

DROP AND BLOCK WIRING

FASTENING AND EQUIPPING INTERMEDIATE AND LAST ATTACHMENTS OF DROP AND BLOCK WIRE RUNS ON BUILDINGS

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1. GENERAL

1.01 This section specifies:

- The rules to be followed in planning drop and block wire runs on buildings.
- The methods of fastening and equipping intermediate and last attachments.

- The methods of running drop and block wire on building walls and structures.
 - The methods of running drop and block wire inside buildings.
- 1.02 This section is reissued to include methods of fastening intermediate and last attachments to aluminum and vinyl siding.
- 1.03 The attachments to be used in any installation depend on a number of factors, such as:
- Loading areas
 - Number of drops to be placed
 - Type of surface to be attached to
 - Insulated or noninsulated attachments.
- 1.04 See Section 462-350-212 for drop wire attachments used on all types of walls in heavy loading areas.
- 1.05 Section 462-350-211 describes drop wire attachments for use on all types of walls in medium and light loading areas.
- 1.06 Section 460-100-100 covers the use of insulated or noninsulated attachments.
- 1.07 To assure all attachments are secure and to avoid damage to building surfaces, it is essential that the specific instructions covered in Section 080-720-105 is followed. Of particular importance are the clearance and lead holes for fasteners.
- 1.08 Where bare aluminum is exposed by drilling or cutting, apply a coating of KS-14681 L1 antirust compound to prevent corrosive action.

NOTICE

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SECTION 462-350-214

1.09 Plan the wire run so the point of entrance and the location of the station protectors will conform to the rules covered in Section 460-100-200.

1.10 Do not use block wire as any part of the connection between exposed plant and the protectors, except when used as bridle fuse wire where stations are served from open wire, C rural wire or 19-gauge multiple line wire. Block wire may be used on the station side of protector.

Warning: *It is possible for foreign voltage to be present on buildings covered with metal siding. Test siding with B voltage tester before starting any work.*

2. RULES

2.01 In planning drop and block wire runs on buildings, observe the following:

- Locate the drop or block wire run on the building with a view to permanency, accessibility, and appearance.
- Locate runs preferably on the rear and side walls of a building.
- Locate the run to require the minimum length of wire and as few turns as practicable. Keep runs horizontal or vertical.
- Locate horizontal runs above the reach of the public.
- Locate vertical runs preferably in the angle formed by intersecting walls if this would not increase the length of the run appreciably.
- Locate the run to avoid power wires and so that it will encounter a minimum number of other obstructions.

- Avoid runs on tin, sheet metal, or other materials requiring frequent repairs or renewals.

- Avoid locating runs on walls which are likely to be added to or on intermediate structures of a deteriorated or temporary construction. Select alternate route.

- Avoid vertical runs within 2 feet of a downspout where severe ice conditions are likely.

- Do not make attachments to chimneys.

- Where building walls are finished with stucco, rigid composition shingles, thin-wall brick veneer, and similar materials, attachments should be located on wood trim if the trim is sufficiently substantial to provide adequate support.

2.02 Reuse an existing block wire at a reinstallation wherever practicable. Inspect the wire carefully and if necessary:

- (1) Tighten all loose rings and replace missing rings.
- (2) Remove excess slack in run.
- (3) Place mechanical protection where necessary around leaders, electrical conduits, and other obstructions.
- (4) If the insulation is weatherworn to such an extent as to indicate that the service is likely to be impaired in the near future, replace the portion which would be likely to introduce trouble.
- (5) Remove strings or other foreign matter which may detract from wire run appearance.

3. SPACING OF ATTACHMENTS

3.01 Space drop wire attachments 9 feet apart or less on horizontal runs and 12 feet apart or less on vertical runs.

3.02 Space block wire attachments 4 feet apart or less on horizontal runs and 8 feet apart or less on vertical runs.

3.03 Locate attachments so that the fasteners will not be placed closer than 10 inches to the corner or the top of a wall, except in turning corners.

3.04 Place additional attachments as required to prevent exposed wires terminated at fused-type protectors from touching flammable surfaces.

3.05 Where windows are available for making attachments on vertical runs, place an attachment at each floor.

3.06 When establishing a wire run on a building wall where cable has been placed, the wire run should, in general, parallel the cable run.

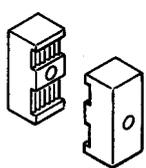
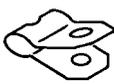
(a) When paralleling cable is attached to a building wall by cable clamps, place rings in every third cable clamp where clamps are 16 inches apart and in every other cable clamp where clamps are 24 inches apart.

(b) When paralleling cable is placed on strand, place separate cable rings for block wires and space them at double the spacing of the cable rings.

