

## DROP AND BLOCK WIRING

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

#### 1. INTRODUCTION

1.01 This section specifies:

- The methods of fastening and equipping intermediate and last attachments.
- The fastener to be used on various types of walls.
- The methods of running drop and block wire on building walls and structures.
- The methods of running drop and block wire inside of buildings.
- The rules to be followed in planning drop and block wire runs on buildings.

1.02 The attachments to be used in any installation depend on a number of factors, such as:

- Number of drops to be used.
- Type of surface to be attached to.
- Insulated or non-insulated attachments.

#### 2. GENERAL

2.01 The M bridle ring is a closed type ring.

A machine screw 10-24 thread is provided at one end for use with insulator supports or B beam clips.

2.02 The B beam clip can be used with drive rings or machine threaded bridle rings to support drop wires on structural framework for intermediate attachments.

2.03 The 1/2-inch L drive rings are equipped with nails 1/2 inch longer than those used in regular similar sizes. They are intended for use on building walls covered with thick siding mat-

erials through which adequate penetration cannot be obtained with regular rings.

2.04 When using ladders to install attachments, observe precautions covered in Division 081.

#### 3. RULES

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

**Caution:** Do not use block wire as any part of the connection between exposed plant and the protectors, except when used as the bridle fuse wire on stations served from open wire, C rural, or 19-gauge multiple line wire with a 123A1A protector. Block wire may be used on the station side of protector.

(a) Rules applying to both drop and block wire runs.

(1) Plan the wire run so that the locations of the points of entrance and of the station protectors, where the latter are required, will conform to the rules covered in the Section entitled Station Protection, Installation.

(2) NC, and NE drop wires and Z and X multiple drop wires working out of metal sheath cable shall be supported on uninsulated building attachments on all types of building walls. (Where station protection is required, the Z and X multiple drop wire shall be fully protected with fuseless protectors.)

(3) Drop wires connecting to open wire circuits, however, shall be separated from flammable building walls such as wood, stucco on wood, or metallic siding on wood and supported on insulated building attachments.

(4) Locate the first building attachment for drop wire and the attachments for block wires so that the wires will have the required clearance above highways, driveways, walks, private property, roofs, etc.

(5) If it is necessary to cross or parallel electric conduits, radio wiring, rain spouts, or other obstructions on buildings, obtain the required separations as outlined in Section 620-220-011.

(6) Do not run wires in front of signs or so as to interfere with fire escapes, clothes lines, awnings, shutters, hoists, doors, etc. Make adequate allowance for the normal movement of such devices.

(7) Do not place wire runs on walls which are likely to be built against in the near future.

(8) Do not run wires diagonally on a building, except in the short lengths required to change the direction of the run from horizontal to vertical, etc.

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

**3.02** The following rules shall be observed only in so far as practicable, since it may be impracticable in some installations to follow all of these instructions as well as those given in 3.01.

(a) Rules applying to both drop and block wire runs.

(1) Locate the wire run with a view to permanency and accessibility. Avoid locating the run at an excessive height. Where it is impracticable to use a ladder or one is not available, attachments may be placed from windows. Install such attachments as near the preferred locations as safety permits.

(2) Do not make attachments to chimneys as the fastenings may be insecure or may result in property damage.

(3) On building walls finished with stucco, rigid composition shingles, thin-wall brick veneer, and similar materials, locate attachments on wood trim if practicable and if the trim is sufficiently substantial to provide adequate support for the drop wire.

(4) Locate the wire run preferably on the rear and side walls of a building.

(5) Locate horizontal runs above the reach of the public, particularly children.

(6) On a brick building with a stone foundation, establish the run on the brick wall rather than on the rough stone of the foundation.

(7) Avoid attaching to tin, sheet metal, and materials requiring frequent repairs or renewals.

(8) Avoid locating wire run on intermediate buildings that are in a deteriorated condition or are of a temporary nature. In such cases, it is preferable to install aerial spans between well-built permanent buildings.

(9) Select a run where the wires will be as free as practicable from mechanical injury.

(10) Locate the run so as to require the minimum length of wire and as few turns as practicable.

