

BELL SYSTEM PRACTICES
Station Installation and Maintenance

SECTION C22.021
Issue 1, 9-1-31
Standard

BUILDING ENTRANCES

1. GENERAL

1.01 This section covers the selection of building entrances, the drilling or boring of entrance holes and, where required, the placing of porcelain tubes in entrance holes.

1.02 Where a main station requires a protector and it is more convenient to run wire on outside of building from station side of protector or where it is more convenient to run wire on outside of building to the extension station or extension ringer, always make separate entrance holes for such wire runs.

2. MATERIAL

Tape: **3/4 inch Black Friction Tape.** For use in securely fastening porcelain tubes.

Tubes: **3/8 inch x (length) inch Solid Porcelain Tube.** Available in 4, 6, 8, 10, 12, 14, 16, 18, 20 and 24 inch lengths.

3/4 inch x (length) inch Solid Porcelain Tube. Available in 4, 6, 8, 10, 12, 14, 16, 18, 20 and 24 inch lengths.

1 inch x (length) inch Solid Porcelain Tube. Available in 4, 6, 8, 10, 12, 14, 16, 18, 20 and 24 inch lengths.

Note: Use porcelain tubes at entrance holes for:

- (a) All exposed stations, i.e., stations requiring protectors, except where protector is installed outside of building, or where entrance hole is made entirely through brick or other masonry and no contact is made with any metal.
- (b) All unexposed stations, extension stations, and extension ringers where wire is run outside of building and wood at point of entrance is rotted or water soaked due to damp location.

3. SELECTION OF ENTRANCE

General

3.01 The selection of a point of entrance is dependent on the considerations outlined in standard instructions covering the location of telephone, protector or connecting block, and interior and exterior wire runs. Therefore, before selecting a point of entrance make a survey of the premises for the location of such apparatus and wire runs with a view toward selecting a point of entrance which will meet all considerations. In some modern residences, overhead (or underground) service conduits are provided by the owners for running telephone wires. In order that such facilities be used wherever practicable, take especial care to look for them when making the survey. Illustrations of typical installations are shown in Fig. 7.

3.02 Do not select a metal store front as a point of entrance if any other point of entrance is practicable. In this connection other types of store fronts should also be avoided.

3.03 Where entrance facilities are not provided, the points of entrance for the various types of building construction should generally be in accordance with the following table:

Type of Building	Point of Entrance
Masonry or Stucco on Masonry	Through or at window or door frame (except metal door frame).
Frame or Stucco on Frame, where ceiling of basement is not plastered.	* Immediately above or through foundation sill.
Frame or Stucco on Frame, where ceiling of basement is plastered.	* Through foundation sill if it projects below ceiling; otherwise enter through window or door frame.

* In the case of frame buildings, it is occasionally desirable to enter through the wall if telephone is located on the inside of an outside wall and block or drop wire can be brought directly to subscriber set.

Foundation Sill

3.04 Make entrance hole through foundation sill so as to clear joists or studs as shown in the following typical illustrations:

