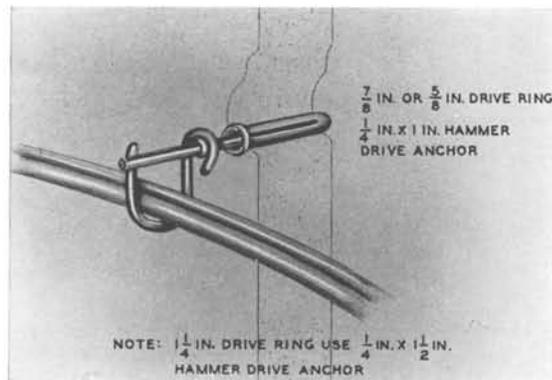


FIG. 22—DRIVE RINGS

7.09 The Bridle Ring and Toggle Bridle Ring are shown in Fig. 23.

- Toggle bridle rings are used to fasten station wire and cable to hollow surfaces.
- Bridle rings are installed on brick or masonry surface with wood screw anchors as indicated in Table C.

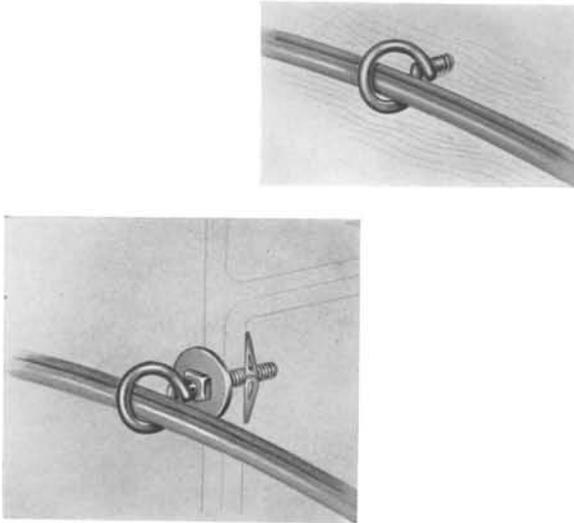


FIG. 23—BRIDLE RING AND TOGGLE BRIDLE RING

7.10 The B Adhesive Clip is shown in Fig. 24.

- The B adhesive clip is used to fasten station wiring where it is undesirable to mar surfaces.
- Best adhesion is obtained on a clean, smooth surface.
- High temperatures may deteriorate B adhesive clips during storage; therefore, those not used before date on container should be tested for tackiness.
- Install B adhesive clip as follows:
  1. Thoroughly moisten adhesive surface with trichloroethylene.
  2. Allow sufficient time for adhesive to become tacky.
  3. Press clip to bonding surface for about 5 seconds.
  4. Allow clip to set for 15 minutes.
  5. Place station wire in clip and form tabs over wire.

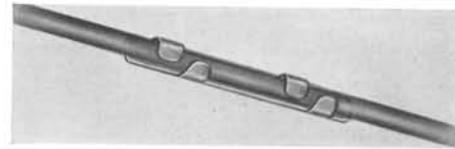


FIG. 24—B ADHESIVE CLIP

7.11 Capacity of Fasteners for station wire and cable is indicated in Tables J and K.

TABLE J  
Capacity of Fasteners for Station Wire

Type of Wire		Capacity of Cable Clamps					Capacity of Cable Clasp		Capacity of 1/2-in. Drive Rings
		No. 5	No. 6	No. 7	No. 8	No. 10	No. 7	No. 9	
JK (Jacketed)	Paired	3	4	5	6	6	2	4	6
	Triple	2	3	4	5	6	2	3	5
	Quad		3	3	4	5	2	3	5
GS	Paired	4	6	8	9	10	3	6	10
	Triple	3	4	5	6	7	2	4	7
	Quad		3	4	4	5	2	3	5
B Block	Paired			3	4	5			4
	Triple				3	4			3

**TABLE K**  
**Capacity of Fasteners for Cable**

Size of Cable Pair	Clamps, No.		Clasps, No.
	Galvanized Cable Clamps For Lead-covered Cable	Brown or Ivory	Brown or Ivory
4		5	7
6	6	5	7
11	7	6	7
12		6	7
16	8	8	9
21	10	8	9
26	10	8	9
31	10		
41	13		
51	13	12	14
76	13	12	14
101	17	12	14

**7.12 Spacing of Fasteners** for station wire and cable is indicated in Table L. Where appearance is not a controlling factor, the spacing between the fasteners may be increased.

