April 6, 1948. H. F. OBERGFELL 2,439,218

TELEPHONE SUBSTATION SET

Filed May 13, 1944 3 Sheets-Sheet 1

FIG. 2

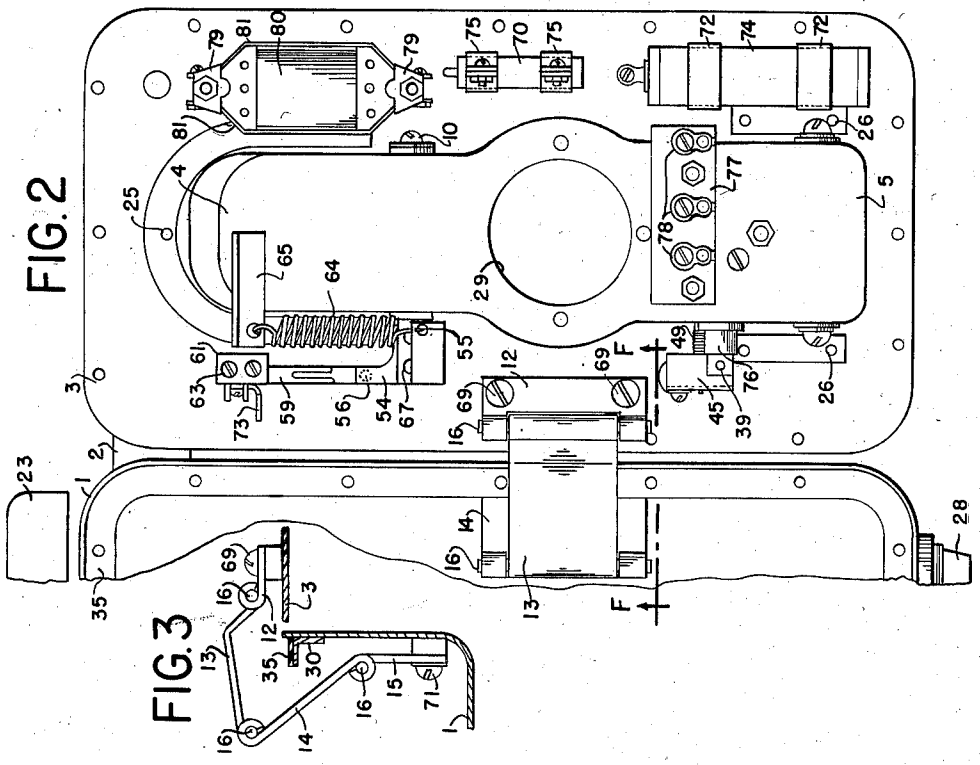
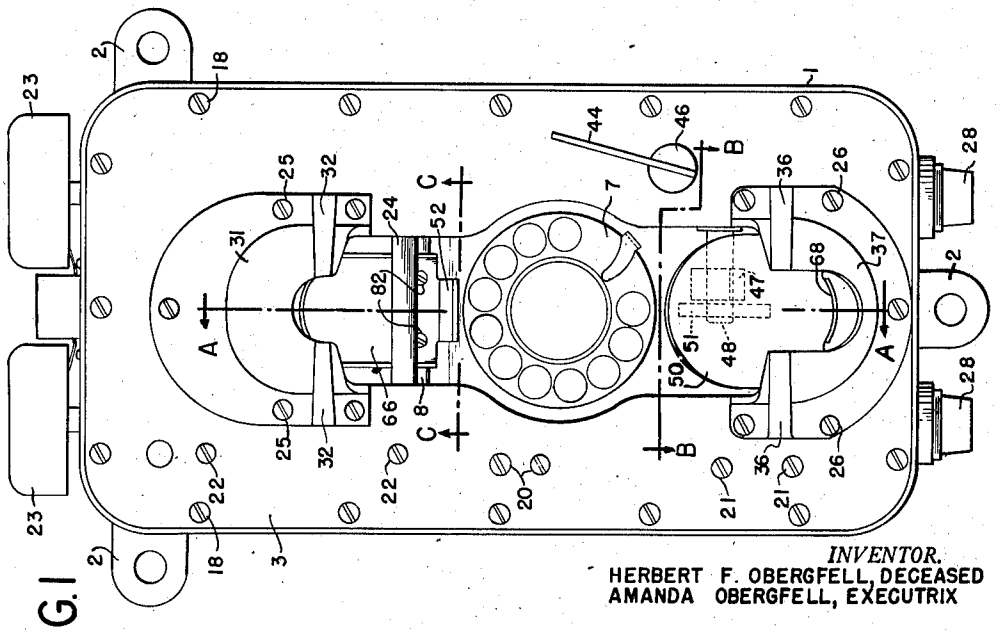