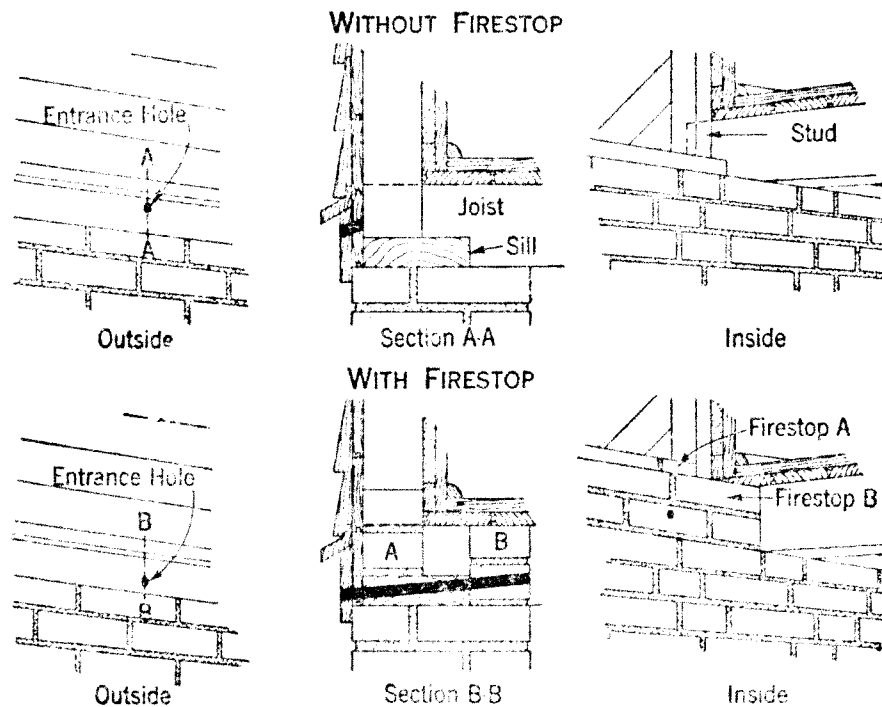


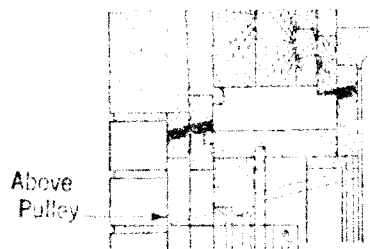
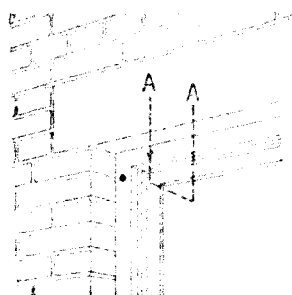
Fig. 1.

3.05 Brick firestops are sometimes placed on sill or foundation wall in cellar as shown at A and B of Fig. 1. When drilling firestops, do not make hole larger than necessary. (See Part 4 for size of entrance holes.)

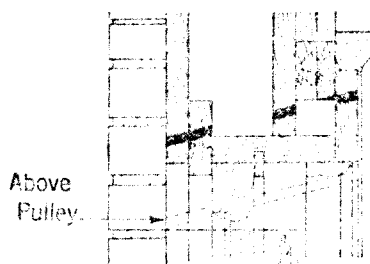
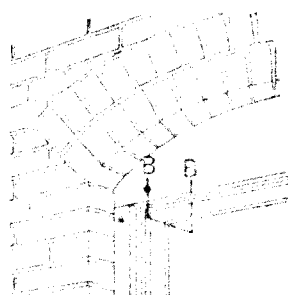
Wood Window Frames

3.06 Make entrance holes through wood window frames so as to avoid interfering with the opening or closing of windows as shown in the following typical illustrations, Figs. 2 and 3. Where side of frame at top is selected, always bore as close to the top of frame as practicable to avoid cord pulleys. (In this connection the illustrations in Fig. 2 which show desirable entrance points at the top of window frames for brick buildings are also applicable for frame buildings.) Where side of frame at bottom is used, always bore within three inches of sill to avoid entering into pocket for sash weights.

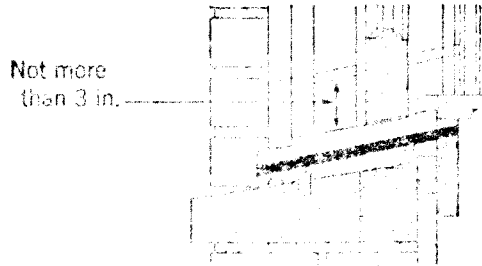
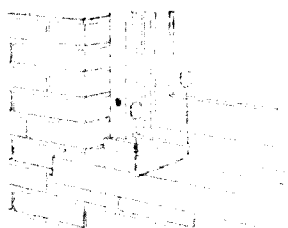
BRICK BUILDINGS - UPPER FLOORS



