

## CONDUIT, UNDERFLOOR DUCT, AND FITTINGS

### IDENTIFICATION, PLACING WIRE AND CABLE

#### 1. GENERAL

**1.01** This section covers the placement and capacity of wire and cable in floor or wall imbedded conduit and underfloor duct systems. Information for installing connecting blocks in typical fittings is also given.

**1.02** This section is reissued to add D Station Wire and to show that JKT Station Wire is rated MD. Since this reissue is a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.03** Generally, conduit is metal or nonmetallic tubing of various diameters having a circular cross-section. Duct is metal or nonmetallic tubing of various sizes having a rectangular cross-section. It is the customers responsibility to provide adequate conduit and duct systems with outlets.

**1.04** For the purposes of this practice, reference to conduit includes underfloor duct unless specifically indicated otherwise.

#### 2. IDENTIFICATION OF TYPICAL SYSTEMS

##### UNDERFLOOR-FROM-WALL CONDUIT (Fig. 1).

**2.01** This system consists of a network of round metal tubing extending from distributing terminal cabinets or splicing closets under the floor to walls or columns of the building, or to outlets placed in the floor at the time of installation.

**2.02** Normally, new outlets or runs cannot be added to this type conduit system. Overfloor duct or baseboard raceway can be used to extend this system, if desired. See sections covering overfloor duct and metal raceways.

##### UNDERFLOOR DUCT

**2.03** There are several types of metal and fiber underfloor duct systems. They may be gridwork or cellular in pattern.

**2.04** The gridwork system (Fig. 2) consists of a series of parallel branch ducts with junction boxes at the intersection of cross ducts. An outlet provided with a removable cap will be found in the floor every 24 inches.

**2.05** Duct material of the gridwork system may be either metal or fiber. New outlets consisting of floor inserts or standpipes may be placed anywhere along the fiber duct by penetrating the floor and duct at the desired point.

**2.06** The cellular underfloor duct system (Fig. 3) consists of cell centers which are 6 inches apart. A header duct crosses the cells and connects to a distribution terminal cabinet. Junction boxes, located in the header duct, provide access to the system wiring.

**2.07** Outlets or standpipes may be provided by the builder at practically any point along the cells. Services other than telephone may be included in the cellular duct system. If one or more service is included along with telephone wiring, telephone cabling will appear in alternating cells every 12, 18, or 24 inches apart.