(11) Locate the wire run so as to avoid light and power wires and so that it will encounter a minimum number of other obstructions.

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

(13) Establish a vertical run preferably in the angle formed by intersecting walls if this would not increase the length of the run appreciably.

(14) Where ice conditions are severe, avoid locating vertical wire run within 2 feet of a leader (down spout).

**3.03** When establishing a wire run on a building wall where cable has been placed, the wire run should, in general, parallel the cable run. If practicable, rings installed in conjunction with the cable clamps should be utilized for such runs.

**3.04** 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 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 because of low insulation, replace the portion which would be likely to introduce trouble.
- (5) Remove strings or other foreign matter which may detract from wire run appearance.

**3.05** A large number of bridle wires in a ring run is uneconomical; where the number exceeds six, call the attention of your supervisor to the condition in order that the question of placing block cable may be considered.

#### **4. SPACING OF ATTACHMENTS**

**4.01** Space drop wire attachments 9 feet or less

apart on horizontal runs and 12 feet or less apart on vertical runs.

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

**4.03** Place additional attachments as required to keep exposed wires terminated at fused-type protectors from touching flammable surfaces.

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

**4.05** When paralleling cable is attached to building wall by cable clamps, place rings in every third cable clamp where clamps are 17 inches apart and in every other cable clamp where clamps are 26 inches apart.

**4.06** When paralleling cable is placed on a strand, use cable rings for block wires.

#### **5. WIRE CARRYING CAPACITIES OF DRIVE RINGS, BRIDLE RINGS, AND INSULATED SCREW EYES**

**5.01** Table A indicates the type and size of bridle rings, drive rings, and insulated screw eyes to be used under various conditions.

**5.02** Table B indicates the drop, block, and multiple drop wire capacity for drive rings, bridle rings, and insulated screw eyes.

**5.03** Table C indicates the fastener to be used on drop and block wire attachments on various types of walls.

TABLE A

TYPE AND ULTIMATE SIZE OF WIRE RUN	TYPE		
	Z BRIDLE RING	DRIVE RING	INSULATED SCREW EYE
In runs where not more than six bridle wires will be required	1-1/4 in.	5/8 in.	5/8 in.
In runs where more than six bridle wires will be required	1-1/4 in.	7/8 in.	1 in.
At distributing terminals 16 pairs or less	1-1/4 in.	7/8 in.	
In runs where bridle rings with machine screw shanks are required	M bridle ring		

TABLE B

TYPE OF RING OR INSULATED SCREW EYE	SIZE	MAXIMUM NUMBER OF WIRES		
		NC OR NE DROP WIRE	BLOCK WIRE	MULTIPLE DROP WIRE
Drive Rings	1/2 and 1/2 L*	2	8	0
	5/8	6	9	1
	7/8	16	22	2
Z Bridle Rings	1-1/4	16	22	2
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.

**TABLE C**  
**FASTENERS FOR DROP AND BLOCK WIRE ATTACHMENTS**

ATTACHMENT		FASTENER		TYPE OF CONSTRUCTION	REMARKS
		QUANTITY	TYPE		
Drive Rings	1/2 in.	1	3/16 in. x 7/8 in. hammer drive anchor	Masonry or Substantial brick veneer	
	5/8 in. and 7/8 in.	1	1/4 in. x 1 in. hammer drive anchor		
	1/2 in. L	1	1/4 in. x 1-1/2 in. hammer drive anchor		
Z Bridle Rings	5/8 in.	1	5/8 in. x 6-3/4 in.	Brick Veneer	
M Bridle Rings		1	B beam clip insulator support	Angle irons, I beams, etc.	
C Knob (used only where fused protectors are required)		1	2-1/2 in. No. 10 RH galvanized wood screw	Exposed wood-work (outdoors)	Locate screw approximately 1 in. above bottom shingle or clapboard.
		1	2 in. No. 8 RH wood screw	Exposed wood-work (indoors)	
		1	3 in. No. 10 RH galvanized wood screw	Stucco on wood	
E Drop Wire Clamp		1	1 in. No. 8 RH galvanized wood screw in a No. 10 plastic anchor	Brick	
		1	1 in. No. 8 RH galvanized 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. toggle bolt	Hollow tile	