Section A-A

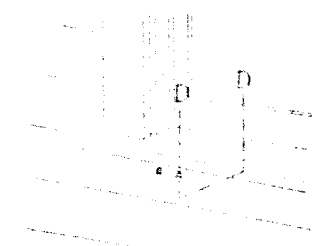


Section B-B

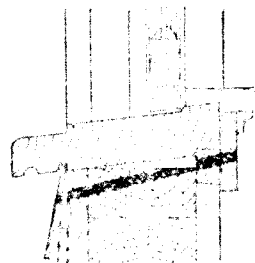


Section C-C

FRAME BUILDINGS - UPPER FLOORS



• Indicates Desirable Entrance Points



Section D-D

Fig. 2.

BASEMENT (BRICK SHOWN)

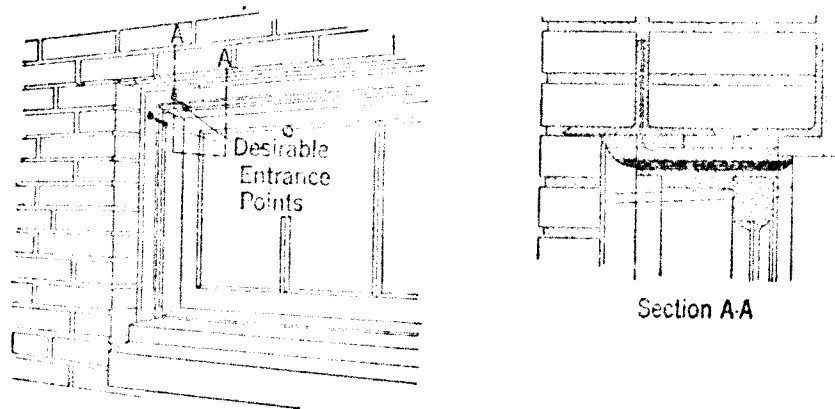


Fig. 3.

3.07 Where iron shutters or fire screens are encountered, cut slot in seam of brick so as to permit wire to be run through stile or brick in back of frame as shown in the following typical illustrations:

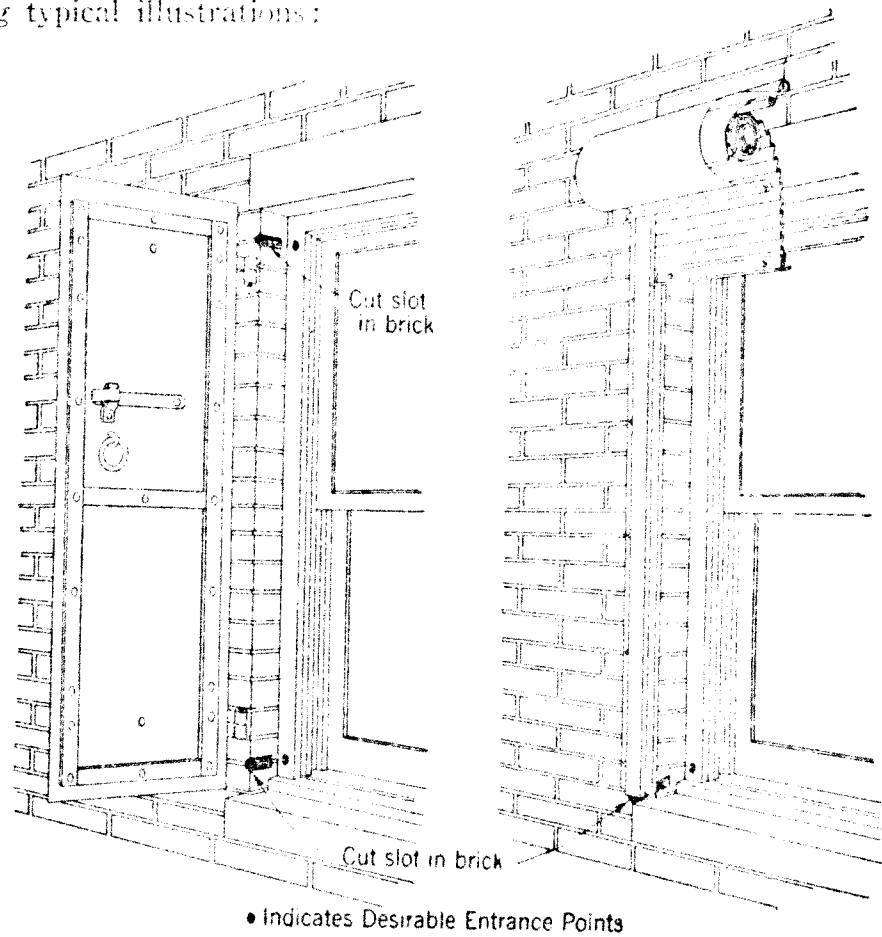


Fig. 4.

3.08 Where wood shutters are encountered, make entrance so that shutters will not be in contact with wire at any position. It will generally be found desirable to notch window frame or shutter.

Metal Window Frames

3.09 **Frame Set in Masonry:** Make entrance hole in masonry as shown in the following typical illustration. Start hole away from window frame. Drill half-way from outside and half-way from inside.

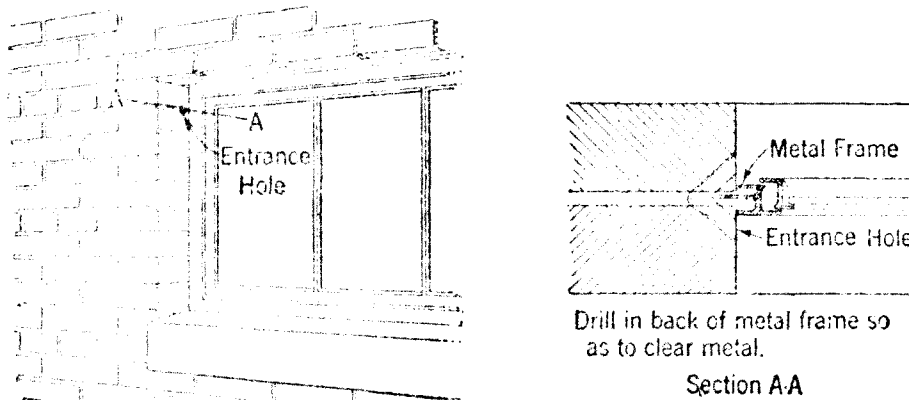
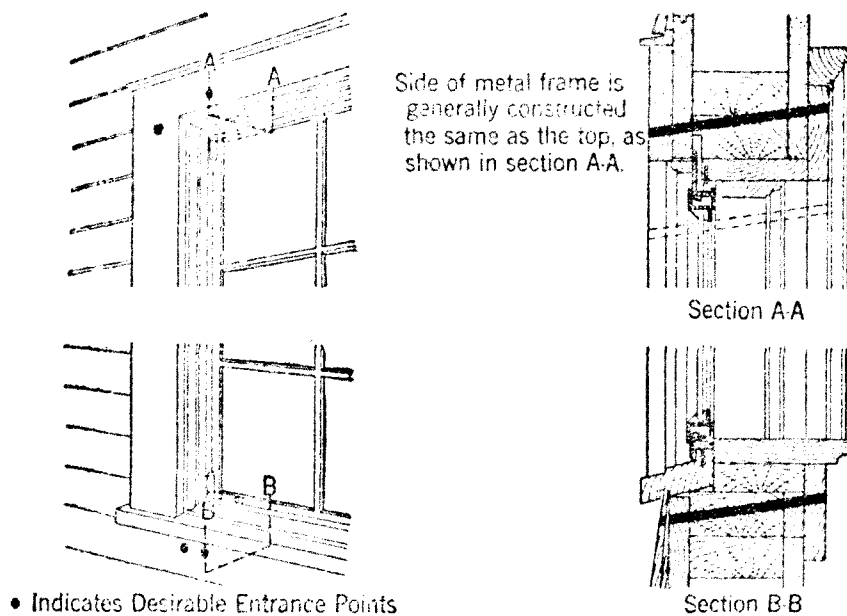