4. WIRE CARRYING CAPACITIES OF DRIVE RINGS, WIRE LOOPS, BRIDLE RINGS, AND INSULATED SCREW EYES

4.01 Table A indicates the drop and block wire attachments and fastener to be used on various types of walls.

TABLE A
FASTENERS FOR INTERMEDIATE ATTACHMENTS ON DROP AND BLOCK WIRE

ATTACHMENT		ILLUSTRATION	FASTENER			TYPE OF CONSTRUCTION		REMARKS
			QUANTITY	TYPE				
C WIRE LOOPS	NO. 1/2 NO. 5/8 NO. 7/8 NO. 1-1/4		1	B MASONRY FASTENER	NO. 3	CONCRETE		FASTENERS FOR HAND-TYPE DRIVE TOOLS
			NO. 4		MOTAR			
			NO. 5		CEMENT CINDER	BLOCK		
DRIVE RINGS	1/2 IN.		1	3/16 IN. X 5/8 IN. D DRIVE ANCHOR	MASONRY OR SUBSTANTIAL BRICK VENEER			
	5/8 IN. AND 7/8 IN.		1					1/4 IN. X 1 IN. D DRIVE ANCHOR
	5/8 IN. L* 7/8 IN. L* 1-1/4 IN. 1-1/4 IN. L*		1					1/4 IN. X 1 IN. D DRIVE ANCHOR
C BRIDLE RINGS	7/8 IN.		1	NO. 12 D PLASTIC ANCHOR		MASONRY OR SUBSTANTIAL BRICK VENEER		
	1-1/4 IN. 1-5/8 IN.		1	NO. 16 D PLASTIC ANCHOR				
	3 IN.							
B BRIDLE RINGS			1	B SUPPORT CLIP INSULATOR SUPPORT		ANGLE IRON, I BEAMS, ETC.		
K OR M BRIDLE RINGS			1					
DROP WIRE HOOK		1	5/16 IN. X 1-3/4 IN. HAMMER DRIVE ANCHOR		MASONRY OR SUBSTANTIAL BRICK VENEER			
		1	5/16 IN. X 4 IN. RH GALV TOGGLE BOLT		HOLLOW TILE			
		1	2 IN. NO. 18 RH GALV WOOD SCREWS		WOOD SIDING OR SHINGLE AND METALLIC SIDING ON WOOD		LOCATE APPROX 1-1/2 IN. BELOW BOTTOM OF SHINGLE OR SIDING	
C KNOB (USED ONLY WHERE FUSED PROTECTORS ARE REQUIRED)		1	2-1/2 IN. NO. 10 RH GALV WOOD SCREW		EXPOSED WOODWORK (OUTDOORS)		LOCATE SCREW APPROX 1 IN. ABOVE BOTTOM OF SHINGLE OR CLAPBOARD	
		1	2 IN. NO. 8 RH BLUED WOOD SCREW		EXPOSED WOODWORK (INDOORS)			
		1	3 IN. NO. 10 RH GALV WOOD SCREW		STUCCO ON WOOD			
E DROP-WIRE CLAMP		1	B MASONRY FASTENER	NO. 3	CONCRETE		FASTENERS FOR HAND-TYPE DRIVE TOOLS	
				NO. 4	MOTAR			
				NO. 5	CINDER CEMENT	BLOCK		
		1	3/16 IN. X 1 IN. B PLASTIC ANCHOR		BRICK			
		1	1 IN. NO. 8 RH GALV WOOD SCREW		WOOD SIDING OR SHINGLE AND METALLIC SIDING ON WOOD		LOCATE SCREW APPROXIMATELY 1 IN. ABOVE BOTTOM SHINGLE OR CLAPBOARD	
1	3/16 IN. X 3 IN. NO. 8 TOGGLE BOLT		HOLLOW WALL					
1	NO. 8 B WALL SCREW ANCHOR							

* THE L TYPE IS EQUIPPED WITH A LONGER SHANK

4.02 Table B indicates the drop, block, and multiple drop wire capacity of wire loops, drive rings, bridle rings, and insulated screw eyes.

TABLE B
WIRE CARRYING CAPACITY

TYPE OF RING OR INSULATED SCREW EYE	SIZE	MAXIMUM NUMBER OF WIRES		
		F OR C (MD) DROP WIRE	BLOCK WIRE	MULTIPLE DROP WIRE
Drive Rings	1/2	2	3	0
	5/8 and 5/8 L*	6	9	1
	7/8 and 7/8 L*	16	22	2
	1-1/4 and 1-1/4 L*	30	40	5
C Wire Loops†	No. 1/2	2	3	0
	No. 5/8	6	9	1
	No. 7/8	16	22	2
	No. 1-1/4	30	40	5
C Bridle Rings	7/8	6	9	1
	1-1/4	16	22	2
	1-5/8	30	40	5
	3	100	140	16
B or M Bridle Ring	1-1/4	16	22	2
Insulated Screw Eyes	5/8 S and L*	4		0
	1 S and L*	10		1

* L represents longer shank.

† Install with suitable B masonry fasteners.

5. INTERMEDIATE ATTACHMENTS ON BUILDINGS

5.01 Make all vertical or horizontal attachments on a straight line. For best results, stretch a chalk line between the two points of the run, check that the line is tight and snap it squarely against the wall. Use this as a guide line.

5.02 Drop or block wires extending from **unexposed** plant or **exposed** plant from fuseless protector should be supported with the following attachments.

- Drive rings on wood frame building.
- C wire loops and a suitable B masonry fastener on masonry surfaces.
- Toggle bridle rings on hollow surfaces.
- Bridle rings as a substitute for drive rings when:
 - (a) Drive rings are likely to split woodwork.
 - (b) An intermediate support is needed for greater wire carrying capacity.

5.03 Drive rings equipped with a D drive anchor or C bridle rings equipped with a D plastic anchor may be used on masonry surfaces if they can be used in situations to better advantage than C wire loops.

5.04 On buildings covered with aluminum or vinyl siding, the attachment should be made close to but not in the vertical joint or lap between two pieces.

5.05 Any holes made in aluminum or vinyl siding must be sealed with a caulking compound.

5.06 **Exposed** drop wire runs that require fused protection and that are to be attached to a flammable surface should be supported with:

- Insulated screw eyes.
- C knob may be used if not more than two wires are to be placed.