**Note:** The L type is equipped with longer shank.

## 6. INSTALLING DRIVE RINGS, AND Z BRIDLE RINGS

**6.01** Drive rings (with suitable masonry fasteners) should be used wherever metal rings are permitted by the Practices. Z Bridle rings may, however, be substituted for drive rings on brick veneer under the following conditions:

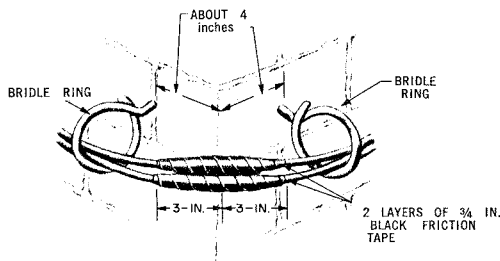
- (a) Where point of drive-ring nail would extend beyond the wood frame of a building, contractor's shanty, etc.
- (b) Where it is likely that clothing would catch on drive rings installed in narrow passageways, alleys, etc.
- (c) Where property owner objects to drive rings.
- (d) Where drive rings are likely to split wood-work.
- (e) In situations where Z bridle rings can be used to better advantage than drive rings.

***Wear eye protection when drilling holes or driving masonry fasteners into masonry or brick walls.***

## 7. PLACING Z BRIDLE RINGS AND INSULATED SCREW EYES

**7.01** Place Z bridle rings and insulated screw eyes where run is horizontal, so that the opening is at the top. On bends, the opening shall be at the outer side of the bend.

**7.02** Where a wire run turns an outside corner of the supporting structure, place bridle rings or insulated screw eyes as shown in Fig. 1.



**Fig. 1 — Z Bridle Rings**

## 8. INSTALLING INSULATED SCREW EYES AND C KNOBS

**8.01** Insulated screw eyes should be used in place of drive rings or Z bridle rings on drops where fused station protection is required and where the building walls are flammable material such as wood, stucco on wood, and metal siding on wood.

**8.02** The C knob may be used as an intermediate attachment where not more than two wires are to be placed.

## 9. EQUIPPING AND INSTALLING W LEADER BRACKET

**9.01** 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 five inches from wall surfaces. The W leader bracket has a single-tapped hole in the center for equipping it with an M bridle ring.

## 10. EQUIPPING AND INSTALLING INSULATOR SUPPORTS AND B BEAM CLIPS ON STEEL STRUCTURES

**10.01** The B, C and D insulators support and the B beam clip are used to secure intermediate attachments to I beams, angle irons, etc.

**10.02** The B, C or D insulators support may be equipped with an M bridle ring.

**10.03** The B beam clip may be equipped with an M bridle ring or a 5/8 or 7/8 inch drive ring.

**10.04** B, C or D insulator supports are secured to steel structures by tightening set screws. They may be used on flanges up to 1 inch thick.

**10.05** B beam clips are held secured by spring tension of the clip. They can be used on flanges ranging from 1/8 inch to 1/2 inch thick. On thick flanges, the B beam clip may require driving in place with a hammer.