FIG. 3

FIG. 1



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TELEPHONE SUBSTATION SET

Filed May 13, 1944 3 Sheets-Sheet 2

FIG. 6

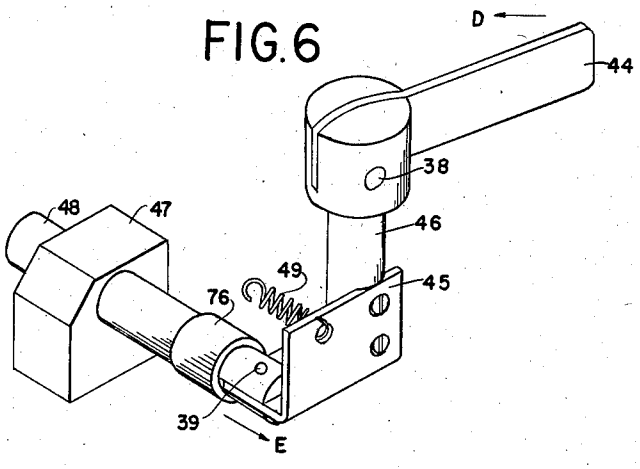


FIG. 4

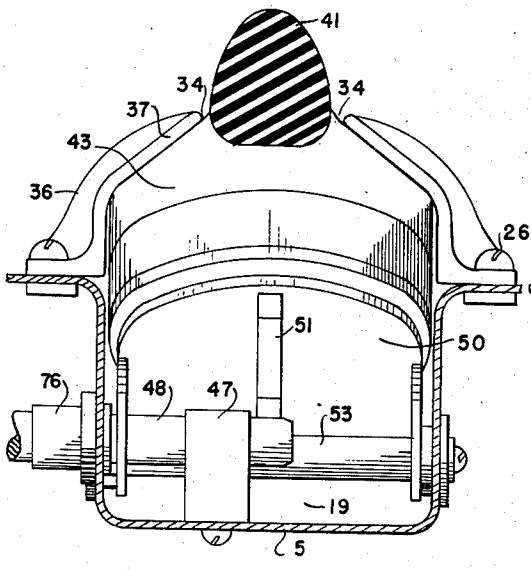
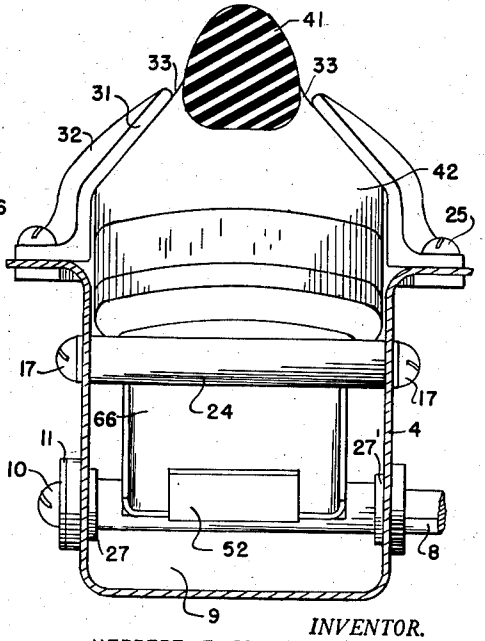


