

April 23, 1940.

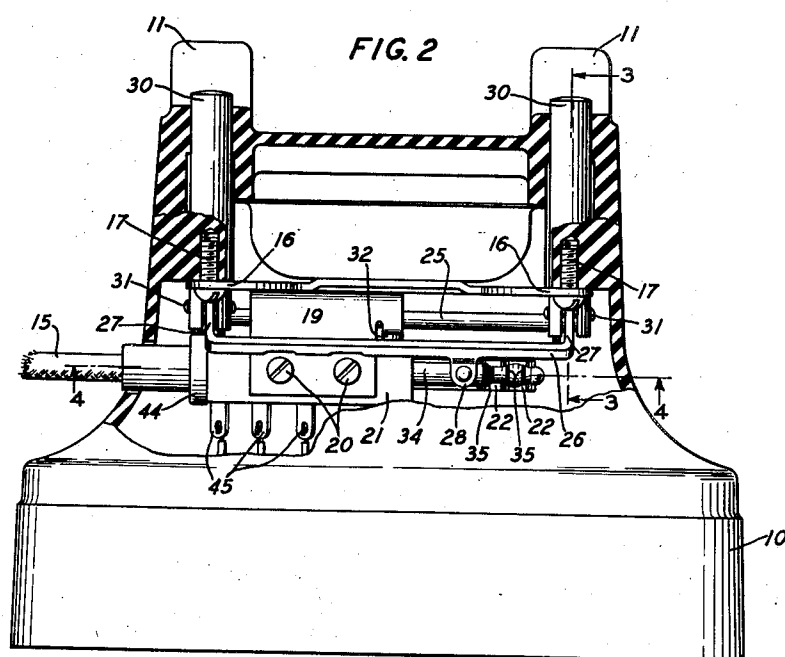
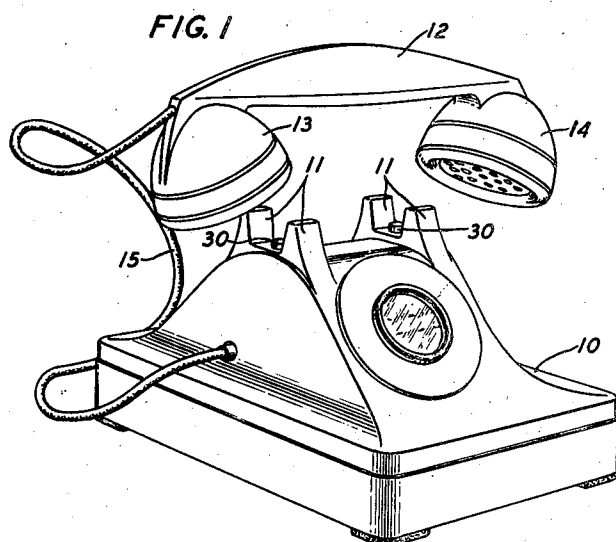
A. C. WALKER

2,197,844

TELEPHONE SUBSTATION APPARATUS

Filed Jan. 26, 1938

2 Sheets-Sheet 1



INVENTOR
A.C. WALKER
BY

Walter C. Kiesel
ATTORNEY

April 23, 1940.