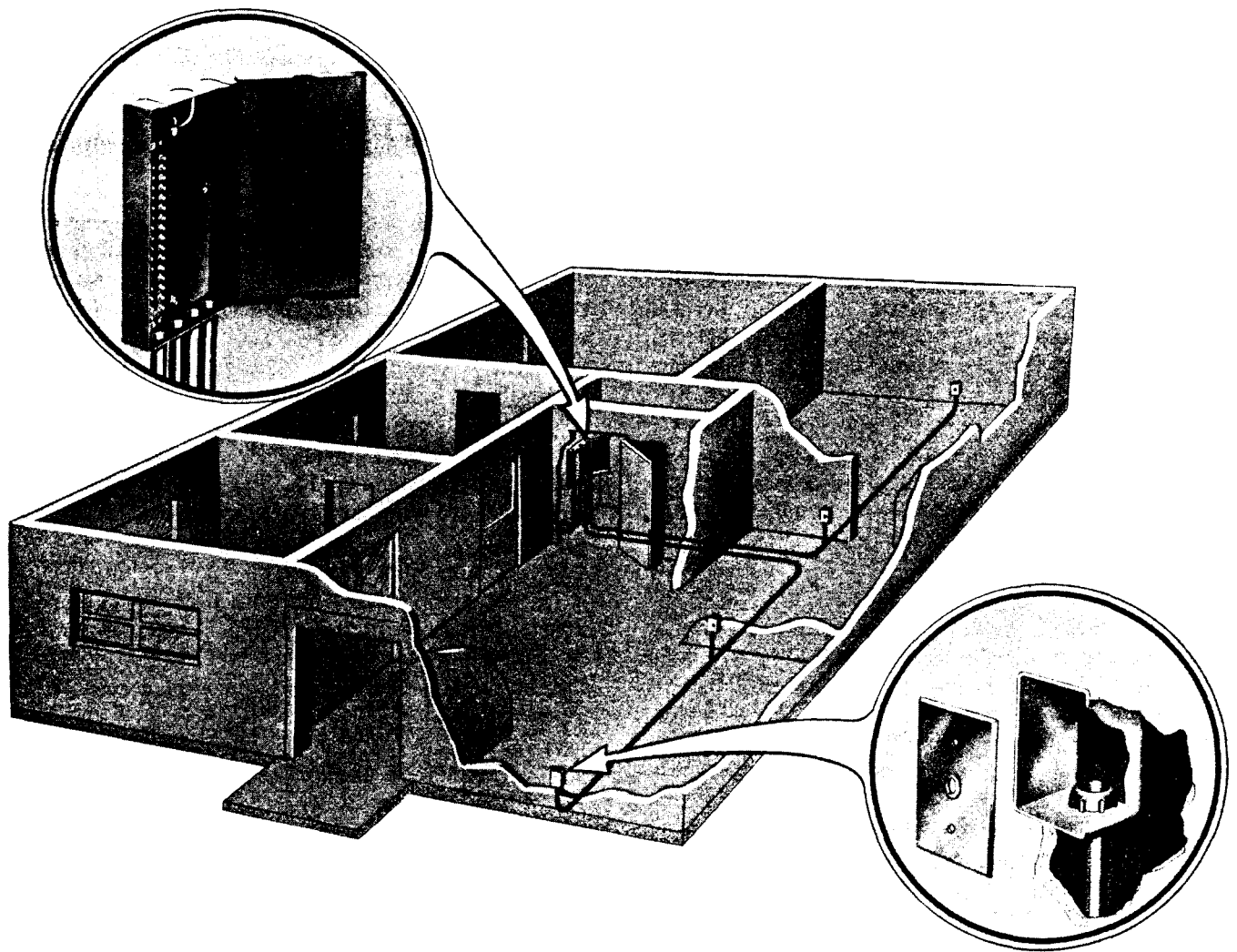
#### 3. CAPACITY OF CONDUIT

**3.01** The capacities of various sized conduit are listed in Tables A and B. Capacities are not necessarily recommended uses in all cases, due to length of runs, bends, etc.

#### 4. PLACING WIRE OR CABLE IN CONDUIT SYSTEM

**4.01** Before placing telephone wiring in conduit or underfloor duct systems secure a layout of the system from the building owner or contractor, if possible, and observe the following:

- Telephone wire or cables shall *never* be placed in conduit or duct containing electric light or power lines.
- Conduit should be checked for dampness.
- Allow for future growth of system.



**Fig. 1—Typical Underfloor-from-Wall Conduit System**

**4.02** Survey the job prior to installing telephone service. In systems containing JKT (MD) or GS Station Wire, consider replacing existing wiring with D Station Wire if difficulty is experienced in pulling new wire through crowded conduit.

**4.03** Use fish wire to facilitate fishing conduit. Use of lubricants in fishing conduits is not recommended.

## **5. CONDUIT FITTINGS**

**5.01** Various fittings and accessories are available for use in terminating telephone wiring in conduit and underfloor duct systems. Fittings are normally furnished by the builder as part of the

system, although new fittings may be required as replacements or additions.

**5.02** The Nepcoduct 7906-LC4 outlet (Fig. 4) consists of a base, hinged mounting plate, and cover and is used to house four 44-type connecting blocks.

**5.03** The base is mounted to the conduit system by means of a threaded bushing and duct fitting. The cover is secured to the base by two mounting screws.

