

Aug. 20, 1940.

A. TRADUP

2,212,216

TELEPHONE SET

Filed March 30, 1938

FIG. 1

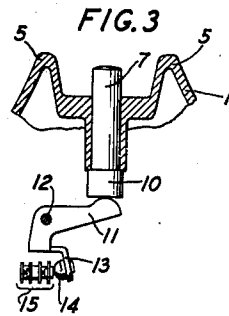
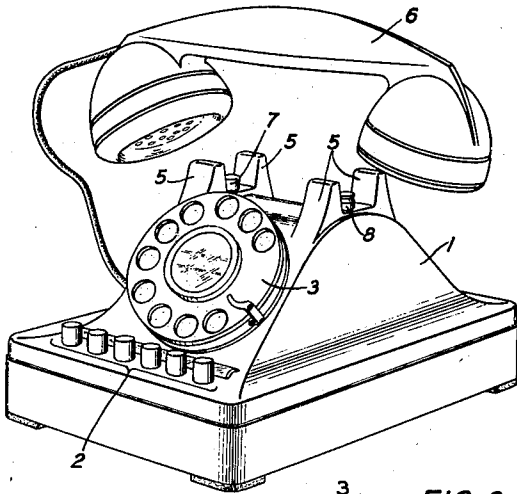


FIG. 5

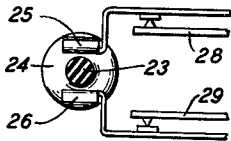


FIG. 2

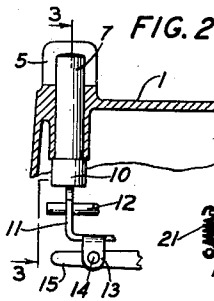


FIG. 4

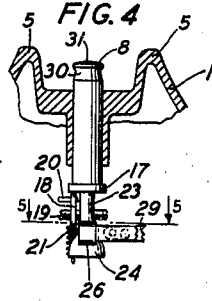
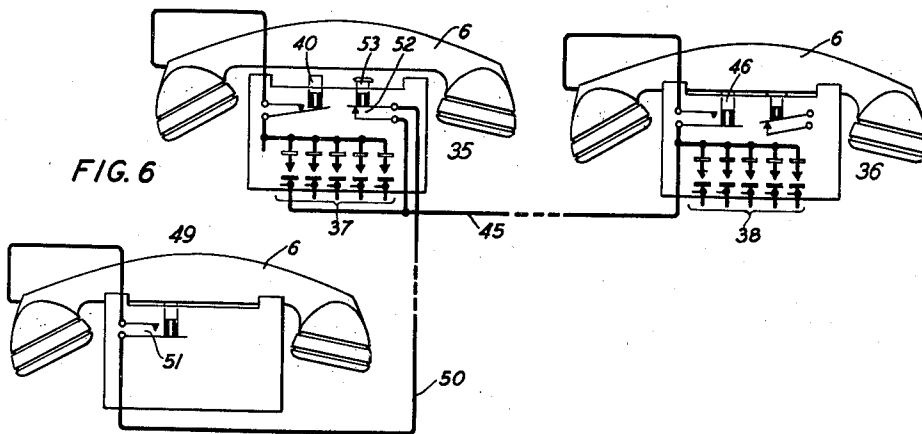


FIG. 6



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2,212,216

TELEPHONE SET

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Application March 30, 1938, Serial No. 198,819

11 Claims. (Cl. 179-99)

This invention relates to telephone apparatus and particularly to improvements in subscribers' telephone sets.

The objects of the invention are to increase the usefulness of telephone sets; to facilitate the acts required to manipulate them; to simplify their structure and operation and to secure other advantages and improvements.

It has been the practice heretofore to provide subscribers' sub-stations with means enabling them to perform certain switching operations apart from those which usually result from the removal and replacement of the telephone instrument with respect to the switchhook or cradle. For example, keys have been provided by means of which the subscriber may establish and disestablish telephone connections between his station and extension stations associated with his own line. Also, it has been common practice to provide the stations in an intercommunicating system with keys or buttons for making connections.