FIG. 5



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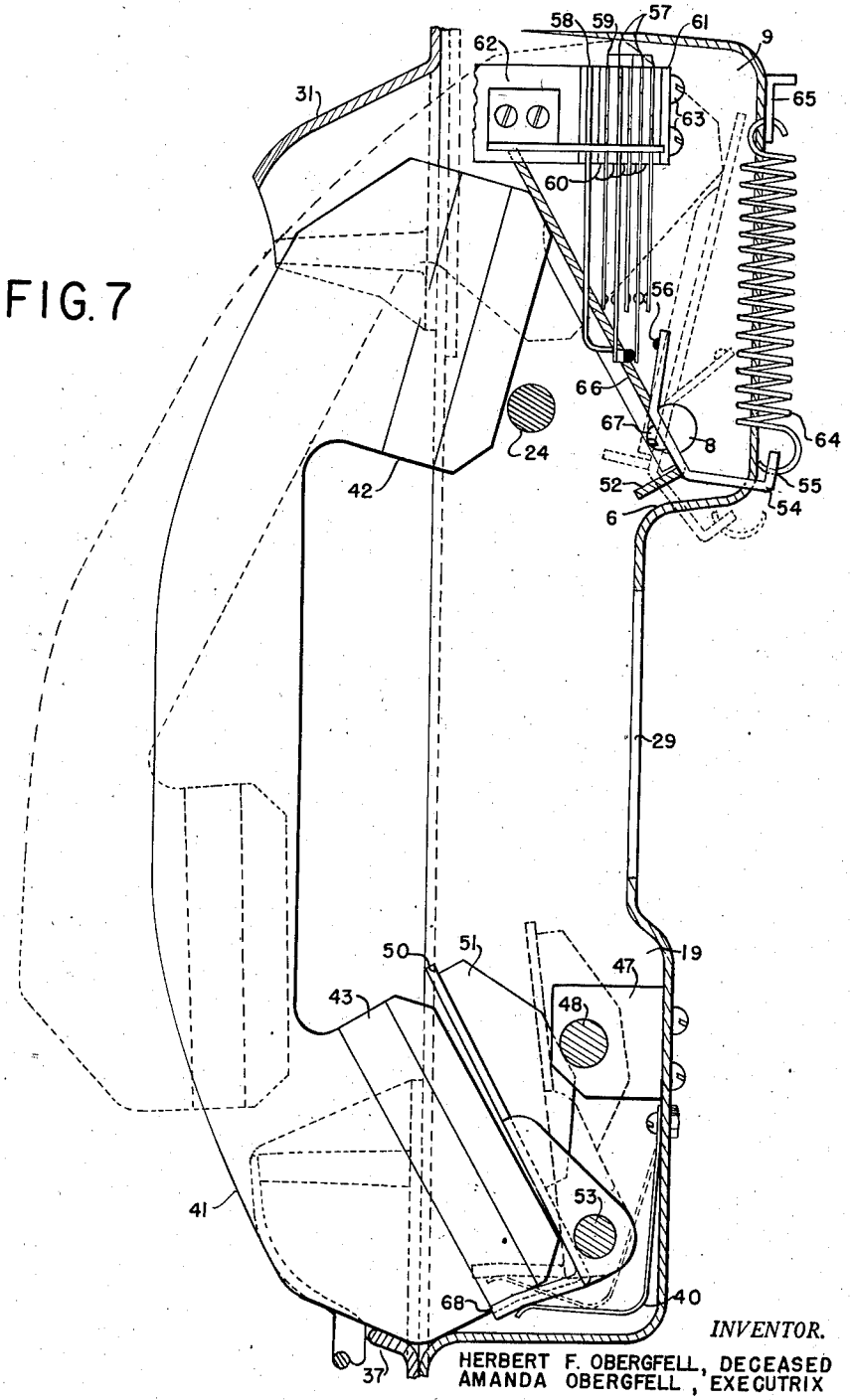
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April 6, 1948. H. F. OBERGFELL 2,439,218

TELEPHONE SUBSTATION SET

Filed May 13, 1944 3 Sheets-Sheet 3

FIG. 7



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UNITED STATES PATENT OFFICE

2,439,218

TELEPHONE SUBSTATION SET

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Application May 13, 1944, Serial No. 535,403

9 Claims. (Cl. 179—100)

1

This invention relates in general to telephone sub-station sets and in particular to telephone sets for use on board ship.