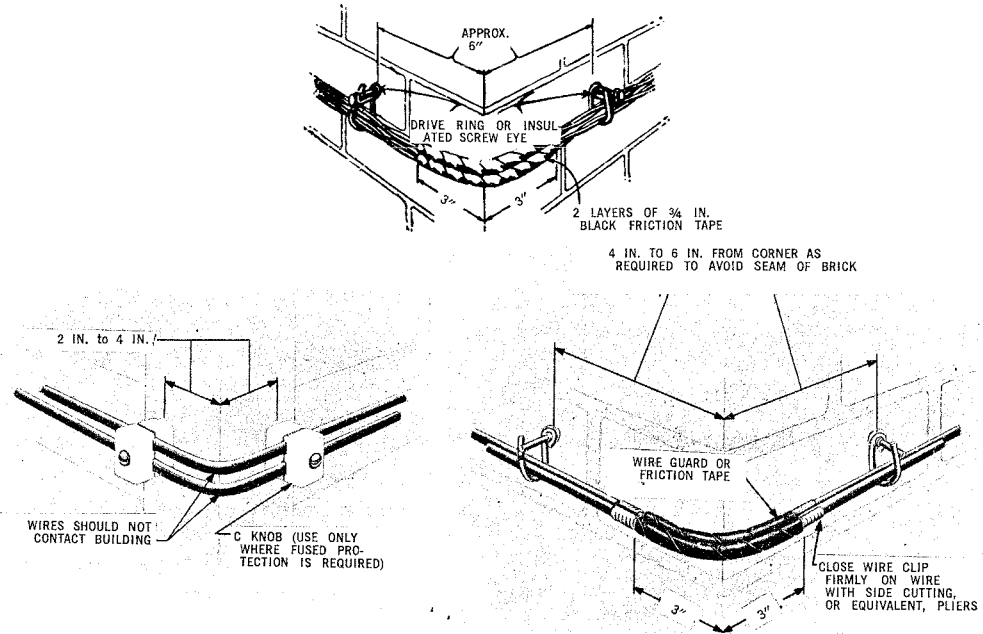
***Avoid personal injury by protecting eyes and hands when installing clip.***

## 11. INTERMEDIATE ATTACHMENTS ON BUILDINGS

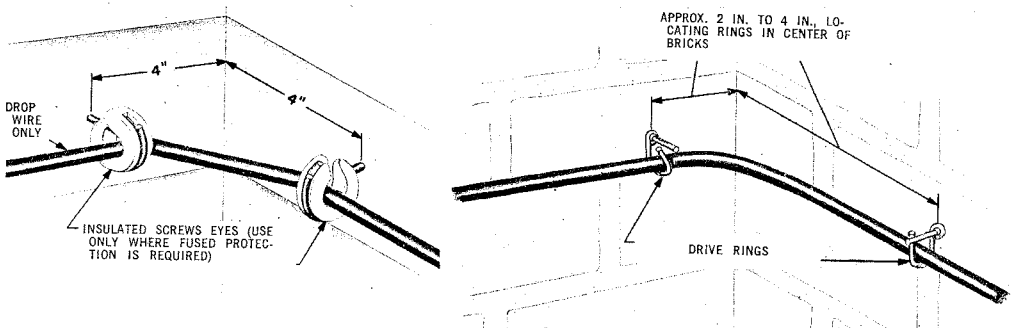
**11.01** In order to locate a line for the straight run, either horizontal or vertical, a chalk line may be stretched between two points of the run and line snapped against the wall. When locating ring run in this manner, insure that the chalk line is tight enough and that points selected

are close enough together so that there is no appreciable sag in the line. Snap the chalk line squarely against the wall.