A. C. WALKER

2,197,844

TELEPHONE SUBSTATION APPARATUS

Filed Jan. 26, 1938

2 Sheets-Sheet 2

FIG. 3

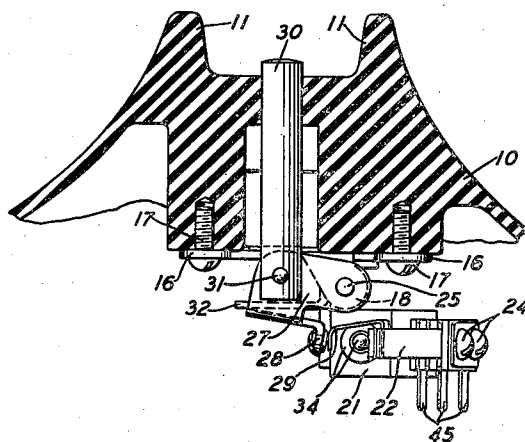


FIG. 4

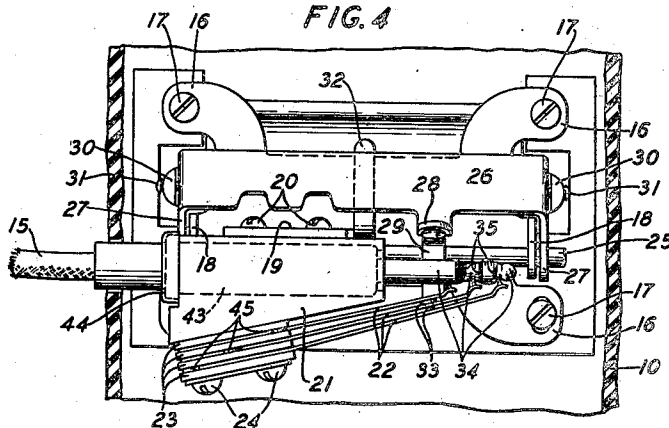
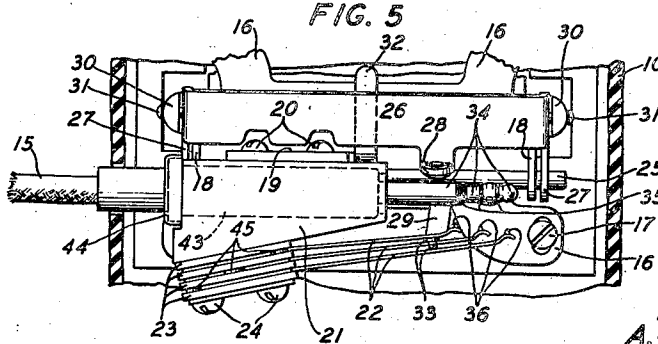


FIG. 5



INVENTOR
A.C. WALKER
BY

Walter C. Kiesel
ATTORNEY

UNITED STATES PATENT OFFICE

2,197,844

TELEPHONE SUBSTATION APPARATUS

Albert C. Walker, Short Hills, N. J., assignor to
Bell Telephone Laboratories, Incorporated, New
York, N. Y., a corporation of New York

Application January 26, 1938, Serial No. 186,961

1 Claim. (Cl. 179—100)

This invention relates to telephone substation apparatus and more particularly to mountings for hand telephones.

Telephone substation apparatus usually comprises a mounting or casing having therein various elements of a telephone subset, and a hand telephone, the instrument or instruments of which are connected in circuit with the subset elements by a cord. If proper care is not taken in the use of the telephone apparatus, this cord may become twisted or kinked.

One general object of this invention, therefore, is to prevent undesired twisting and kinking of hand telephone cords in telephone substation apparatus. More specifically, one object of this invention is to avoid undesired twisting and kinking of such cords in a facile and economic manner and without the introduction into the substation circuits of contact or circuit controlling members in addition to those normally utilized.

In one illustrative embodiment of this invention, a telephone set comprises a desk mounting having generally the usual elements of substation apparatus therein, a hand telephone, and a cord for electrically connecting the telephonic units of hand telephone in circuit with the elements within the mounting. The mounting is provided with a cradle for accommodating the hand telephone, line contact members, and a plunger for actuating the contact members in accordance with the placement of the hand telephone upon the cradle or the removal of the hand telephone from the cradle.

In accordance with one feature of this invention, the conductors of the cord are terminated at a swivel element or plug mounted so as to be freely rotatable within the mounting. The plug has a series of spaced conductive sections, each of which is adapted to make wiping contact with a corresponding one of the line contact members. Means are provided, such as the hookswitch element in the set, actuable in response to the removal of the hand telephone from the cradle, to allow firm engagement of the line contacts with the conductive sections of the plug so that an efficient and low resistance connection is established between the contacts and the conductive sections while the telephone set is in use.

The invention and the foregoing and other features thereof will be understood more clearly and fully from the following detailed description with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a telephone desk

set illustrative of one embodiment of this invention;

Fig. 2 is a front view, partly in section and partly broken away, of the mounting of the telephone set shown in Fig. 1, illustrating the association of the telephone cord, plunger, plug and line contacts, in accordance with this invention;

Fig. 3 is a fragmentary side view, partly in section, along line 3—3 of Fig. 2, further illustrating the association of the plunger, plug and line contacts;

Fig. 4 is a fragmentary plan view along line 4—4 of Fig. 2, showing the relative positions of the line contacts and the plug when the hand telephone is removed from the cradle of the mounting; and

Fig. 5 is a view similar to Fig. 4 illustrating the association of the contacts and the plug when the hand telephone is seated in the cradle of the mounting.

Referring now to the drawings, the telephone desk set shown in Fig. 1 comprises a mounting 10 having a plurality of tines 11 forming a cradle for receiving a hand telephone 12. The mounting 10 may have therein the various elements of substation apparatus, not shown, such as a condenser, induction coil and ringer. The hand telephone 12 includes a transmitter, not shown, mounted at one end 13 and a receiver, not shown, mounted at the other end 14. The transmitter and receiver are electrically associated with the substation elements through a flexible cord 15 which includes a plurality, for example three, of conductors.