The telephone set of this invention was designed especially for use on ships, or in like places, where it is subjected to inclement weather, severe shock, or concussions. This telephone set was also designed to withstand a 2,000 foot pound shock and still be in working order.

The principal object of the invention is to provide a locked mounting device which prevents the handset from being removed from its mountings, by shock or otherwise, prior to manual release of the lock.

Another object of this invention is to provide a telephone set capable of withstanding a severe shock without rendering the set inoperative. Another object of the invention is to provide a mounting means, for the handset of the telephone so that the handset will not be dislodged or removed from its mounting in response to shock or concussions to thereby cause false operation of the switchhook contacts, while at the same time the user may easily remove said handset from its mountings in the normal use thereof.

Another feature of the invention relates to means for mounting the face or apparatus plate onto the metal base of the telephone handset. This consists of four members held together by three pins or rods forming a hinge like bracket, one end of which is permanently attached to the metal base of the telephone set and the other end is permanently fastened to the face or apparatus plate.

Another feature relates to the means for mounting the remaining apparatus of the telephone set so as to withstand severe shocks and to make the same splash proof.

The above features and others not specifically mentioned are illustrated in the accompanying drawings comprising Figs. 1 through 7.

Fig. 1 illustrates the front of the telephone set with the handset removed.

Fig. 2 illustrates the rear of the front or apparatus plate 3 and a portion of the metal case 1 showing the hinge like bracket connecting the base 1 to the apparatus plate 3.

Fig. 3 is a sectional view taken along the line FF of Fig. 2 showing the hinge like bracket, and the method of attaching it to the face or apparatus plate 3 and metal base.

Fig. 4 is a sectional view taken along the line BB in Fig. 1 with a portion of the handset added showing the position of the locking plate and

2

the transmitter end of the handset when the latter is in its normal position.

Fig. 5 is a sectional view taken along the line CC in Fig. 1 with a portion of the handset added showing the position of the receiver end of the handset when it is in its normal position.

Fig. 6 is a perspective view of the locking assembly.

Fig. 7 is a sectional view of the apparatus plate taken along the line AA of Fig. 1 with the addition of the handset in its mountings, in order to show the normal position of the switchhook assembly and spring contacts, the locking plate, the lock latch and lock pin with the switchhook springs and the operating member shown in full. The dotted lines indicate one of the positions of the handset and switchhook assembly during removal or replacement of the handset.

Referring to the drawings, the casing 1 comprises a metal base to which is welded a T-shaped member having the metal arms 2 projecting from the sides and bottom for mounting the telephone set on the wall. At the bottom of the casing 1 are provided screw plugs 28, which, upon removal, provide openings for connecting with conduit or cable containing telephone line wires. On the inside of the casing 1 is provided a terminal block (not shown) upon which the telephone wires terminate for interconnecting with the telephone apparatus. Inside of the top of the casing 1 is mounted the ringer movement (not shown). On the outside of the casing 1 on the top are mounted the ringer gong 23. An angle iron 30, partly shown in Fig. 3, is welded to the inside of the casing 1 to form a shelf for mounting the apparatus plate 3. A rubber gasket 35, Figs. 2 and 3, is cemented to the angle iron 30 to form a water tight enclosure when the face plate 3 is fastened by means of screws 18 into the tapped holes in the angle iron 30 of casing 1.

The face plate 3 comprises a flat metal plate which has its center portion depressed inwardly at 4 and 5, Fig. 2, to form a depression or recess, extending into the base 1. This depression extends longitudinally almost the entire length of the face plate and has a deeper depression point, or recess, at 9 than at 19, as may be readily seen in Fig. 7. The depression is longer than the handset and of substantially the same width as the handset except where it has been enlarged to provide space for mounting the calling device 7 in the opening 29 provided in the recess shown in Figs. 2 and 7.