**11.02** Typical drop and block wire runs using a variety of attachments are shown in Fig. 2 through 5.



**Fig. 2 — Intermediate Building Attachments at Outside Corners**



**Fig. 3 — Intermediate Building Attachments at Inside Corners**

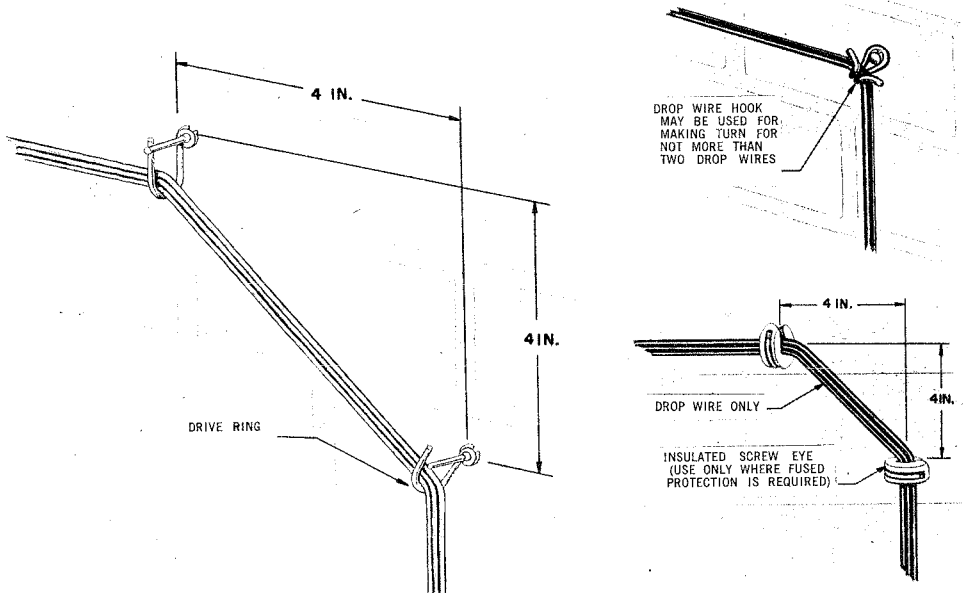


Fig. 4 - Intermediate Building Attachments to Change Direction of Wire Run

## 12. PARALLELING CABLE RUN

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

Cable run attached with clamps (Fig. 6)

- Place a drive ring in every third cable where clamps are 17 inches apart and in every other clamp when they are 26 inches apart.

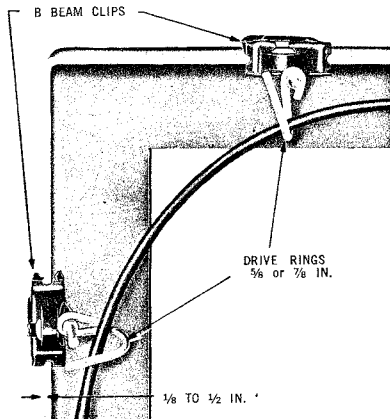


Fig. 5 - Intermediate Attachment - B Beam Clips for Use on Metal Structures

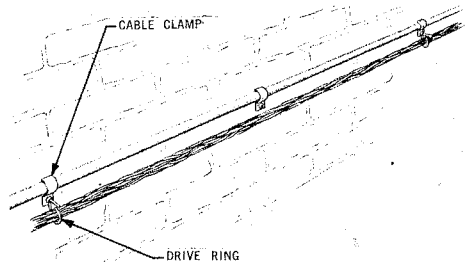


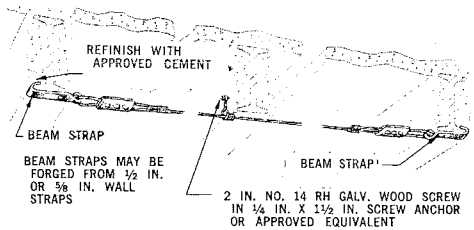
Fig. 6 - Drive Ring Run Paralleling Cable Attached with Cable Clamps



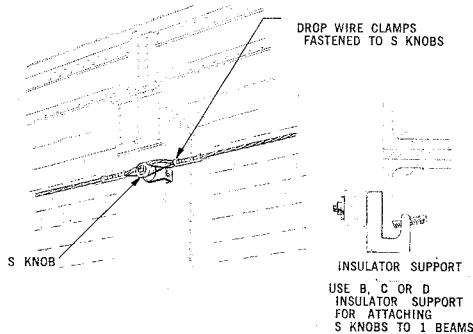
### 13. ATTACHMENTS TO INDUSTRIAL STRUCTURES

**13.01** Manufacturing buildings, warehouses, piers, etc, may require special means of attachment. Methods of attachment which have proven practicable in such cases are shown in Fig. 7, 8 and 9.

**13.02** The exact method of attachment used in this class of building will depend upon the particular type of building encountered.



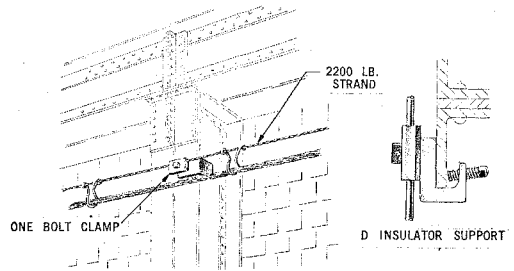
**Fig. 7 — Strand on Beam Straps**



**Fig. 8 — Strand on S Knob and One-Bolt Clamp**

### 14. AERIAL BLOCK WIRE SPANS

**14.01** Block wire must not be used in aerial spans that will introduce an exposure.

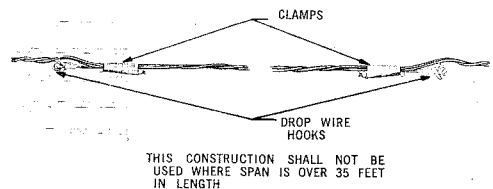


**Fig. 9 — Strand on One-Bolt Clamp**

**14.02** Where aerial span crosses driveway or private property, provide proper clearances.

**14.03** Where span is 5 feet or less, bridle wire may be run without special supports, that is, 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 14.04 to 14.05.