**5.04** A bushing in one end of the cover provides an outlet for inside wiring or telephone set mounting cord.

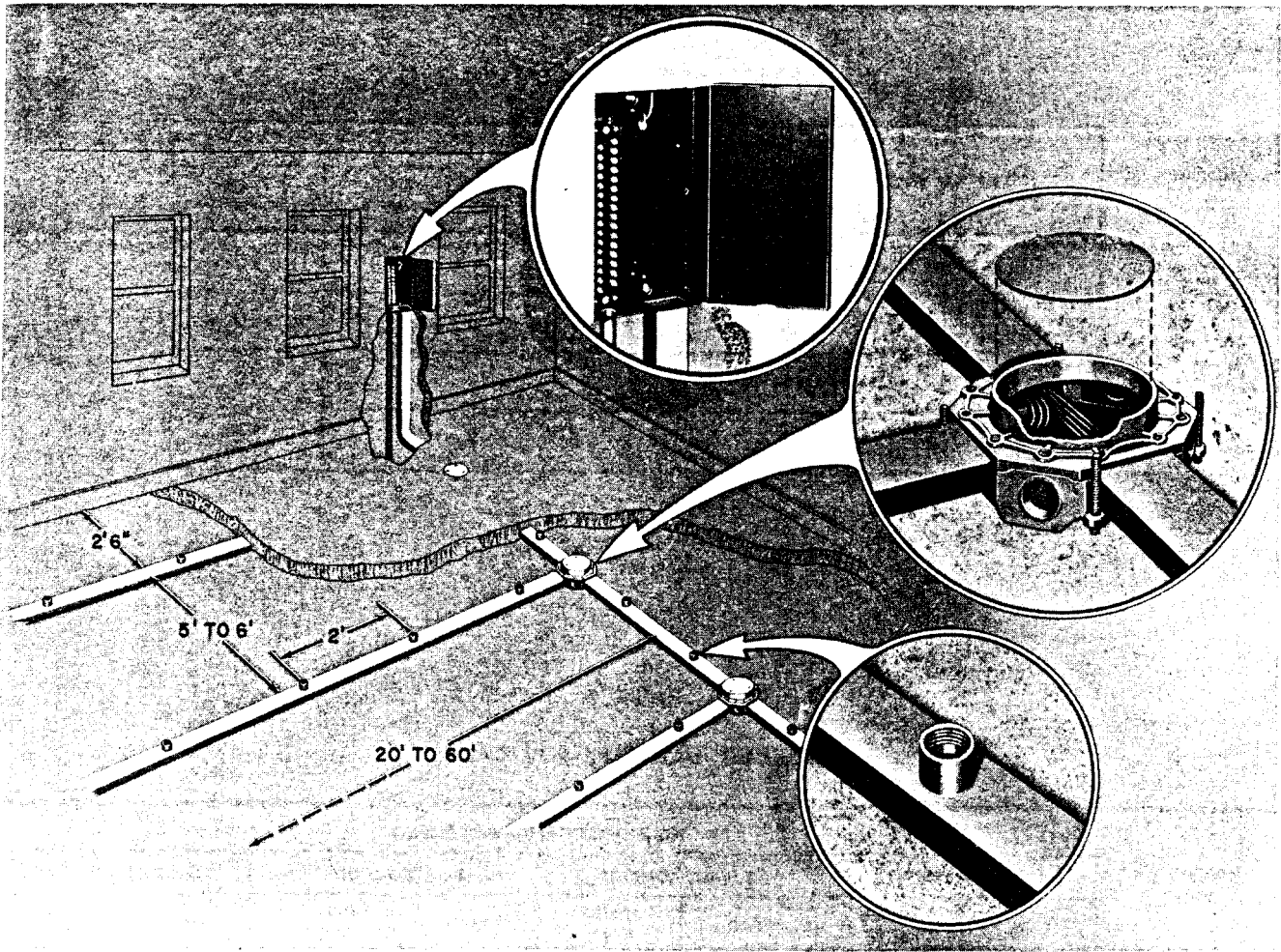


Fig. 2—Gridwork Underfloor Duct System

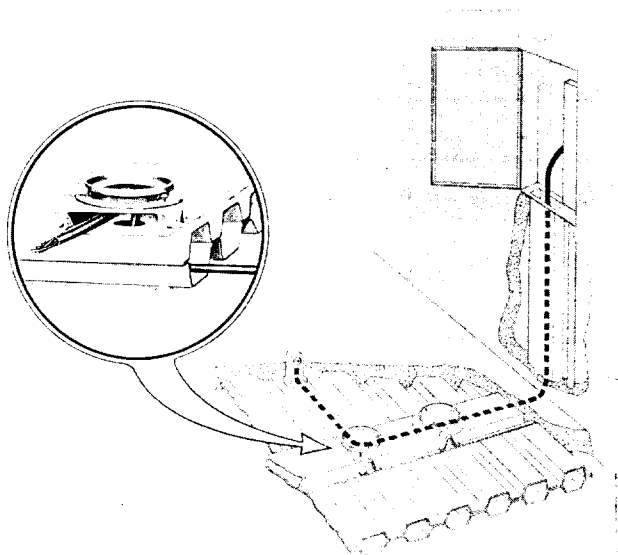


Fig. 3—Cellular Underfloor Duct System

5.05 Terminate the Nepcoduct 7906-LC4 outlet as follows:

- (1) Remove cover. Swing connecting block mounting plate upward and slip it from the hinge pins.
- (2) Mount four 44-type connecting blocks (two on either side) to the mounting plate.
- (3) Fish cable through conduit to outlet. Pull through enough slack to provide working room.
- (4) Place the end of the station mounting cord through the bushing on the cover and slip the cover up the cord.
- (5) Place the mounting plate on the hinge pins and while in a raised position, terminate the lower connecting blocks. Lower the mounting