5.07 Figures 1 through 9 illustrate spacing of typical wire runs using a variety of attachments.

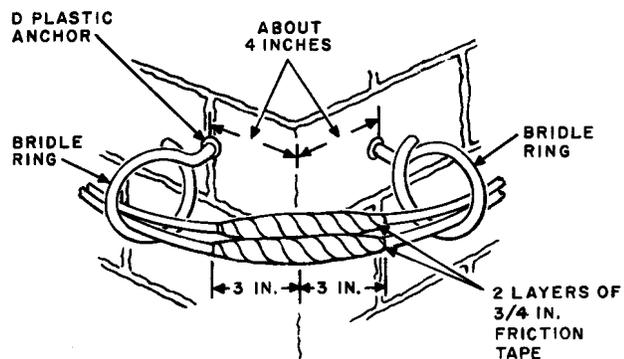


Fig. 1—Bridle Ring

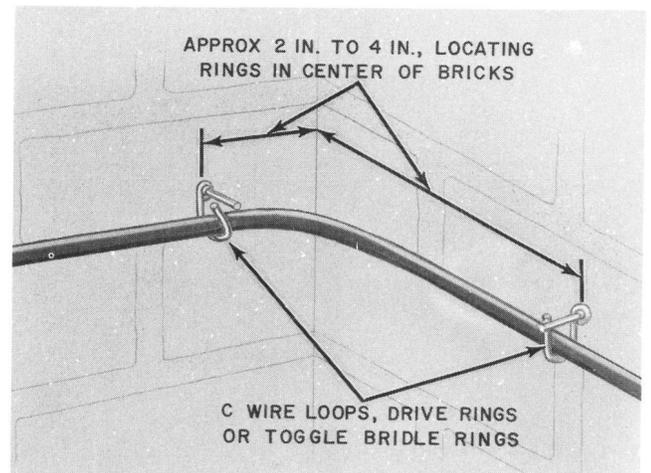
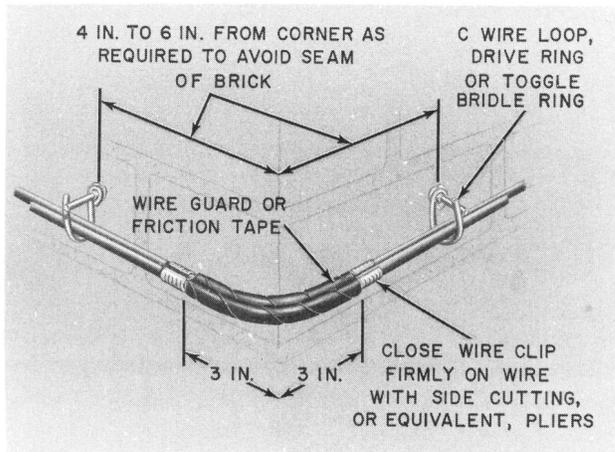
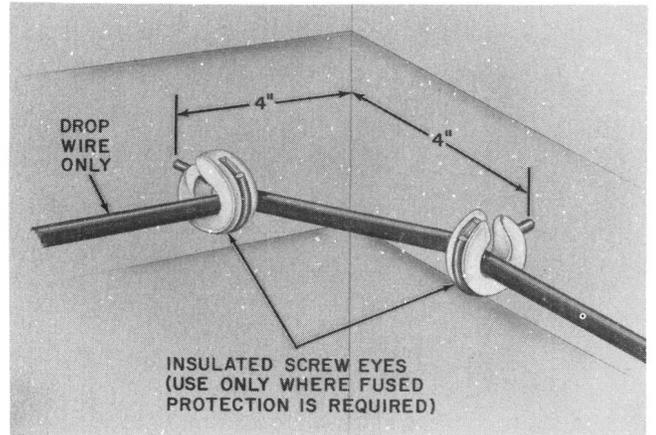
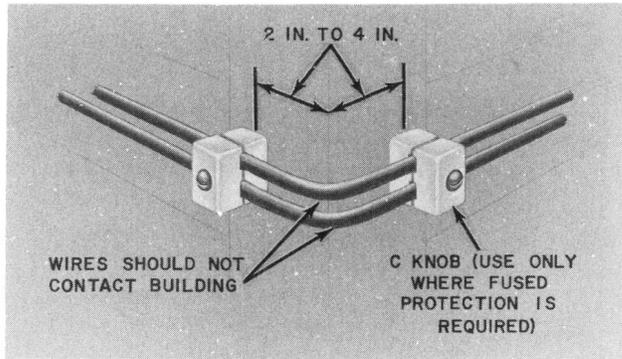