**14.04** Where only a few bridle wires will be run and the span is 35 feet or less in length, the construction shown in Fig. 10 may be employed.



**Fig. 10 — Span Less Than 35 Feet in Length**

**14.05** Where span is more than 35 feet in length, use drop wire attached at each end on drop wire hooks.

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**14.06** In blocks where the growth will be slow, the wires may be run along the backs of buildings attached to drop wire hooks S knobs, provided span length will not exceed 35 feet.

**14.07** Use a S knob for each drop wire.

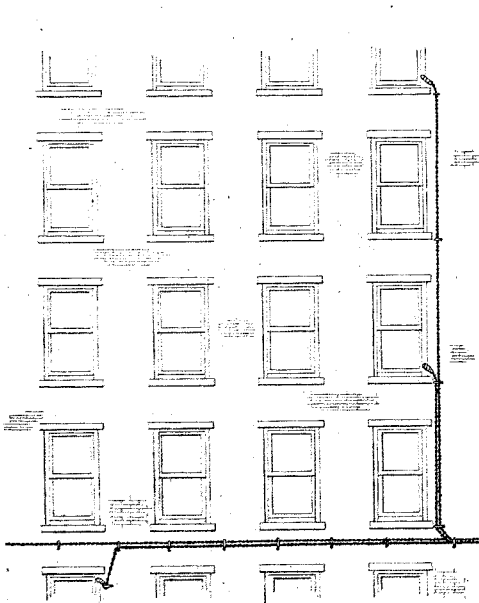
### 15. PARTY LINE TAPS

**15.01** In making a party line connection, a bridge may be made at the most accessible point in an existing wire run, provided that this point is

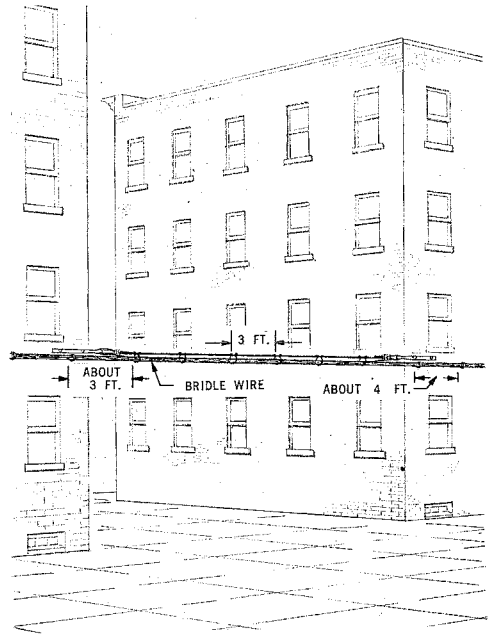
50 feet or more away from the terminal or if there is no space available on the binding posts for terminating the new party. If the most convenient point for bridging in the run is within 50 feet of the terminal, run the wire to the terminal provided that there is space available on the binding posts.