Fig. 5.

3.10 **Frame Set in Wood:** Make entrance holes at metal window frames set in wood as shown in the following typical illustration:



• Indicates Desirable Entrance Points

Fig. 6.

Wood Door Frames

3.11 Make entrance hole in wood door frame as shown for wood window frames.

Metal Door Frames

3.12 Do not make entrance holes through metal door frames. On the other hand, to enter in back of such a frame would, in general, necessitate drilling through the full width of the wall. Therefore, if possible select a more practicable point of entrance.

Overhead Service Conduit Entrances

3.13 The following illustrations show typical installations of overhead service conduit entrances.

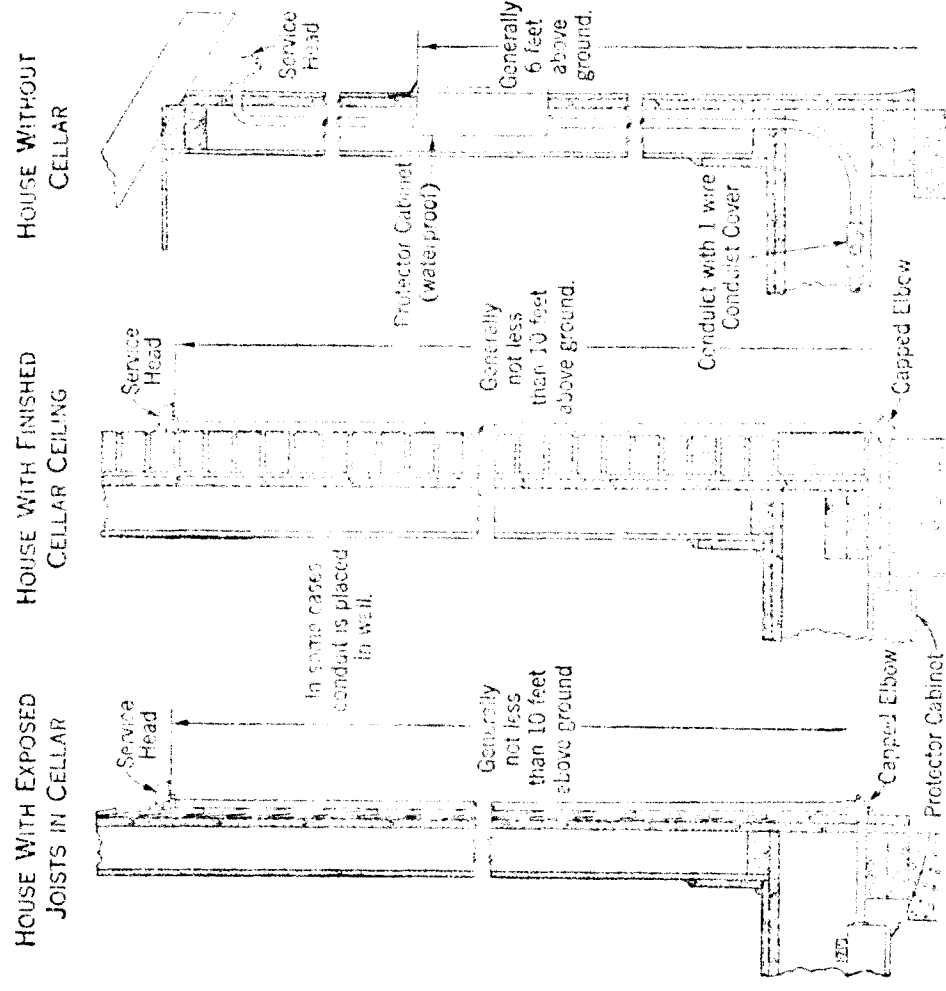


Fig. 7.