A pair of retaining members 31 and 37 are fastened to the top of the face plate 3 by means of

screws 25 and 26 extending through holes in the flanges of 31 and 37 of the retaining members and screwed into the tapped holes in the face plate 3 and re-enforcing metal straps Fig. 2. These retaining members 31 and 37 are in general cup shaped and have an inner contour conforming fairly closely to the outer contour of the receiver and transmitter housings of the handset. The retaining members are positioned near the ends and above the recesses 9 and 19 in the face plate and extend outwardly therefrom, thereby forming a partial enclosure having an opening between the two retaining members 31 and 37 which is less than the overall length of handset 41, Fig. 7.

The retaining member 31 has re-enforcing ribs 32 and the retaining member 37 has re-enforcing ribs 36, at the points where the receiver housing 42 and the transmitter housing 43 of the handset 41 normally engage their respective retaining members. This is fully shown in Figs. 4 and 5 where it will be seen that the inner contour of the retaining members at lines 33 and 34 conform to the outside contour of the handset housing. These re-enforcing ribs have been placed at this location to prevent bending or breaking of the retaining means at a time when the telephone set is subjected to heavy shock or concussion.

The recesses 9 and 19 extend inwardly from the face plate 3 and the cup shaped retaining members 31 and 37 provide a partial enclosure which is large enough to easily accommodate the handset and permit both longitudinal and radial movements of the handset into the deeper recess 9 even though the restricted opening between the retaining members is less than the overall length of the handset. The recess 9 is deeper than the recess 19 to permit both longitudinal and radial movement of the handset within the enclosure and to provide space for the switchhook plate 66 which controls the operation of the switchhook spring contact assembly, depending upon whether the handset is in its mounting enclosure or removed therefrom.

A stop member comprising the rod 24 extends transversely across the recess 9 to guide the handset and to prevent the inward movement of the receiver housing 42 of the handset until the same has been longitudinally moved into the recess 9 far enough to allow the receiver housing 42 to clear the stop member 24. The stop member 24 is secured to the side wall 4 by means of screws 17, Fig. 5.

A switchhook assembly shown in Figs. 2 and 7 is mounted on a shaft 8 extending transversely through the recess 9.

One end of the shaft 8 extends through a bushing 27 in the side wall 4 and is rotatably mounted therein by means of washer 11 and screw 10, Figs. 2 and 5, screwed into the shaft 8. The center portion of the shaft 8, located within the recess 9, has been notched to permit the switchhook plate 66 to be secured thereto by means of screws 82, Fig. 1. The plate 66 is curved slightly at its outer edges as shown in Fig. 5. An extension 52 on plate 66 is provided to limit the movement of plate 66 by spring 64 when the handset is removed from its mounting as shown in Fig. 7 where it is seen that this limiting extension 52 may engage the curved portion 6 to limit further counterclockwise rotation of the shaft 8 and incidentally further operation of the switchhook switching contacts. The outer end of the shaft 8 extends through a bushing 27' in the side wall 4, Fig. 5, into the hollow space in base 1. This end of the shaft 8 is flattened and to this flattened surface the angular member 54 is secured by means of screws 67. A hole 55 is provided in one arm of member 54 for anchoring one end of spring 64. An insulating bushing 56 is provided on the other arm of member 54 for contacting and operating the switchhook spring contacts.

A switchhook spring contact assembly comprises the usual stationary springs 59 and the actuating spring contacts 57. A heavy spring 58 is also provided in the spring assembly to normally maintain one stationary spring 57 engaged with one of the spring contacts 59, when the contact springs are in normal position as shown in Fig. 7. This heavy spring 58 also prevents vibration of springs 57 when subjected to extreme shocks or concussion. Contact spring assembly also comprises the usual metal plate 61, insulators 60 separating the adjacent springs, the metal block 62 and screws 63, shown in Fig. 7. An angle iron 65 is welded to the wall 4 for anchoring the other end of spring 64, Figs. 2 and 7. The spring 64 is tensioned to rotate shaft 8 counterclockwise and thereby operate the switchhook contacts when the handset, as seen in Fig. 7, is removed from its mounting. Two condensers 70 and 74, Fig. 2, are held in place by metal bands 75 and 72, respectively, and attached to face plate 3 by means of screws 20 and 21, respectively.