**TABLE L**  
**Spacing of Fasteners for Station Wiring and Cable**

Fasteners		Spacing				
		Horizontal Run		Vertical Run		From Corner
		Inches	Feet	Inches	Feet	Inches
Cable Clamps	More Than 12-Pair Cable	16			4	2
	Less Than 12-Pair Cable	16		16		2
Cable Clasps	More Than 12-Pair Cable	14			3	2
	Less Than 12-Pair Cable	14		14		2
B Adhesive Clips		12		12		2
B Station Wiring Clamps		16		16		2
Inside Wiring Nails		16		16		2
Inside Wiring Cleats		16		16		2
Staples		7-1/2		7-1/2		1
Bridle Rings			4		8	2 to 8-1/2, incl*
Drive Rings			4		8	2 to 8-1/2, incl*
Toggle Bridle Rings			4		8	2 to 8-1/2, incl*
Universal Insulator Supports			4		8	2 to 8-1/2, incl*

\*When changing direction of wire or cable runs where bridle rings, drive rings, toggle bridle rings, and Universal insulator supports are used, the fasteners should be spaced to hold the wire or cable at approximately a 45-degree angle.

**TABLE M**  
**Sizes of Holes**  
**For Station Wire**

Type of Wire		Wire Hole Sizes, Inches							
		Number of Wires							
		1		2		3		4	
		Not Taped	Taped*	Not Taped	Taped*	Not Taped	Taped*	Not Taped	Taped*
JK (Jacketed)	Paired	1/4	3/8	3/8	1/2	3/8	1/2	1/2	5/8
	Triple	1/4	3/8	3/8	1/2	1/2	5/8	1/2	5/8
	Quad	1/4	3/8	3/8	1/2	1/2	5/8	1/2	5/8
GS	Paired	1/4	3/8	5/16	1/2	3/8	1/2	3/8	1/2
	Triple	1/4	3/8	3/8	1/2	3/8	1/2	1/2	5/8
	Quad	1/4	3/8	3/8	1/2	1/2	5/8	1/2	5/8
B (Block)	Paired	5/16	3/8	1/2	1/2	5/8	5/8	5/8	5/8
	Triple	5/16	1/2	5/8	5/8	5/8	3/4	3/4	3/4

\*Two layers of friction tape.

**TABLE N**  
**Sizes of Holes**  
**For Station Cable**

No. of Pairs	Cable Hole Sizes, Inches		
	BUA or OUA	Inside Wiring	
		Not Taped	Taped*
4		5/16	1/2
6	3/8	5/16	1/2
11	1/2	3/8	5/8
12		3/8	5/8
16	5/8	3/8	5/8
21	5/8	5/8	3/4
26	5/8	5/8	3/4
31	3/4		
41	3/4	3/4	7/8
51	7/8	3/4	7/8
76	1	7/8	1
101	1-1/8	1	1-1/8

\*Two layers of friction tape.

### 8.00 SIZES OF HOLES FOR STATION WIRE AND CABLE

Tables M and N indicate the size of hole needed to accommodate various types and numbers of station wires and cables.

**9.00 FASTENERS FOR GROUND WIRE**

**9.01** Fasteners for ground wire and their use are shown in Fig. 25.

**9.02** Ground wire fasteners should be spaced and placed as follows:

- Space 24 inches apart on ordinary ground wire runs.
- Space 16 inches apart when wire is subject to displacement.
- Place on every beam when spanning beams.
- Place within 3 inches of wall when run parallel to wall on beams.

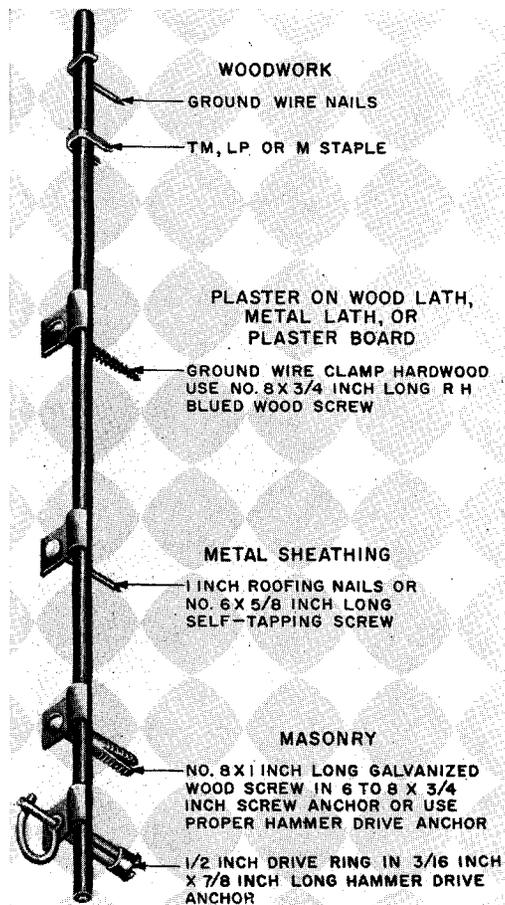


FIG. 25—FASTENERS FOR GROUND WIRE