Fig. 2—Intermediate Building Attachments at Outside Corners

Fig. 3—Intermediate Building Attachments at Inside Corners

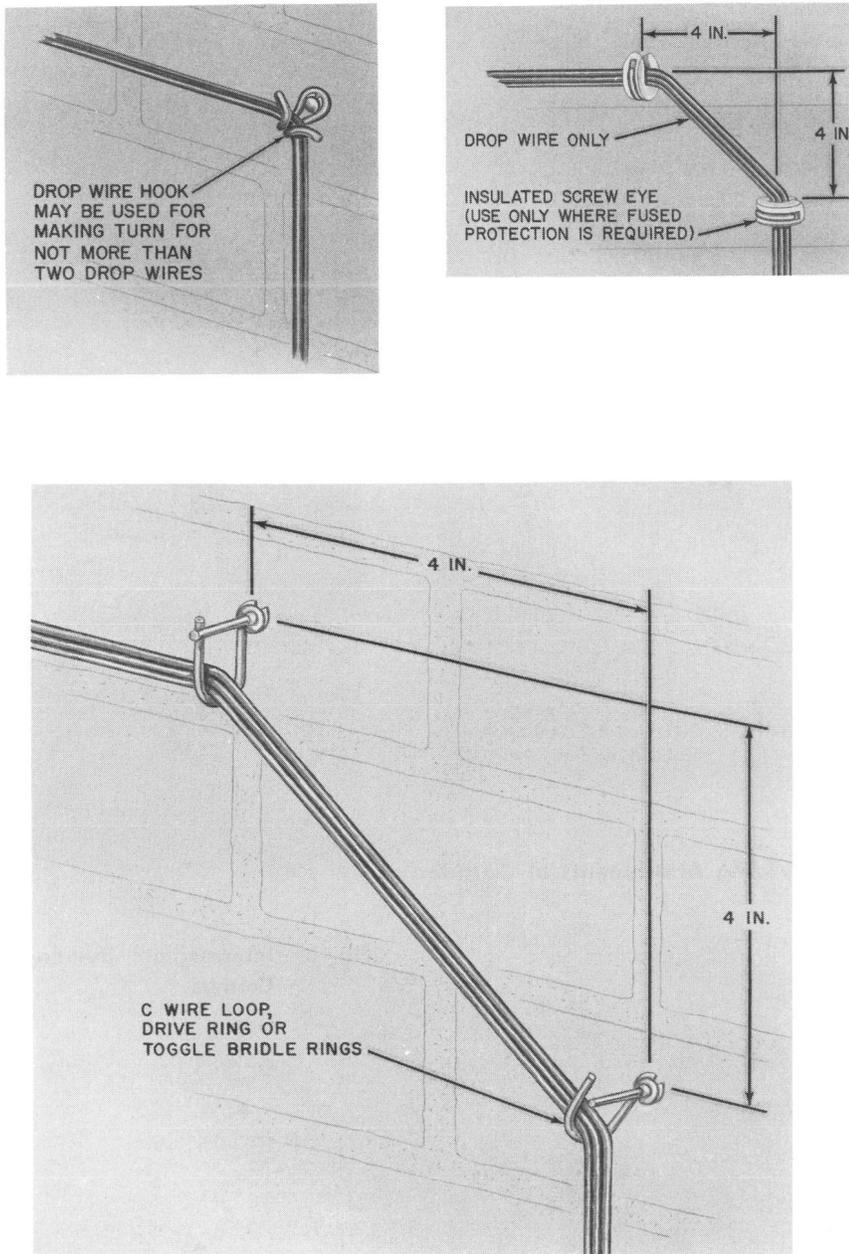


Fig. 4—Intermediate Building Attachments to Change Direction of Wire Run

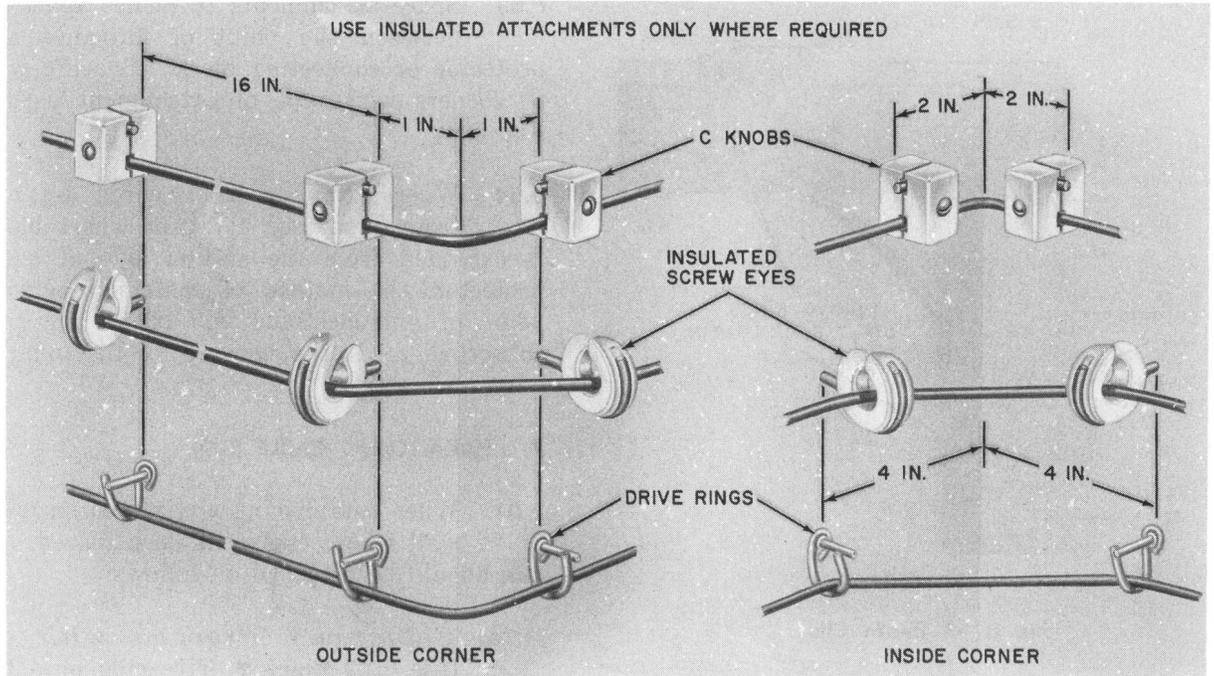


Fig. 5—Attachments Inside of Building

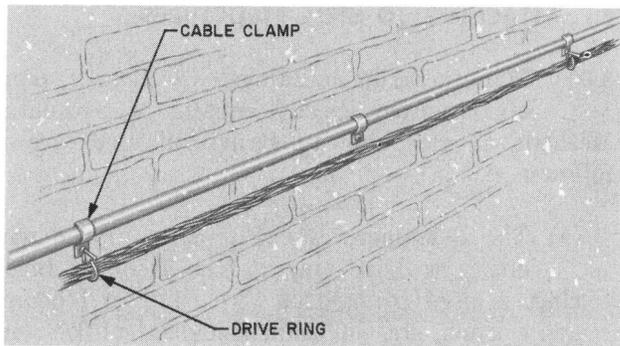


Fig. 6—Drive Ring or Bridle Ring Run Paralleling Cable Attached with Cable Clamps