**TABLE A**  
**CONDUIT CAPACITY FOR STATION WIRE**

TYPE OF WIRE		NUMBER OF WIRES IN CONDUIT			
		1/2-IN. CONDUIT	3/4-IN. CONDUIT	1-IN. CONDUIT	1-1/4-IN. CONDUIT
JKT (MD) STATION	Paired	2	4	7	10
	Triple	2	4	7	10
	Quad	2	4	7	10
D STATION		5	10	20	30

**TABLE B**  
**CONDUIT CAPACITY FOR CABLE**

NUMBER OF PAIRS	NUMBER OF CABLES IN CONDUIT							
	1/2-IN. CONDUIT		3/4-IN. CONDUIT		1-IN. CONDUIT		1-1/4-IN. CONDUIT	
	LEAD	INSIDE WIRE	LEAD	INSIDE WIRE	LEAD	INSIDE WIRE	LEAD	INSIDE WIRE
6	1	1	1	1	2	2	3	3
12				1		2		3
16			1	1	1	1	2	2
21			1	1	1	1	2	2
25				1		1		2
50						1		1
75								1*
100								1*

\*CALL DIRECTOR® mounting cord considered same as inside wiring cable.

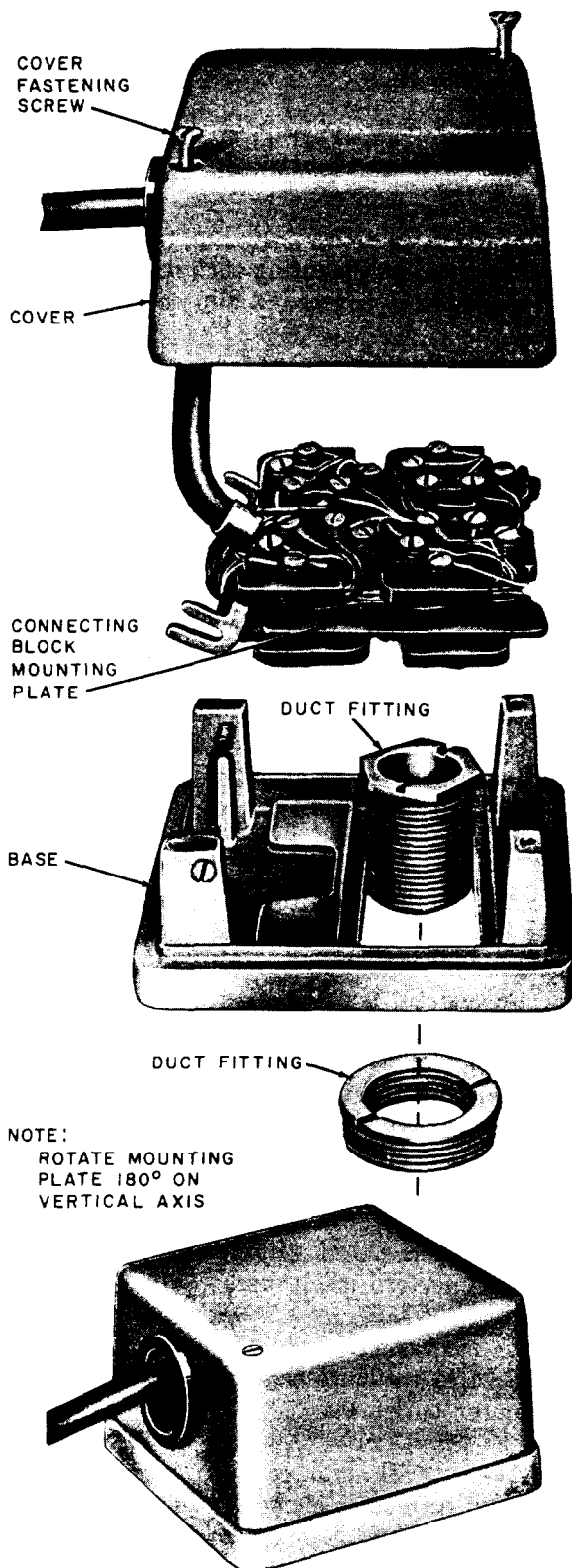


Fig. 4—Nepcoduct 7906-LC4 Outlet

plate and terminate the upper blocks. Secure the mounting cord and system cable using No. 8 cable clamps or wing band stayhooks as necessary.

(6) Dress cable slack into conduit and replace cover.

**5.06** The Nepcoduct 7906-LC outlet (Fig. 5) consists of a base, cover, and mounting plate and is similar to the 7906-LC4 except longer to provide mounting space for six 44-type connecting blocks and a 7-type or equivalent buzzer.