In accordance with a feature of the present invention advantages are obtained over these prior switching arrangements by placing the switch-operating keys or buttons directly under control of the telephone instrument. With this provision an extension station may be disconnected from the line by the manual operation of a plunger located in the cradle of the set and may be reconnected to the line automatically when the instrument is replaced in the cradle. To this end the telephone stands may be provided with two plungers in the cradle whereby the lifting of the handset from the cradle releases one plunger to operate the usual line spring contacts to connect the telephone set with the line and whereby the subsequent manual lifting or raising of the other plunger causes the operation of so-called secrecy contacts to open the extension telephone connections to secure privacy on the line calling and whereby the replacing of the handset on the cradle restores the two plungers and associated contacts to normal position. The line spring contact operating plunger may be actuated manually, after the subscriber has lifted the handset from the cradle to flash the line contacts. The copending application of Douglas A. King, Serial No. 198,825, filed March 30, 1938, shows a similar desk-stand arrangement in which after the handset is removed from the cradle, the subscriber may flash the line contacts by the operation of either plunger if the secrecy contacts have not been operated and by the operation of the line contact operating plunger only if the secrecy con-

tacts have been operated without disturbing this setting.

It will be obvious that other switching operations may be performed by the secrecy contact operating plunger. For instance, the manual lifting of this plunger may connect a normally disconnected extension station to the line so that both parties may participate in the conversation in which case the replacement of the telephone in the cradle would depress this plunger to restore the extension station to its normally disconnected condition.

The invention has been illustrated in the accompanying drawing in which:

Fig. 1 is a perspective of a desk stand for intercommunicating telephone sets provided with a dial for establishing connections to a central office, keys for establishing connections to intercommunicating lines, and a plunger equipment in accordance with the present invention;

Figs. 2, 3, 4 and 5 show the detail construction of the two plungers in the cradle and the contact arrangements controlled thereby; and

Fig. 6 shows in diagrammatic form two regular telephone stations and an extension station equipped in accordance with the applicant's invention and with the circuits of an intercommunicating line between these stations, and plunger equipment for excluding the extension station.

Referring now particularly to Fig. 1 the desk stand may consist of a base 1 on which are shown keys 2 for establishing connections between stations and a dial 3 for calling over a line to a central office. This base also is shown provided with four upwardly extending prongs 5 forming a cradle in which the handset 6 may rest when the telephone is not in use. Between the left-hand prongs 5 in this figure is shown a plunger 7 which may control the line spring contacts and between the right-hand prongs 5 is shown a plunger 8 which may control the secrecy contacts.

Referring now to the detail construction of the plungers 7 and 8 and the contacts operated thereby as shown in Figs. 2, 3 and 4, Fig. 2 is a vertical cross-section taken through the center of the cradle of Fig. 1 exposing the two plungers 7 and 8. These plungers are shown in the released position they occupy when the handset is removed. The plunger 7 is inserted in an aperture in the casing 1 and is provided with a lower shoulder 10 to limit its upward movement. This plunger 7 operates on a lever 11 pivoted on the shaft 12 secured in any suitable manner in the casing 1. Fig. 3 shows a side view of this plunger and associated contacts taken on line 3-3 of Fig. 2. This

lever has an angular extension 13 provided with an insulating knob or button 14 which operates on the line spring contacts 15 which may be supported in any suitable manner in the casing 1. When the plunger is in the position shown in Figs. 2 and 3 these contacts are closed and when the plunger is depressed by the replacing of the handset 6, the contacts 15 are opened. As shown in Fig. 3, there are two sets of line spring contacts.

The plunger 8 is also inserted in an aperture in the casing 1 and is shown in Figs. 2, 4 and 5 in the raised position that it occupies when the handset 6 has been removed from the cradle. This plunger 8 is provided with a lower shoulder 17 and is raised to the position shown by the lever 18 pressing against this shoulder. This lever is pivoted on a shaft 19 supported in any suitable manner in the casing 1 and is held against the stop 20 to raise the plunger 8 in the position shown by means of a coiled spring 21 connected at one end to an extension on the lever 18 and at the other end to a pin secured in any suitable manner in the casing 1. Fig. 4 is a cross-section taken on line 4-4 of Fig. 2 and shows a different view of these parts. The plunger 8 is provided with extension 23 which is circular in cross-section and ends in a cone-shaped portion 24 which in the position shown engages springs 25 and 26. The spring 25 operates on contact spring 28 and spring 26 operates on contact spring 29 when the plunger 8 is manually lifted above the position shown by gripping it at the point 30 where the plunger is reduced in diameter to form an upper knob 31. The cone-shaped portion 24 is thereby pressed between the springs 25 and 26 to separate them. These springs then open the connections to the contact spring 28 in one case, and 29 in the other case, as clearly shown in the enlarged cross-section in Fig. 5 taken on the line 5-5 of Fig. 4. The cone-shaped portion 24 is raised sufficiently to be held between the springs 25 and 26 until it is released by depressing the plunger 8 manually or by the replacing of the handset 6 on the cradle.