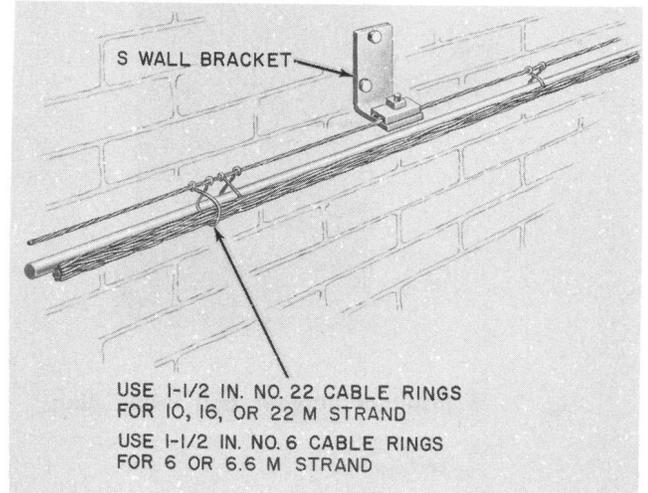


Fig. 7—Wire Run in Cable Rings Paralleling Cable Supported with Strand

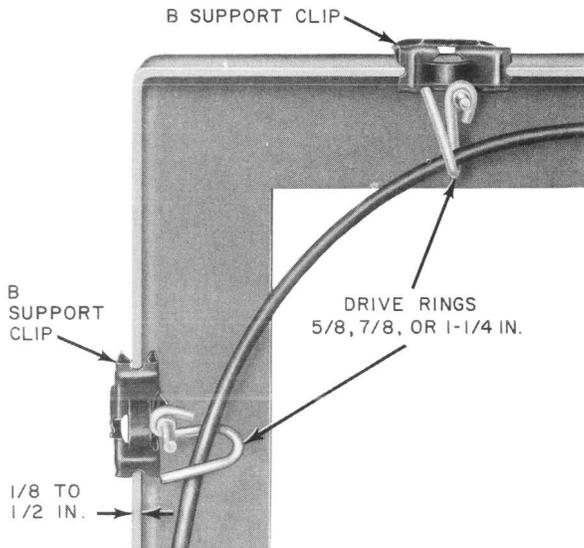


Fig. 8—B Beam Clip

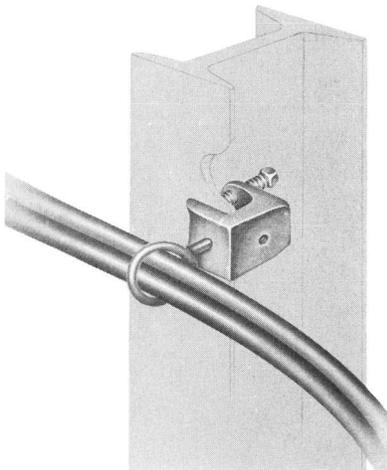


Fig. 9—B Insulator Support and Bridle Ring

6. INTERMEDIATE ATTACHMENT INSIDE BUILDINGS

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

6.02 Exposed runs that require fused protection and attach to flammable surfaces must be supported with insulated attachments.

6.03 Space attachments 16 inches apart on runs between the point of entrance and the protector or connecting block. Spacing will vary at corners with type of attachment used. (See Fig. 5.)

6.04 Where drop or block wires are extended from unexposed plant, or where block wire is extended from the station side of a fuseless protector, the method of fastening between the point of entrance and the connecting block or subscriber set is the same as for fastening station wire.

7. PARALLELING CABLE RUN

7.01 When establishing a wire run on a building wall where cable has been placed, the wire run should be attached as follows:

(a) **Cable run attached with clamps**

(Fig. 6): Place a drive ring or a C bridle ring in every third cable clamp where clamps are 16 inches apart and in every other clamp when they are 24 inches apart.

(b) **Cable run supported by strand** (Fig. 7):

Attach cable rings on the outside of the cable run and space them at double the spacing of the cable ring.

8. ATTACHING TO STEEL STRUCTURES

8.01 Manufacturing buildings, warehouses, piers, etc, require special means of attaching. Methods of attaching to structural steel are as follows:

(a) The B support clip (Fig. 8), equipped with either a drive ring or the B or M bridle ring, is used to support wire runs on I beams, angle irons, etc, on beam thickness of 1/8 inch to 1/2 inch.

(b) B, C, or D insulator supports equipped with C or T knobs, bridle rings, or a one bolt clamp can be used in various applications to attach to I beams, angle irons, etc.

- B insulator support (Fig. 9) will accommodate B or M bridle rings only. It can be attached to steel structures up to 3/4 inch in thickness.

- C insulator support (Fig. 10) will accommodate T knobs, one bolt guy clamps, and B or M bridle rings. It can be attached to steel structures up to 1 inch in thickness.

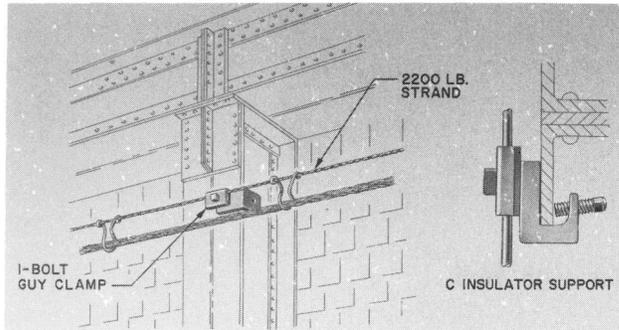


Fig. 10—C Insulator Support and One-Bolt Guy Clamp

- D insulator support (Fig. 11) will accommodate S knobs or B or M bridle rings. It can be attached to steel structures up to 3/4 inch in thickness.