### 16. TYPICAL BLOCK WIRE RUNS

**16.01** Typical building runs are shown in Fig. 11 through 14.



**Fig. 11 — Drive Ring Run**



**Fig. 12 — Existing Strand Run**

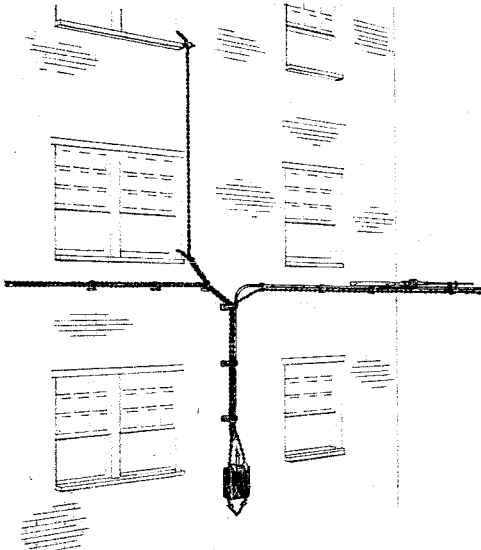


Fig. 13 — Drive Ring, Cable Clamp Ring,  
and Strand Run

#### 17. METHODS OF FASTENING DROP AND BLOCK WIRES INSIDE OF BUILDINGS

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

**17.02** Space drop wire attachments 16 inches apart on runs between the point of entrance and the protector or connecting block.

**17.03** 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

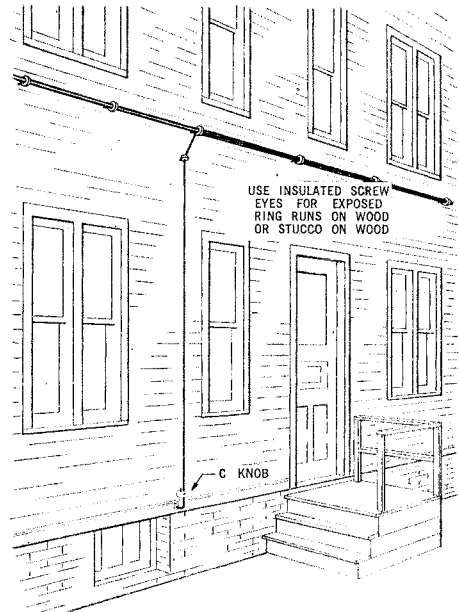


Fig. 14—Insulated Screw Eye Run (For Drop Wire Only)

point of entrance and the connecting block or subscriber set is the same as for fastening station wire.

#### 18. DROP AND BLOCK WIRE ATTACHMENTS FOR INSIDE OF BUILDINGS

**18.01** Typical drop and block wire runs within a building, some of the attachments to be used, and the spacing of attachments are shown in Fig. 15.

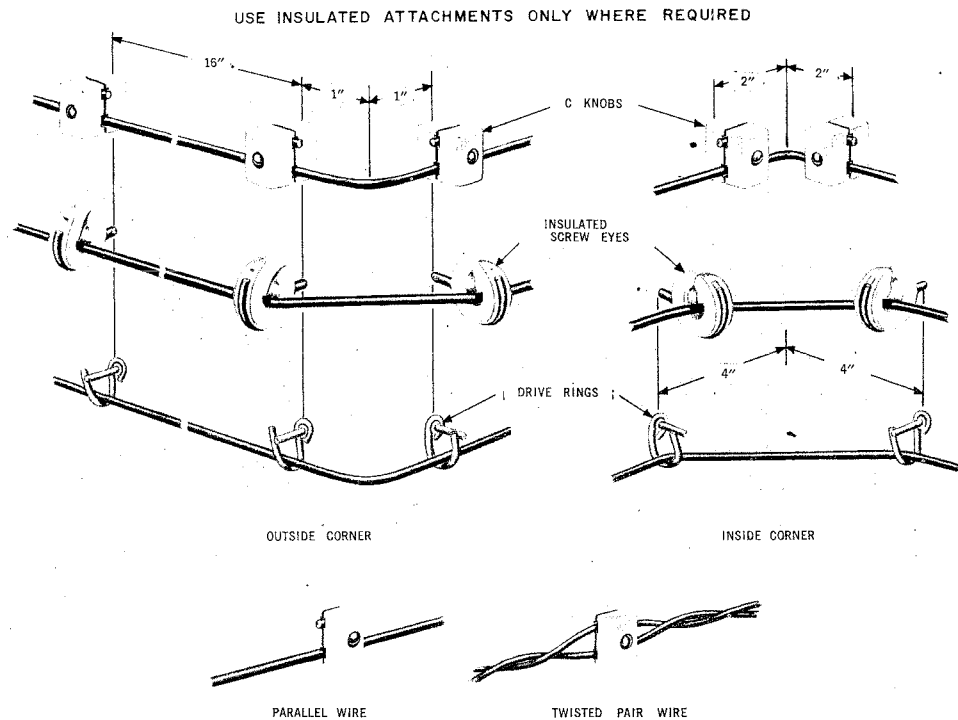


Fig. 15 — Fastening Drop and Block Wire Inside of Buildings

19. LAST ATTACHMENTS ON BUILDINGS (Fig. 16 and 17)

*Note:* The last attachments should be located within 18 inches of the building entrance hole.