The induction coil 80 is enclosed by two side plates 81 and two end plates 79 and is secured to the face plate 3 by means of screws 22 extending through the face plate 3. The two side plates 81 are shaped to fit over the Bakelite ends of the induction coil 80 and firmly hold the induction coil, while the end members 79 fit over cut away portion of the Bakelite ends of the induction coil as shown in Fig. 2.

An insulated terminal block 77 having terminals 78 for the connections between face plate 3 and base 1, is secured to the underneath side of depression 5 as shown in Fig. 2. This terminal block is also used to fasten one end of the handset cord (not shown).

When the handset 41 is in its mounting the spring actuated plate 66 presses against the receiver end and holds the upper end of the handset against the retaining member 31 as shown in Figs. 5 and 7, and also holds the lower end of the handset against the retaining member 37.

In the recess 19 there is a lock plate 50, Figs. 4 and 7, together with its lock latch 51, rotatably mounted on a lock plate shaft 53. In the recess 19 there is also mounted a lock plate spring 40 which tends to move plate 50 to the dotted position of Fig. 7, and a lock guide 47 which controls the direction of the movement of the lock pin 48. The lock plate shaft 53 and lock pin 48 are mounted transversely across the recess 19. The lock pin 48 moves to the left, Fig. 6, and its left end passes back of the lock latch 51 under control of the trip lever spring 49, when the transmitter end of the handset is pressed down against the projecting portion 68, of the lock plate 50, which is perpendicular to the top face of lock plate 50. The spring 49 has one end secured to trip lever 45 and the other end to the wall of depression 5. The end of the lock pin 48 moves out from behind the lock latch 51 when the lock pin 48 moves to the right under control of the lock lever 44, Fig. 6. The lock lever 44 shown in Figs. 1 and 6 may be moved to the left manually,

the movement to the right being controlled by the trip lever spring 49.

The face plate 3 is normally held in place on the metal base by sixteen screws, such as 18, there being a rubber gasket between face plate 3 and the base 1.

When the screws are removed the weight of the face plate, together with the equipment mounted thereon, is borne by a hinged bracket. After the screws have been removed the face plate can be drawn forward slightly and then rotated to the right and finally come to rest on the right of the metal base as shown in Figs. 2 and 3. Thus the apparatus on the underneath side of the face plate, as well as the apparatus within the base, is exposed for inspection. The hinge like bracket shown in Figs. 2 and 3 comprises four members 12, 13, 14 and 15 and three pins 16. Member 12 is fastened to the face plate 3 by two screws 69. Member 15 is fastened to the base plate 1 by two screws 71. The guide bracket 73 prevents the face plate from swinging into any position which could cause damage to any equipment or wiring.

When the handest is in its mounting the transmitter end of the handset is prevented from being moved away from the inside surface of the retaining member 37 by the lock plate 50, through the combination of the lock plate, lock latch, lock guide and lock pin. Due to the retaining members 31 and 37, the lock plate 50 and lock pin 48, the handset is retained within the enclosure formed by the retaining members and recesses 9 and 10, when the telephone is subjected to severe shocks or concussions, such as exploding bombs or the firing of large guns.