**5.07** Terminate this outlet as follows:

- (1) Remove cover and connecting block mounting plate.
- (2) Fish cable through conduit to outlet. Pull through enough slack to provide working room.
- (3) Mount buzzer to base in area behind hinge pin.
- (4) Install six 44-type connecting blocks (three on either side) on the connecting block mounting plate and place plate on hinge pin.
- (5) Place the free end of the telephone set mounting cord through the bushing on the cover and slip the cover up the cord.
- (6) Terminate conduit wiring, mounting cord wiring, and buzzer to connecting blocks in standard method using upper and lower blocks as required. Fasten mounting plate to base with screws provided. Use No. 8 cable clamps or equivalent to secure cabling to base and mounting plate as required.
- (7) Dress cable slack into conduit and replace cover.

**5.08** The Walker 505AL outlet (Fig. 6) consists of a base, housing, and coverplate and will accommodate up to three 44-type connecting blocks.

**5.09** Terminate this outlet as follows:

- (1) Remove coverplate and housing.

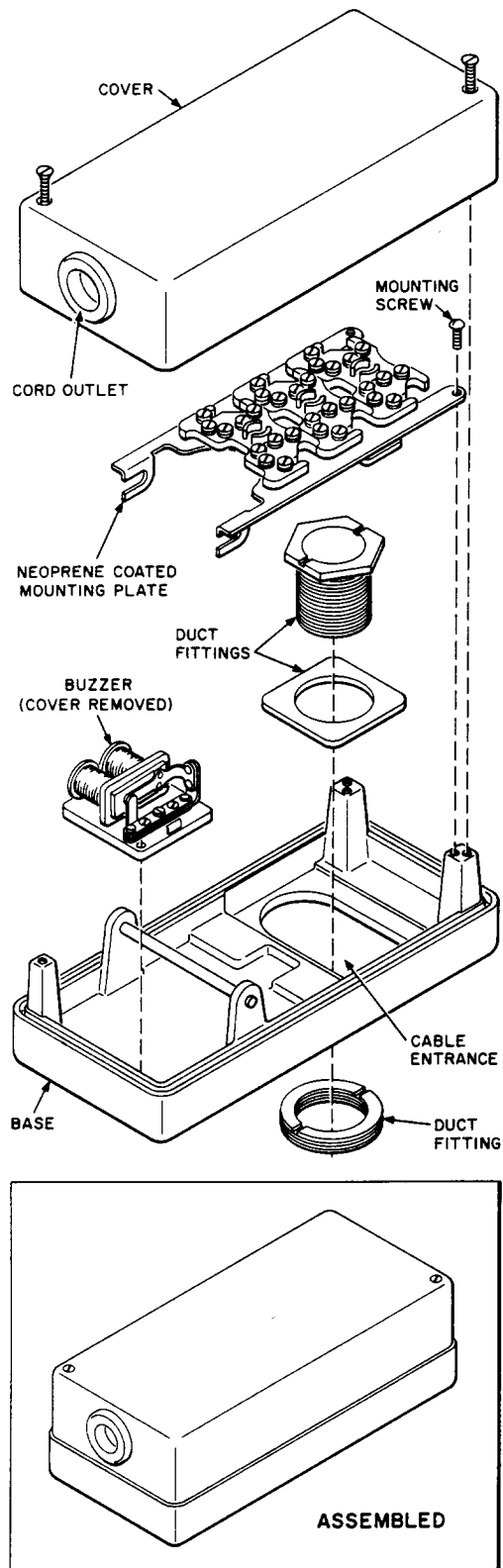


Fig. 5—Nepcoduct 7906-LC Outlet

(2) Fish the conduit cabling to the outlet, with sufficient slack to enable skinning and connecting wires.

(3) Remove connecting block mounting screws from base and mount one to three 44-type blocks as required.

(4) Place station mounting cord or cable through grommet in cover and slip cover up cable.

(5) Make connections of conduit and station cabling in normal manner.

(6) Replace cover, securing it with two screws provided.

5.10 The Walker 506AL outlet is similar in appearance to the Nepcoduct 7906-LC in Fig. 5 and provides space for mounting six 44-type connecting blocks and a 7-type or equivalent buzzer.

5.11 The Floor-Con outlet (Fig. 7) consists of a base and cover and can be used to house three 44-type connecting blocks on a 168B backboard, four 44-type connecting blocks on a 168C backboard, or KS-type connectors.

5.12 Terminate this outlet as follows:

(1) Loosen captive screw and remove cover. Lift up and tilt back of base toward the rear of the outlet.