3.14 The installation of service conduits should have been made by the owner in accordance with the rules and regulations of the "National Electrical Code" (Rules and Regu-

lations of the National Board of Fire Underwriters) and any supplemental local rules and regulations. In this connection, service conduits must be grounded and the upper end must be protected by an approved service head. If from a service standpoint such an entrance does not appear to be satisfactory, consult your supervisor with a view toward either having the service entrance made satisfactory or selecting another point of entrance.

4. SIZE OF ENTRANCE HOLES

4.01 In general, the diameter of entrance holes should not be greater than one-half the width of the material through which hole is made. If necessary, make several entrance holes of smaller diameter.

4.02 Where it is desired to enter window frame below pulley, make hole preferably not more than three inches above sill (see Fig. 2). This hole must not be more than 3/8 inch in diameter. If necessary, make several entrance holes.

4.03 The following tables show the capacity of entrance holes and the size of holes to make where porcelain tubes are required:

Porcelain Tube Not Required

TYPE OF WIRE	ULTIMATE NUMBER OF WIRES			
	3/8 inch Hole	1/2 inch Hole	3/4 inch Hole	1 inch Hole
Bridle.....	2	3	7	13
BP or CP Drop (See Note 1)...	2	3	6	11
BR or CR Drop (See Note 2)...	1	2	4	7
HC Drop (See Note 3).....	1	1	2	4

Porcelain Tube Required

TYPE OF WIRE	ULTIMATE NUMBER OF WIRES		
	3/8 inch Tube (3/4 inch Hole)	3/4 inch Tube (1 1/4 inch Hole)	1 inch Tube (1 1/2 inch Hole)
Bridle.....	2	7	13
BP or CP Drop (See Note 1).....	2	6	11
BR or CR Drop (See Note 2).....	1	4	7
HC Drop (See Note 3).....	1	2	4

Note 1: BP and CP drop wires have, respectively, bronze and copper parallel conductors.

Note 2: BR and CR drop wires have, respectively, bronze and copper parallel conductors with resistant braid.

Note 3: HC drop wire has hard-drawn copper twisted conductors.

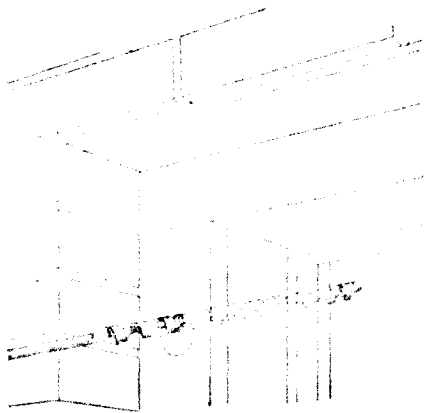
5. MAKING ENTRANCE HOLES

5.01 Entrance holes should slope upward from the outside wherever practicable. Where it is necessary to enter through a brick wall, however, make hole in a seam.

5.02 Where practicable, start hole from side where good appearance is most desirable. Exercise care in boring wood window or door frames that are very narrow and liable to split. Clean hole occasionally, especially in unseasoned or damp wood.