In order to remove the handset from its enclosure it is first necessary to move the top of the lock lever 44 to the left in the direction of the arrow D (Fig. 6). This withdraws, in the direction of the arrow E, the lock pin 48 from its normal position back of lock latch 51, as seen in dotted lines in Fig. 1. This operation moves the lock pin 48 to the right in the direction of the arrow E, as seen in Figure 6, and as the lock pin guide block 47 is fixed, the left end of lock pin 48, as seen in Figure 6, will disappear within the lock pin guide block 47. It will be noted, in Figure 4, that the end of the lock pin 48 which is at the left in Figure 6, is shown at the right in Figure 4 and therefore when the lock lever 44 is moved to the left as described above, the lock pin 48 moves to the left as seen in Figure 4 and its end (that is the right end as seen in Figure 4) moves to the left from its normal position below the lock latch 51 to a second position, that is the unlocked position. The two positions of the lock latch 51 can be seen in Figure 7, wherein the normal or locked position is shown in full lines and the second or unlocked position is shown in dotted lines. The second position of lock latch 51 is accomplished by pressure from spring 40 after the end of lock pin 48 disappears within the lock pin guide block 47, as described above, and the handset has been removed from the mounting. After the above described operations, the handset is moved longitudinally upwards. The longitudinal movement is accompanied by pressure on the receiver end of the handset to force the receiver housing further back into recess 9. This movement is continued until the transmitter end of the handset is free from the retaining member 37 and can be drawn forward, followed by a longitudinal movement downward until the receiver end of the handset is completely withdrawn from the retaining member 31. The handset is now ready for use.

The locking device is shown in Figs. 6 and 7 and is composed of the lock plate 50, the lock latch 51 attached to the rear of the lock plate, a lock guide 47, a lock pin 48 with a spacer 76, a trip lever 45 with a trip lever spring 49 and trip lever spring hook bracket (not shown) secured to the wall of depression 5, a lock lever shaft 46 and a lock lever 44. When the handset is not in use the lock lever 44 on the outside of the face plate 3, is in the normal position as shown in Fig. 1 and can be rotated to the left approximately 15 degrees, such movement is communicated through the trip lever 45, underneath the front plate, to the lock pin 48 moving the lock pin to the right (in the direction of the arrow E, Fig. 6) far enough to release the lock latch 51 on the back of the lock plate (shown in dotted lines, Fig. 1). The lock plate 50 will be pressed backward under tension of the lock plate spring 40 when the handset is moved longitudinally upwards and the handset which previously had been located within the retaining members 31 and 37 can now be removed. The pressure on the lock lever 44 can be maintained by one finger or the thumb of the hand which grasps the handset to initiate longitudinal movement, thereby the entire operation described above can be made with one hand.

In order to replace the handset in its mounting the reverse order of movements, with the exception of the manipulation of the lock lever, as above set forth, are required due to the opening formed by the retaining members 31 and 37 being less in length than the handset. The receiver end of the handset is first pushed at an angle into the upper portion of the enclosure, formed by the retaining member 31 and recess 9, and the handset is in a position shown in dotted lines Fig. 7. The transmitter end of the handset will now pass over the top of the retaining member 37 when the transmitter end of the handset is moved forward into recess 10. During this forward movement the transmitter housing meets the locking plate. At the end of this forward movement the handset is finally moved longitudinally downwards causing the transmitter housing to press against the upturned end 63 of the lock plate 50, causing it to rotate on its axis 53. This movement causes the lock plate with its lock latch 51 to be lifted forward far enough for the lock pin 48 under pressure of the trip spring 49 to move to the left as seen in Fig. 6 until the end of the lock pin passes back of the lock latch 51 to the position shown in Fig. 4, thus securely locking the handset within the retaining members. Hand pressure should be maintained on the handset until the final downward movement is completed, which will be indicated by a movement of the lock lever 44 from its vertical position, to a position about 15 degrees to the right to its normal position.

From the foregoing description it will be seen that the locking arrangement must be tripped, and certain prescribed movements of the handset are necessary before the same can be removed from the restricted opening in its mounting and therefore a telephone has been provided with a shock proof mounting and locking device to maintain the handset in its mounting and to prevent false operation of the switchhook spring contacts due to shocks or concussions.

What is claimed is:

1. In a telephone set, mounting means includ-

ing a recess and two retaining members requiring upward longitudinal movement of the handset into the recess in order to remove the transmitter end of the handset from one of the retaining members and then outward movement and downward longitudinal movement of the handset from said recess and the other retaining member in removing the handset from its mounting, a lock lever, a lock pin, a lock latch attached to a lock plate normally preventing any movement of said handset, a set of switching contacts actuated when said lock lever is moved to cause said lock pin to release said latch and lock plate allowing said handset to be moved in said upward longitudinal, then outward and downward longitudinal movements.