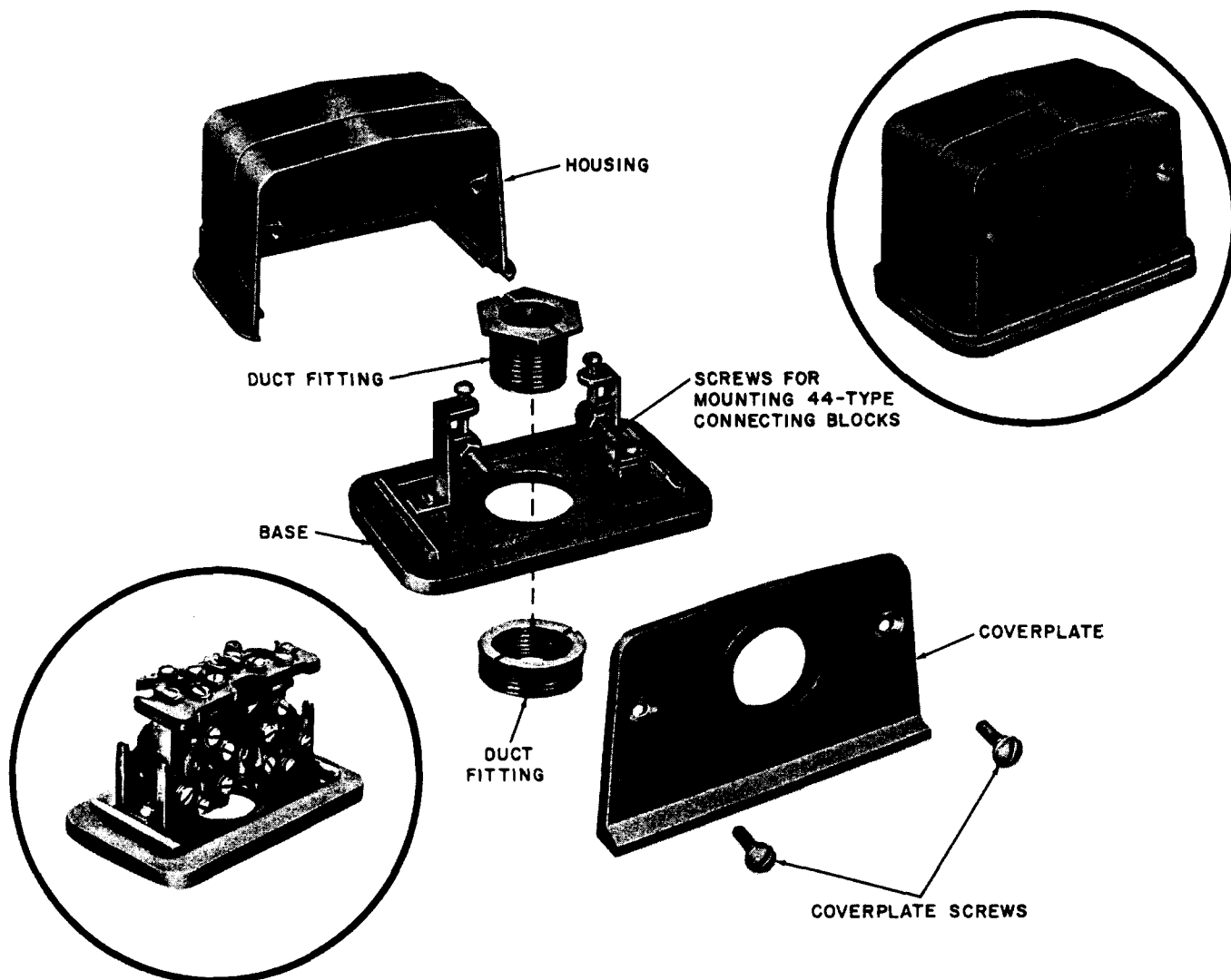
(2) Fish the conduit wiring to the outlet.

(3) If using connecting blocks, mount three 44-type on a 168B backboard or four 44-type on a 168C backboard and install backboard on the outlet base. If using KS-type connectors, place connectors inside base.

(4) Connect conduit cabling and station mounting cord in the normal manner. Mounting cord can enter outlet from either side.

(5) Dress slack into conduit, secure mounting cord with cable clamp or wing band stayhook if necessary, and replace cover.

5.13 The General Electric SP401 outlet (Fig. 8) consists of a base, housing, and two covers.



**Fig. 6—Walker 505AL Outlet**

One cover is equipped with a rubber grommet through which the station wiring is passed. This outlet can house three 44-type connecting blocks.

**5.14** Terminate this outlet as follows:

- (1) Remove front cover. Remove housing by releasing two spring catches as shown in Fig. 8 and lifting upward.
- (2) Fish conduit wiring to the outlet.
- (3) Mount one to three 44-type connecting blocks using hardware furnished with base.
- (4) Place cover on station mounting cord and connect cord and conduit wiring in standard manner.