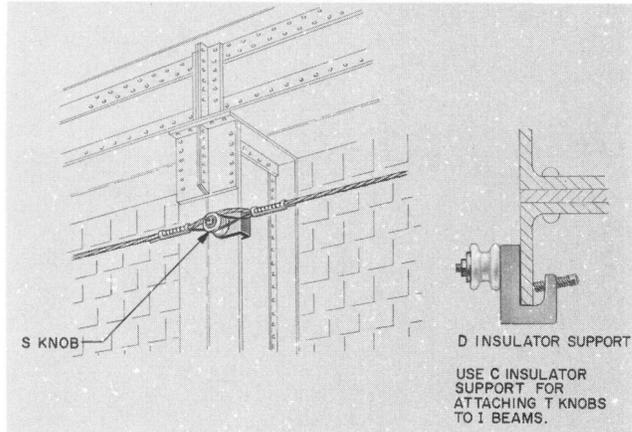


Fig. 11—D Insulator Support and S Knob

9. AERIAL BLOCK WIRE SPANS

- 9.01 Block wire must not be used in aerial spans that will introduce an exposure.
- 9.02 Where aerial span crosses driveway or private property, provide proper clearances.

9.03 Where span is 5 feet or less, bridle wire may be run without special supports, ie, without being attached to knobs or drop wire hooks at the ends of the span. Where a good appearance is not essential and the run is out of the reach of children, this distance of unsupported bridle wire may be increased to 12 feet. Where span is longer than this distance, use construction specified in 9.04 through 9.06.

9.04 Where only a few bridle wires will be run and the span is 35 feet or less in length, the construction shown in Fig. 12 may be employed.

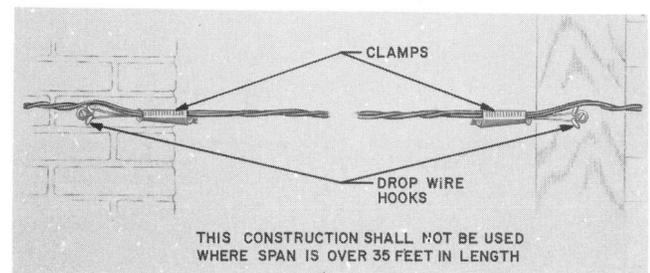


Fig. 12—Span Less Than 35 Feet in Length

9.05 Where span is more than 35 feet in length, use either drop wire attached at each end on drop wire hooks or bridle wire supported on 2200-pound strand as specified in 9.06.

9.06 Where span exceeds lengths specified in 9.03 or 9.04, bridle wire may be run in 1 1/2-inch No. 22 cable rings attached to 2200-pound strand. Space cable rings 3 feet apart. Place a drag line in the rings of the crossing span at the time they are attached. The drag line should always be replaced after it has been used for pulling wires across the aerial block wire span. This may be done at the time of pulling in additional wire by attaching a new drag line to the existing line and pulling the new line into the rings at the same time the wire is pulled in. Tie the drag line at the end of the strand. (See Fig. 13, 14, and 15.)

9.07 Fasten 1/2-inch wall strap to wooden building with two 3/8- by 4-inch coach screws installed in studding. Bore 1/4-inch lead holes for drive screws.