Secured to the inner wall of the upper portion of the mounting, as shown in Fig. 2, is a supporting member or bracket, for example a metallic stamping, having arms 16 apertured to receive screws 17 threaded into the housing, parallel extensions or flanges 18, and an integral supporting lug or flange 19. Affixed to the lug or flange 19, as by screws 20, is a bearing block 21, for example of metal, which carries a line contact assembly including elongated contact springs 22, having integral soldering terminals 23. The springs 22 are insulated from each other by insulating spacers 23 and insulating washers 33 and, together with the spacers 23, may be affixed to the block by suitable screws 24.

The extensions or flanges 18 have extending therebetween an axle or shaft 25 on which a rocker member 26 is pivotally supported. The rocker member has parallel arms 27 through which the shaft or axle 25 extends and is pro-

vided with a projecting finger or lip 28 adapted to engage an integral extension 29 of one of the contact springs 22.

A pair of reciprocable plunger members 30 project into the cradle portion of the mounting and are secured at their inner end to the arms 27 of the rocker member, by pins 31. Rotation of the rocker member in one direction is limited by a stop or finger 32 extending from the supporting member or bracket.

A plug member 43 is rotatably fitted in a bore in the bearing block 21 and is provided with three conductive, generally cylindrical sections 34, preferably coated with a low resistance material such as silver, insulated from each other by insulating rings or collars 35. Each of the conductive sections 34 is connected electrically to a corresponding one of the conductors of the cord 15 and is adapted to be engaged by one of the contact springs 22. The plug 43 has a head 44 engaging one end of the block 21. One surface of the head 44 bears against the inner wall of the mounting 10 so that the plug is held in position. Alternatively, the head 44 may be omitted and the plug 43 held in position by other means such as a set screw extending through one wall of the bearing block 21 and having its end projecting into an annular groove in the plug. In such case, the aperture in the housing through which the cord and end of the plug pass preferably is sufficiently large to allow passage of the plug therethrough, so that the plug may be associated and dissociated readily with the bearing plug and the contact springs. If desired, the contact springs may have thereon relatively soft, low resistance contact bars 36 adapted to make wiping engagement with the conductive sections 34 of the plug.

When the hand telephone is in the cradle, the plungers 30 are depressed and actuate the rocker member 26 so that the finger or lip 28 bears against the extension 29 and moves the contact springs 22 out of engagement with the plug sections 34 as indicated in Fig. 5. Hence, the telephone set is disconnected from the telephone line. When the hand telephone is removed from the cradle, the springs 22, acting in concert through the extension 29, cause rotation of the rocker member through an arc limited by the stop 32. The contact bars 36 are brought, thereby, into firm engagement with the corresponding sections 34 of the plug, as shown in Fig. 4, so that the instruments of the hand telephone are connected to the telephone line.

Inasmuch as, as noted hereinabove, the plug 43 is freely rotatable in the bearing block 21, it can accommodate itself to any position of the cord 15 so that twisting and kinking of the cord 15 is

prevented. Such rotation of the plug in unison with the cord may occur not only when the hand telephone is in the cradle but also when the hand telephone has been removed from the cradle, inasmuch as in the latter case the springs 22 need not bear against the sections 34 with sufficient force to prevent rotation of the plug. Of course, the contact springs may be so designed that the pressures normally specified between the springs and the plug for satisfactory operation are obtained.

It will be noted that this invention provides an efficient, effective swivel connector for the cord conductors without the introduction of contacts in addition to the usual line contacts into the circuits associated with the instruments of the hand telephone so that the generation of noises in the talking and receiving circuit, occasioned by additional contacts in devices suggested heretofore, is prevented.

It may be pointed out also that because of the continual wiping action between the springs 22 and the sections 34 of the plug, clean, low resistance and efficient connections obtain.

It will be appreciated, moreover, that this invention provides a relatively simple and inexpensive contact spring and plug arrangement which may be incorporated readily in standard telephone sets.

Although a specific embodiment of the invention has been shown and described, it will be understood, of course, that this embodiment is but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined in the appended claim.

What is claimed is:

A telephone set comprising a housing having a cradle portion for accommodating a hand telephone, a reciprocable plunger extending through said housing and projecting into said cradle, a bracket member secured to an inner wall of said housing and having a pair of spaced arms and a flange, a rocker member supported by said arms and connected to said plunger, said rocker member having a projecting finger, an elongated bearing block secured to said flange and having a bore therein, a plurality of elongated contact springs fixed at one end on said bearing block and insulatively coupled adjacent the other end, one of said springs engaging said finger, a plug extending through said bore and freely rotatable therein, said plug having a plurality of collar portions insulated from one another and engageable by said springs, and a multiconductor cord connected to said collars and to the hand telephone.

ALBERT C. WALKER.