- (5) Place housing on base and secure by pressing downward until spring catches engage. Replace cover using screws provided.

**5.15** The General Electric SP403 outlet is similar to the Npecoduct 7906-LC outlet in Fig. 5 and consists of a base, hinged mounting plate, and housing. It will accommodate six 44-type connecting blocks and a buzzer or up to ten 44-type connecting blocks without the buzzer. Grommets are provided on both sides to permit bi-directional station mounting cord entrance if desired.

**5.16** Terminate this outlet as follows:

- (1) Remove cover retaining screws and lift off housing. Loosen mounting plate locking screw and swing plate upward on its hinge.

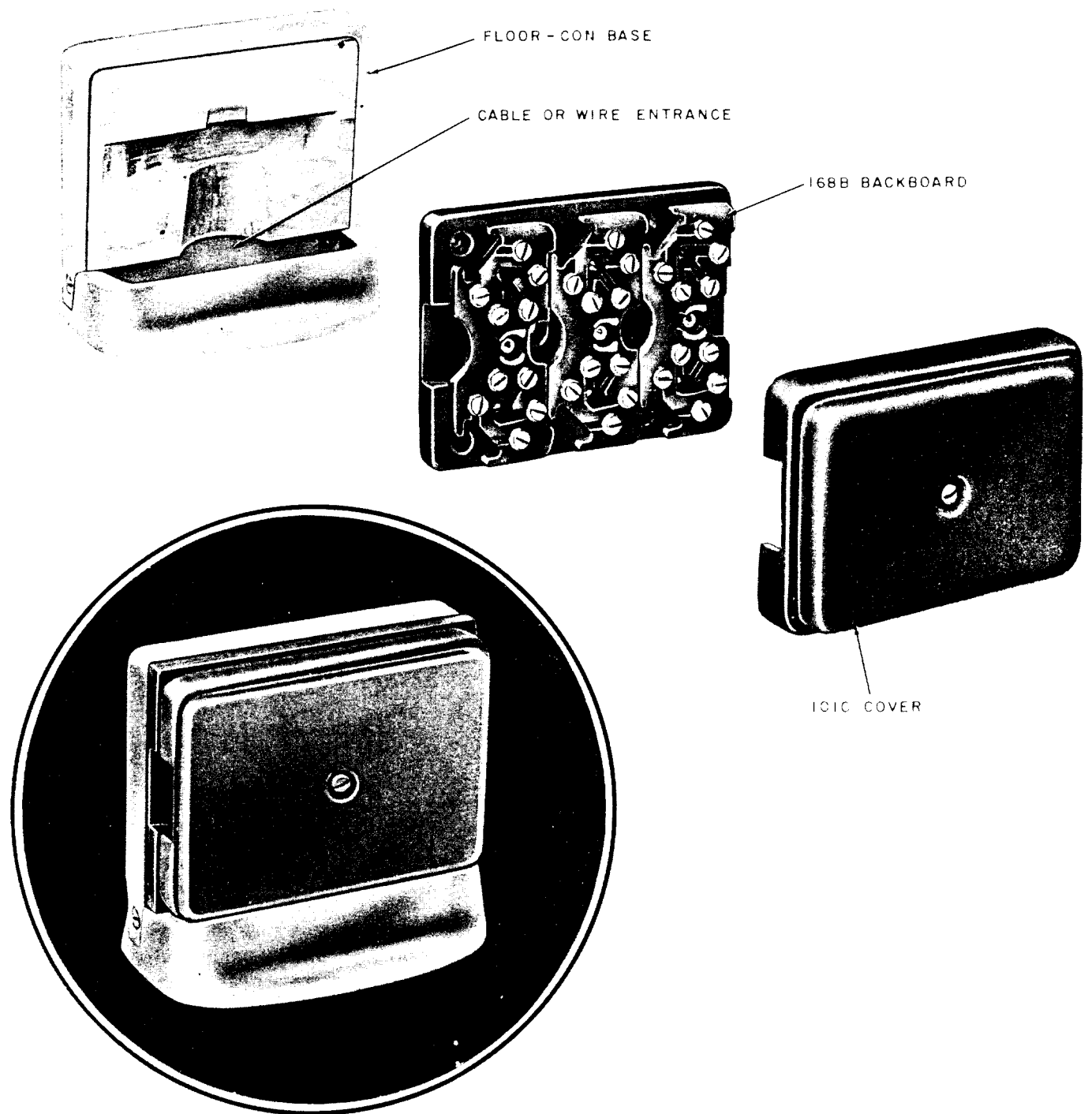
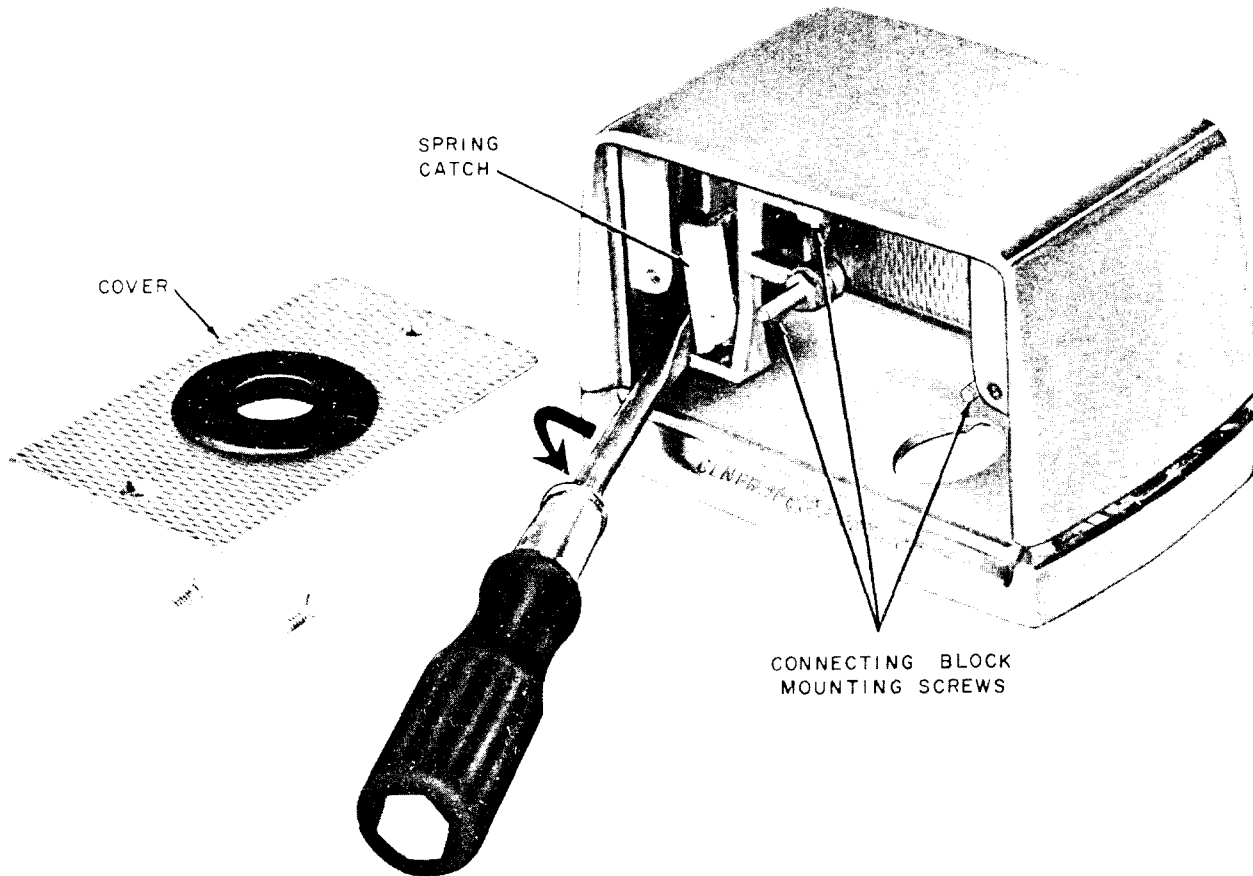


Fig. 7—Floor-Con Outlet





**Fig. 8—General Electric SP401 Outlet—Removing Housing**

- (2) Fish conduit wiring to the outlet.
  - (3) Mount 7-type or equivalent buzzer to base using tapped holes provided under mounting plate. Install six (ten if no buzzer is used) 44-type connecting blocks on the mounting plate.
  - (4) Place free end of station mounting cord through grommet on either side of base. Connect mounting cord, conduit wiring, and buzzer in standard manner. Use cable clamps, as necessary, to secure wiring.
  - (5) Lock mounting plate in place and replace housing.
- 5.17** Standard electrical outlet boxes can be used to house 47-type connecting blocks to provide for single stations at above the floor or baseboard outlets of underfloor-from-wall conduit systems similar to Fig. 1.
- 5.18** Install and terminate 47-type connecting blocks as outlined in section on connecting blocks.