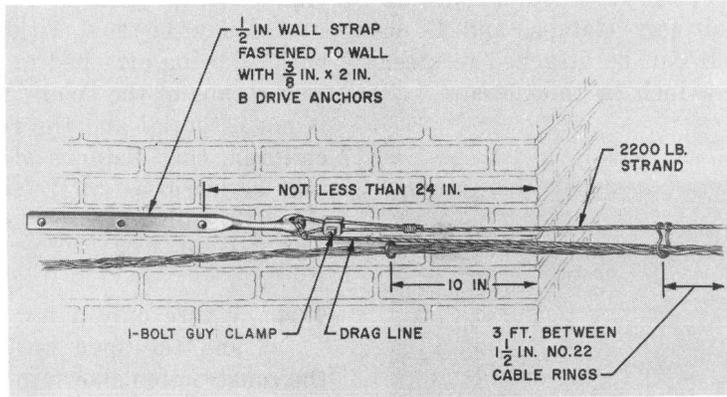


Fig. 13—Span in Line with Wall

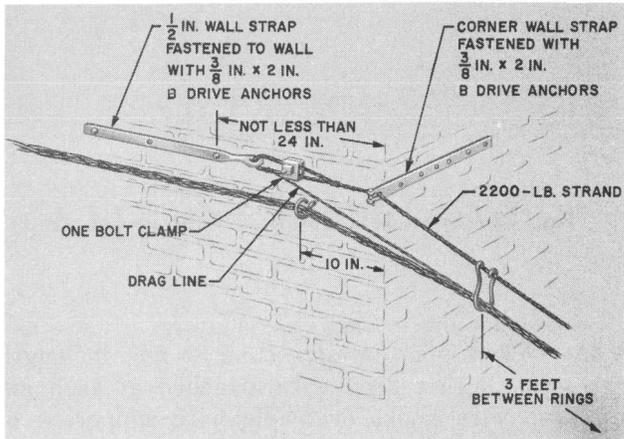


Fig. 14—Span from Corner of Wall

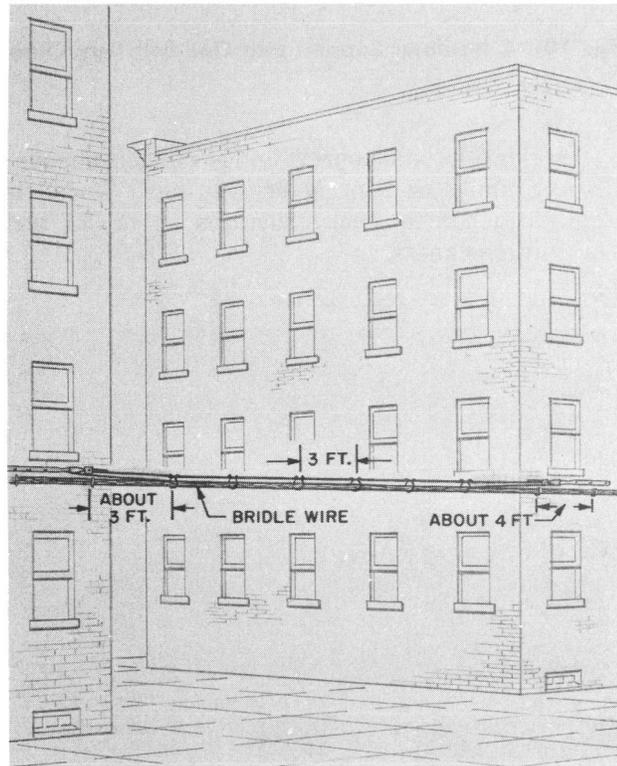
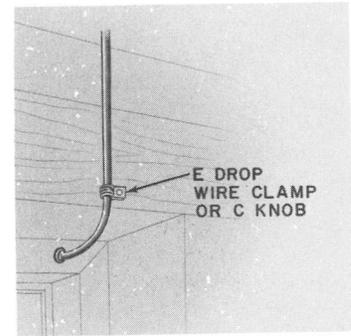


Fig. 15—Strand Run

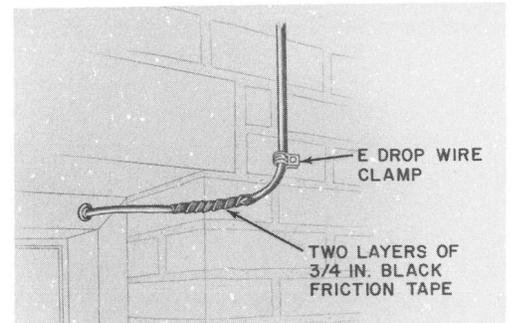
10. EQUIPPING AND INSTALLING W LEADER BRACKET

10.01 The W leader bracket is a metal strap designed to be installed over small obstructions such as pipes, rain spouts, etc, on walls. The bracket will clear obstructions extending 5 inches from wall surfaces. The W leader bracket has a single-tapped hole in the center for equipping it with a B or M bridle ring.



11. PARTY LINE TAPS

11.01 In making a party line connection, a bridge may be made at the most accessible point in an existing wire run, provided this point is 50 feet or more away from the terminal or if there is no space available on the binding posts for terminating the new party. If the most convenient point for bridging in the run is within 50 feet of the terminal, run the wire to the terminal, provided there is space available on the binding posts.



12. LAST ATTACHMENTS

12.01 The last attachment should be located within 18 inches of the building entrance hole.

12.02 Use the C knob on exposed wires that pass through a flammable surface. The E drop wire clamp is used in unexposed wires.

12.03 Figures 16 and 17 illustrate typical arrangements of last attachments.

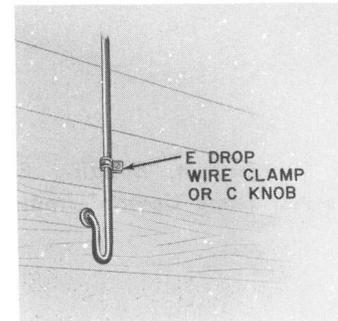


Fig. 16—Last Attachment, Building Entrance Slopes Upward from Outside

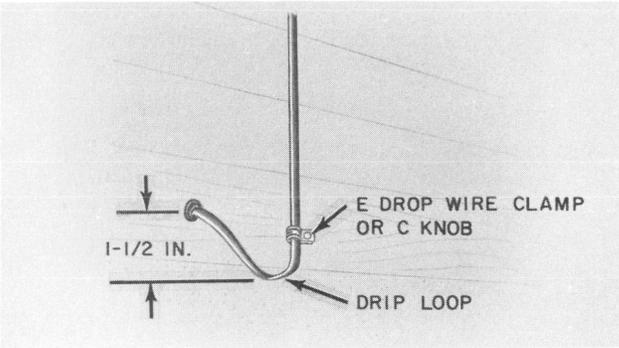
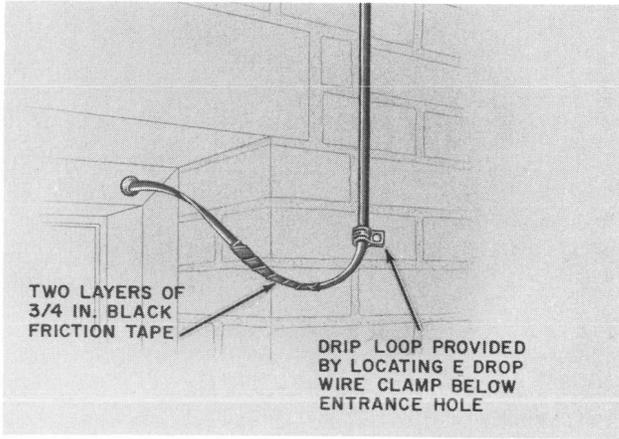


Fig. 17—Last Attachment, Building Entrance Hole Does Not Slope Upward from Outside

13. BUILDING ENTRANCE HOLES FOR DROP AND BLOCK WIRES

13.01 Use plastic tubes at building entrance holes for drop wire where fused protection is required and the wire passes through a flammable surface. Place tube as shown in Fig. 18. Cut plastic tubes with a hack saw or diagonal pliers. Do not use split tubes at entrance holes.