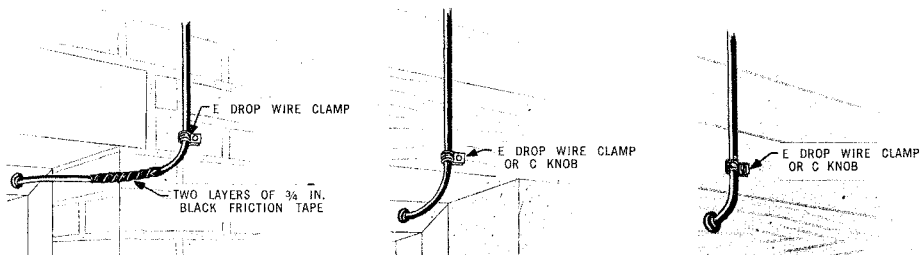


Fig. 16 — Last Attachment (Building Entrance Hole Slopes Upward from Outside)

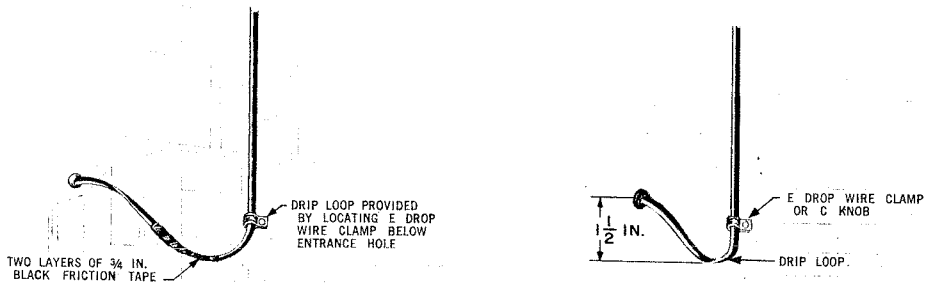


Fig. 17 — Last Attachment (Building Entrance Hole Does Not Slope Upward from Outside)

## 20. BUILDING ENTRANCE HOLES FOR DROP AND BLOCK WIRES

**20.01** 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.

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

- (a) Drill holes away from side where appearance is most important.
- (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.

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

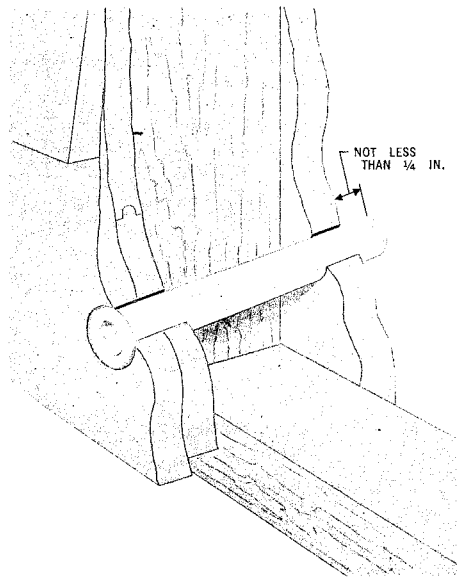


Fig. 18 — Placing Tube

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

WIRE	ENTRANCE HOLES							
	PLASTIC TUBE REQUIRED			TUBE NOT REQUIRED				
	TUBE SIZE, INCH							
	3/8	1/2	5/8	HOLE SIZE, INCH				
	HOLE SIZE, INCH							
	1/2	5/8	3/4	3/8	1/2	5/8	3/4	
TYPE	WIRE, QUANTITY							
Z block (bridle)				2	3	4	5	
NC or NE drop	1	2	3	1	2	3	4	

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