It should be noted that when the handset 6 is removed from the cradle and the plunger 7 is raised, the plunger 8 is also raised to the position shown in Figs. 2, 4 and 5 but it should be observed that in this position it does not operate the contacts 28 and 29, and it is from this position that the contacts 28 and 29 may be manually operated as described.

Fig. 6 shows desk stands, as described above, employed in an intercommunicating telephone system. A single line arranged for two regular sets and an extension station has been shown. It should be observed, however, that this line and its connecting contact equipment has only been shown diagrammatically to merely illustrate the general principles of the connection facilities that may be used in connection with the applicant's invention. A description will now be made of the operation of this system. 35 and 36 are regular telephone sets equipped with keys 37 and 38, respectively. The operation of any one of these will select a corresponding line and the removal of the handset 6 will complete the telephone circuit from the calling subscriber's set to the selected line. For example, if the subscriber at station 35 removes his handset 6 from the cradle, his plunger 40, corresponding to plunger 7, will be raised, as described, and close a connection for the transmitter and receiver in the handset to the keys 37. Then, the subscriber may operate,

for example, the left-hand key and close this telephone line connection to the line 45 which may be the line leading to station 36 and suitable circuits may be provided as is well known in the art for ringing the called party at this station. When the subscriber at station 36 removes his handset 6 from the cradle, a connection will be completed by the raising of the plunger 46, corresponding to plunger 7 at this station. At station 35 the handset has been shown removed from the cradle with the plunger 40 raised to close the line contacts, while at station 36 the handset remains in the cradle to show how the connection to this handset is opened. An extension station 49 for station 35 has also been shown. This station is not provided with any keys for intercommunicating, but has a connection 50 which extends from this station over the line contacts 51 through contacts 52 at station 35 to line 45. It should be observed that in case the subscriber at station 49 lifts his handset from the cradle while station 35 is engaged, contacts 51 will be closed and this subscriber will be able to listen in on the conversation between the subscribers at stations 35 and 36. If, however, these subscribers require privacy, that is, if they desire to carry on conversation without having the subscriber at station 49 listening in, in case he should remove his handset 6 from the cradle, the subscriber at station 35 must operate his plunger 53, corresponding to plunger 8; by lifting it as described in connection with Figs. 2, 3, 4 and 5, this will open the contacts 52 corresponding to contacts 25, 28, 26 and 29, and thus break the connections between lines 45 and 50 and prevent the subscriber at station 49 from listening in. Should the subscriber at station 35 desire to permit the subscriber at station 49 to listen in, he merely depresses the plunger 53 to again close the connection through contacts 52.

While this invention has been illustrated in connection with intercommunicating systems it should be understood that it may be equally well applied to any other telephone systems without departing from the spirit thereof.

What is claimed is:

1. In combination, regular telephone stations comprising a telephone handset and a desk stand, telephone lines connecting said stations, extension stations having certain of said lines connected thereto, line connecting contacts in said desk stands for connecting the associated telephone handsets with any telephone line, extension contacts in said desk stands for disconnecting the extension stations from said regular stations, means in said desk stand automatically movable in response to the removal of the handset from the desk stand for actuating the line connecting contacts and manually movable after the removal of the handset for restoring said line connecting contacts and means in said desk stand independent of said first-mentioned means, automatically movable in response to the removal of the handset to enable further manual movement for actuating said extension contacts and to enable the release of said extension contacts in response to the replacing of the handset.

2. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contacts mounted in said stand, a reciprocating plunger in said cradle movable under control of the handset and also manually movable after the handset has been removed for actuating said contacts, a second set of contacts mounted in said stand and a

second reciprocating plunger mounted in said cradle independently of the first plunger which is automatically movable in response to the removal of the handset to enable the actuation of said second set of contacts by manual movement of the plunger and to enable the return of said second set of contacts by an automatic movement operative in response to the replacing of the handset.

3. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contact springs mounted in said stand, a plunger in said cradle normally held in one position by the weight of said handset to maintain said springs in their normal positions and movable to an operated position upon the removal of the handset to cause the operation of said springs, a second set of contact springs mounted in said stand and a second plunger in said cradle which is held in normal position by said handset and is movable to a first operated position upon the removal of the handset and which is thereafter movable manually to a further operated position to actuate the springs of said second set.

4. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contact springs mounted in said stand, a plunger in said cradle normally held in one position by the weight of said handset to maintain said springs in their normal positions and movable to an operated position upon the removal of the handset to cause the operation of said springs, a second plunger in said cradle movable to a first operated position upon removal of said handset and movable manually from said first operated position to a second operated position and which is restored from either operated position to a normal position by the replacement of the handset, and a second set of contact springs actuated by said second plunger in its second operated position.

5. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contact springs mounted in said stand, a plunger in said cradle normally held in one position by the weight of said handset to maintain said springs in their normal positions and movable to an operated position upon the removal of the handset to cause the operation of said springs, a second plunger in said cradle having a normal position and two operated positions, resilient means for moving said plunger to its first operated position when the handset is removed, said plunger being movable manually from its first to its second operated position while the handset is removed and movable from either operated position to normal by the replacement of said handset and a second set of contact springs actuated by said second plunger in its second operated position.

6. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contact springs mounted in said stand, a plunger in said cradle normally held in one position by the weight of said handset to maintain said springs in their normal positions and movable to an operated position upon the removal of the handset to cause the operation of said springs, a second set of contact springs mounted in said stand, a second plunger in said cradle having a normal position and two operated positions, resilient means for moving said plunger to its first operated position when the handset is removed, said plunger being movable manually from its first to

its second operated position while the handset is removed and movable from either operated position to normal by the replacement of said handset and a second set of contact springs actuated by said second plunger when moved into its second operated position and cooperating therewith to hold it in said second position.

7. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contact springs mounted in said stand, a plunger in said cradle normally held in one position by the weight of said handset to maintain said springs in their normal positions and movable to an operated position upon the removal of the handset to cause the operation of said springs, a second plunger in said cradle having a normal position and two operated positions, resilient means for moving said plunger to its first operated position when the handset is removed, said plunger being movable manually from its first to its second operated position while the handset is removed and movable from either operated position to normal by the replacement of said handset and a second set of contact springs unaffected by said second plunger in its normal and first operated positions and actuated by said plunger in its second operated position.

8. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contact springs mounted in said stand, a plunger in said cradle normally held in one position by the weight of said handset to maintain said springs in their normal positions and movable to an operated position upon the removal of the handset to cause the operation of said springs, a second plunger in said cradle having a normal position and two operated positions, resilient means for moving said plunger to its first operated position when the handset is removed, said plunger being movable manually from its first to its second operated position while the handset is removed and movable from either operated position to normal by the replacement of said handset, and a second set of contact springs actuated by said second plunger in its second operated position and circuit means controlled by both of said sets of contact springs.

9. A handset, a stand for said set, two sets of contacts in said stand, a plunger for each set of contacts, means in said stand for raising one of said plungers operative when the handset is removed from the stand, means operative in response to the raising of said plunger for operating one of said sets of contacts, means in said stand for raising the other plunger operated when the handset is removed from the stand, means operative on the further manual raising of said second plunger for operating said second set of contacts, said means being so arranged that the lowering of said plungers to their normal positions by the replacing of the handset on the stand causes the release of said two sets of contacts.

10. A handset, a stand for said handset, two sets of contacts in said stand, two independently operated plungers in said stand, means including a lever associated with one plunger and one set of contacts operative in response to the removal of the handset from the stand to raise the associated plunger and operate the associated set of contacts, means for raising the second plunger in response to the removal of the handset from the stand to permit the further raising of said second plunger manually, and means associated

with said second plunger for operating said other set of contacts when said plunger is manually raised, said plungers and said means being so arranged that the replacing of the handset on the stand will restore both of the plungers to normal position and release said sets of contacts.

11. In combination, a telephone handset, a stand therefor having a cradle member in which the handset normally rests, a set of contacts mounted in said stand, a reciprocating plunger in said cradle movable under control of said handset and also manually movable after the handset has been removed for actuating said con-

tacts, a second reciprocating plunger in said cradle having a normal position and two operated positions, said second plunger being movable to its first operated position when the handset is removed from the cradle and movable manually from its first to its second operated position while the handset is removed, and a second set of contacts actuated by said second plunger in its second operated position, said second plunger being movable either manually or by the replacing of the handset in the cradle from either operated position to normal position.

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