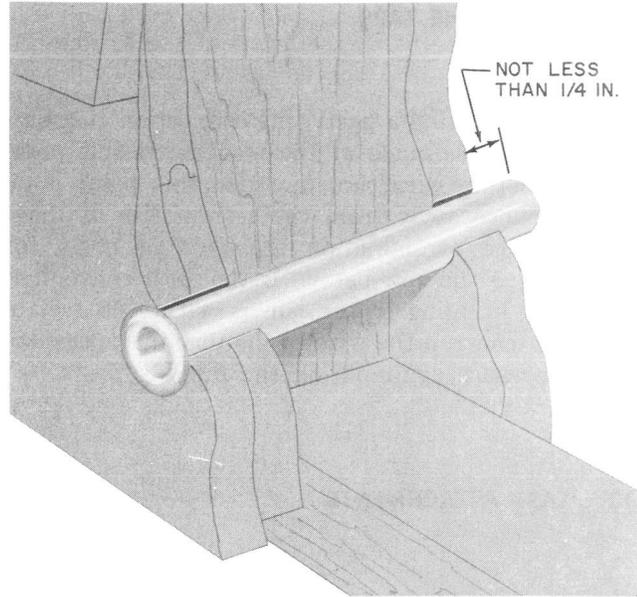


Fig. 18—Placing Tube

13.02 The B entrance plug (Fig. 19) is intended primarily for use with C or F drop wires and is furnished in 1/2- and 3/4-inch diameter sizes. This plug may be used:

- To seal unused entrance holes in buildings to prevent entrance of rain, wind, insects, etc.
- To mechanically protect wire against abrasion.
- In place of plastic tube at building entrance hole on stations not requiring fused protection.

13.03 B entrance plug may be added to existing drop wire by separating partial split provided on inside surface of plug.

13.04 When drilling building entrance holes, consider the following:

- (a) Drill holes away from side where appearance is most importance.
- (b) Slope holes upward from outside.
- (c) Use seams when drilling through masonry.
- (d) Exercise care to avoid splintering wood or cracking masonry or brick.
- (e) Drill clearance hole on all types of shingle siding.

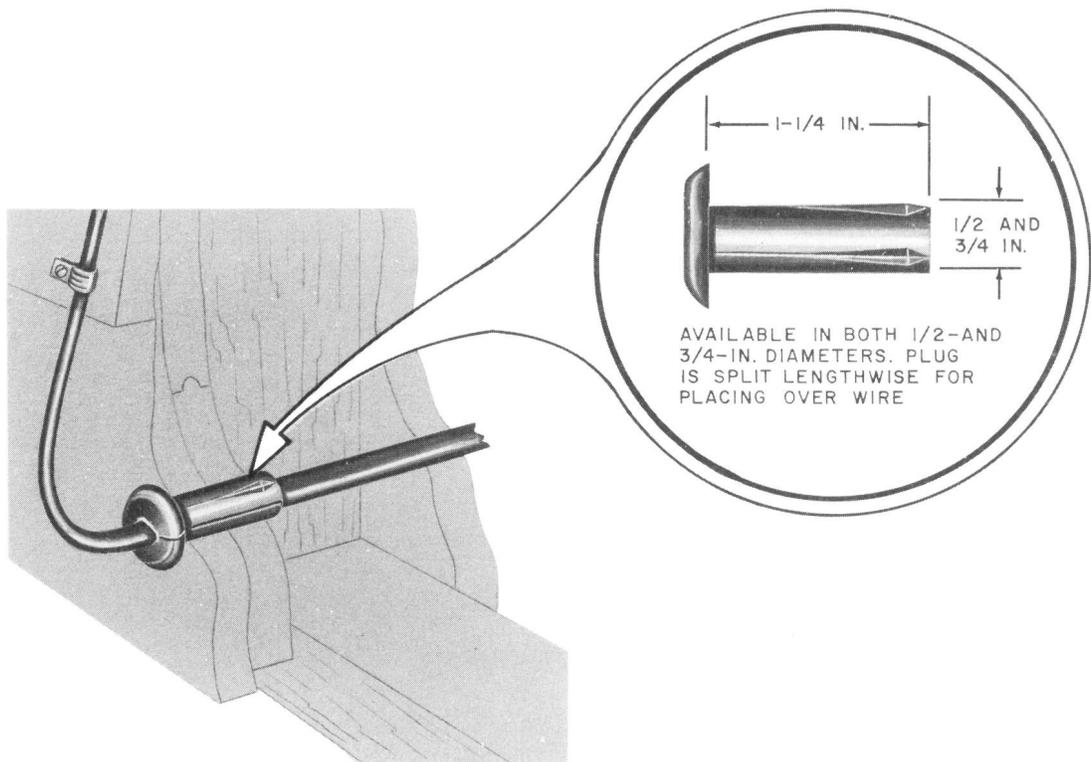


Fig. 19—B Entrance Plug

SECTION 462-350-214

13.05 Sizes of building entrance holes for wires and plastic tubes are shown in Table C.

TABLE C
SIZES OF BUILDING ENTRANCE HOLES
FOR DROP AND BLOCK WIRES AND PLASTIC TUBES

TYPE	WIRE, QUANTITY						
D Block (Bridle)				2	3	4	5
C or F Drop	1	2	3	1	2	3	4
	PLASTIC TUBE REQUIRED			TUBE NOT REQUIRED			
Tube Size, Inch	3/8	1/2	5/8				
Entrance Hole Size, Inch	1/2	5/8	3/4	3/8	1/2	5/8	3/4

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