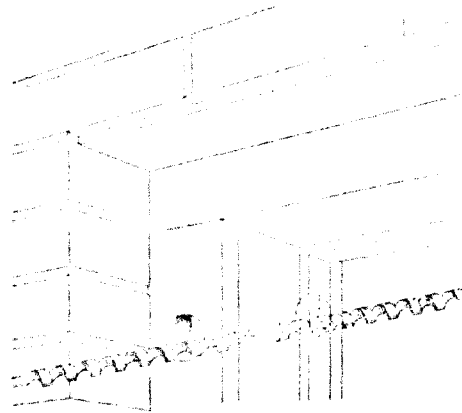
5.03 Where it is necessary to make an entrance hole through a hollow wood frame (box type) for a $\frac{3}{4}$ inch or 1 inch porcelain tube and a 1- $\frac{1}{4}$ inch or 1- $\frac{1}{2}$ inch bit or a suitable expansive bit is not readily available, proceed as follows:

METHOD FOR $\frac{3}{4}$ INCH TUBES



Use tube as a template and mark a circle at point where hole is to be cut. Bore hole inside of and touching circle, as shown. Slope hole upward from the outside. Bore through the opposite side. Mark another circle on this opposite side. Saw remaining wood away on both sides, using a keyhole saw or compass saw.

METHOD FOR 1 INCH TUBES



Bore one hole completely through as for $\frac{3}{4}$ in. tube. Then bore a second hole as shown, through one side only. Mark a circle on other side of frame and bore a second hole. Finish hole by sawing remaining wood away on both sides of frame.

Fig. 8.

6. PLACING PORCELAIN TUBES

6.01 Where porcelain tubes are required, place them as shown in the following figure:

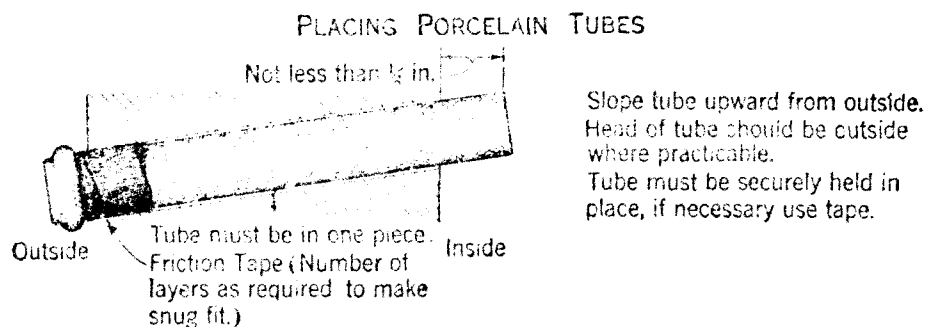


Fig. 9.

6.02 In locations where appearance is important, cut off any projection of $3/8$ inch tubes beyond one inch as shown in Fig. 10. In locations where appearance is not important, tube need not be cut unless exposed portion is subject to breakage. As it is impracticable to cut $3/4$ inch or 1 inch tubes, select length that will give least projection over $1/4$ inch.

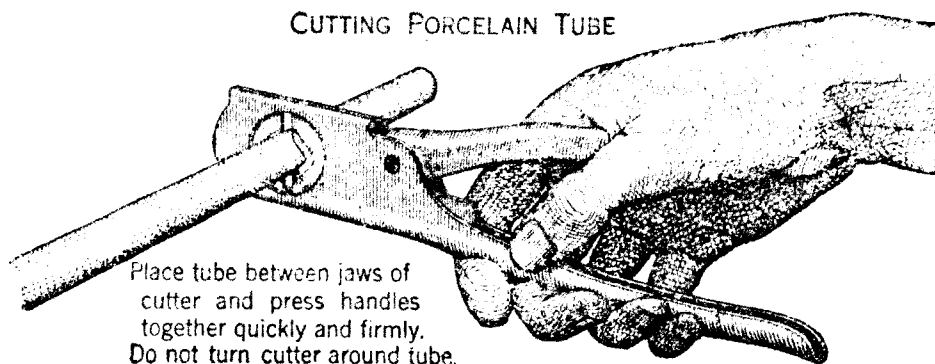


Fig. 10.