2. A locking mounting for a telephone handset including a face plate having recessed portions extending inwardly for receiving the transmitter and receiver portions of said telephone handset, two retaining members secured to said face plate for forming a partial enclosure of said recessed portions, said retaining members extending outwardly from said face plate and having inner contours conforming substantially to the rear outer contours of the handset portions housing the receiver and transmitter of the handset, a spring actuated member within the receiver portion of said recess, a plate within said transmitter portion of said recessed portion, and means for locking said plate against movement for holding said handset in engagment with said retaining members.

3. A locking mounting for a telephone handset including a base, recessed portions extending within said base for receiving the receiver and transmitter portions of the handset, a lock plate pivotally mounted in one of said recessed portions of said base, a lock latch associated with said plate, a lock member located partly within said one recessed portion, a spring for actuating said member, a lock lever, means including said member under tension of said spring necessitating movement of said lock lever before said handset can be removed from said portions.

4. A locking mounting for a telephone handset including a base, a recessed portion extending within said base for both the receiver and transmitter portions of the handset, a shaft pivoted in said recessed portion of said base, a lock plate attached to said shaft and having an upturned end, a manually operated lock lever controlling said plate, a lock plate spring with one end attached to the recessed portion of the face plate and the other end tensioned against the upturned end of the lock plate for retaining the lock plate in position to receive the transmitter end of the handset without manual movement of the lock lever.

5. A locking mounting for a telephone handset including a base, a recessed portion extending within said base for receiving both the receiver and transmitter portions of the handset, a shaft pivoted in said recessed portion of said base, a lock plate attached to said shaft, a lock plate spring with one end attached to the recessed portion and the other end tensioned against the lock plate for retaining the lock plate in position to receive the transmitter end of the handset, and a lock latch associated with the said lock plate for holding the lock plate in another position when the handset is in its mounting.

6. A locking mounting for a telephone handset including a base, a recessed portion extending within said base for receiving both the receiver

and transmitter portions of the handset, a shaft pivoted in said recessed portion of said base, a lock plate attached to said shaft and having an upturned end, a manually operated lock lever, a lock plate spring with one end attached to the recessed portion of the face plate, and the other end tensioned against the upturned end of said lock plate, a lock latch associated with the said lock plate, a lock pin within said recessed portion, a trip lever spring for causing said pin to maintain the lock plate and the lock latch in a position to prevent the handset from being removed from its mounting without manual movement of the lock lever, causing movement of said pin against the tension of said spring to permit movement of said lock plate.

7. A locking mounting for a telephone handset including a base, a recessed portion extending within said base for receiving the receiver and transmitter portions of the handset, a shaft pivoted in said recessed portion of said base, a lock plate attached to said shaft and engaged by one portion of the handset when placed in its mounting, a lock plate spring with one end attached to the depressed portion of the face plate and the other end tensioned against the lock plate, a lock latch associated with said lock plate, a lock pin partially within said recessed portion, a manually operated lock lever, a trip lever member and a spring attached at one end to the trip member and at the other end to the face plate to maintain the lock pin in position, thereby necessitating a manual movement of the lock lever before the handset can be removed from its mounting.

8. In a locking mounting for a telephone handset, a shock proof mounting means including a recess and a locking retaining plate in said recess for preventing dislodgement or removal of said handset from its mounting in said recess in response to shock or concussion, a lock lever, a lock pin, a lock latch attached to said retaining plate, movement of said lock lever moving said lock pin from engagement with said lock latch to cause retaining plate to release said handset and then permit longitudinal movement of said handset receiver into said recess and then outward movement of said handset before said handset can be removed from said locking mounting.

9. In a telephone set, a mounting and locking means for a handset including a recess, a set of switching contacts, a lock plate in said recess, a lock lever, a lock pin, a lock latch attached to said lock plate, retaining means for said handset, means operated when said lock lever is moved to cause said lock pin to release said lock plate to permit removal of said handset and actuation of said switching contacts.

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Executrix of the Estate of Herbert F. Obergfell, deceased.

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