

Dec. 25, 1951

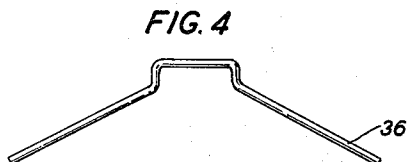
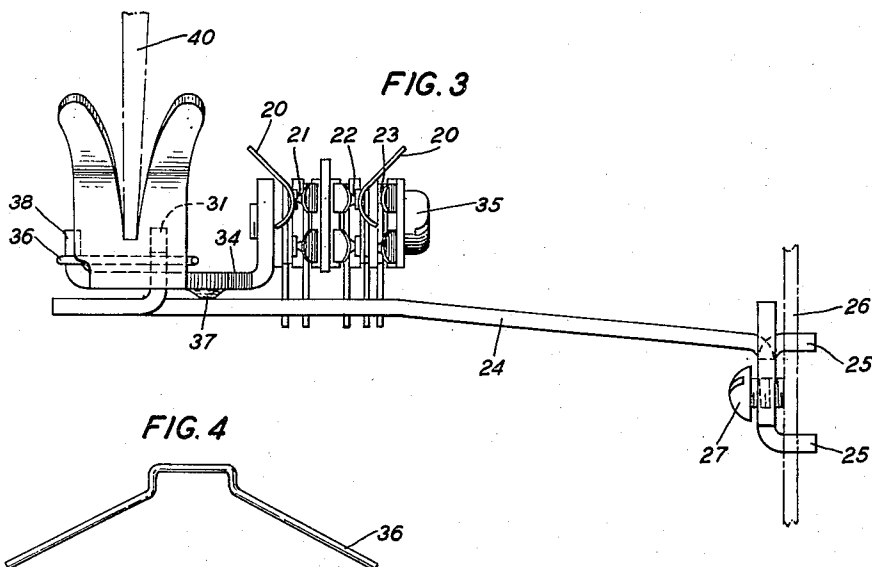
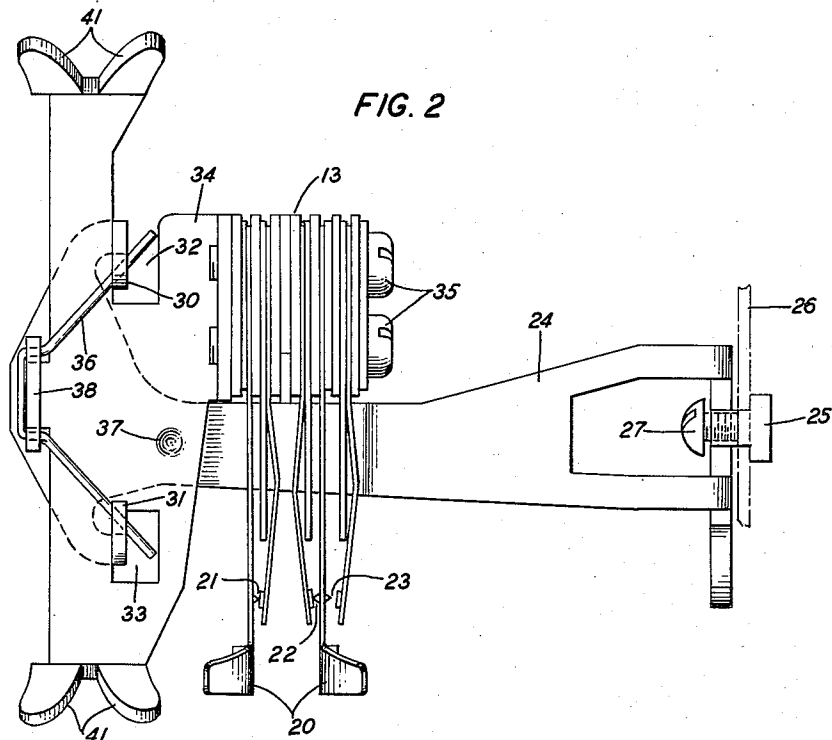
C. L. KRUMREICH

2,580,105

TELEPHONE SWITCH AND MOUNTING

Filed Nov. 24, 1950

2 SHEETS—SHEET 2



INVENTOR
C. L. KRUMREICH
BY *M. C. Kenney*
ATTORNEY

UNITED STATES PATENT OFFICE

2,580,105

TELEPHONE SWITCH AND MOUNTING

Charles L. Krumreich, Whippany, N. J., assignor
to Bell Telephone Laboratories, Incorporated,
New York, N. Y., a corporation of New York

Application November 24, 1950, Serial No. 197,452

4 Claims. (Cl. 179—159)

1

This invention relates in general to substation telephone sets and more particularly to improved means for mounting plunger operated switch assemblies employed in so-called exclusion or secrecy type subsets.

The principal object of this invention is to provide means for mounting the plunger operated switch assembly which is simple in construction, economical to manufacture, easily accessible for repair and maintenance and at the same time retains the desired features found in sets now in use.

In recent years effort has been made to design telephone sets wherein all of the components and wiring are mounted on the base plate of said set, thereby forming a unit type chassis assembly. Since such construction enables the housing to function only as a cover for the base assembly, it should be apparent that this arrangement is desirable both as to economy of manufacture and accessibility for repair in that the essential operating components are exposed in a single unit when the housing is removed. The particular type of telephone set to which this invention relates is the so-called exclusion or secrecy subset, the operation of which has been described in the following patents: A. Tradup Patent No. 2,212,216, issued August 20, 1940 and D. H. King Patent No. 2,273,530, issued February 17, 1942. A subset of this type contains a switch assembly which serves to perform such operation as the opening of contacts to an extension telephone, thereby securing privacy on the particular line in use. The switch is operated by a special plunger, inserted through the cradle of the desk stand, which may be lifted manually to disengage certain electrical contacts after the handset has been removed from said cradle.

In order to retain the above-mentioned design feature of the set, it is necessary that the plunger operated switch be mounted on the base plate of the desk stand. This presents an alignment problem considering that the switch and operating plunger must be located fairly accurately relative to one another for proper operation. It has been found that if both the plunger and switch are rigidly positioned with respect to the housing and base respectively, manufacturing variations will accumulate to such an order of magnitude that satisfactory alignment will rarely be realized. In order to overcome this difficulty, the present invention incorporates a floating feature in the switch mounting assembly. Such an arrangement allows the switch to move a slight amount in any direction relative to the base plate of the desk stand, thereby maintaining a correct

2

position relative to the housing and the plunger positioned therein. In order to realize this floating feature a cantilever spring type bracket is employed to support said switch assembly above the base plate, the switch being flexibly secured to said bracket in such a manner as to be free to move slightly relative thereto.

Other objects and features not specifically pointed out will be apparent hereinafter in the description which, together with the accompanying drawings, illustrates a preferred embodiment of the invention in which:

Fig. 1 shows a plan view of the desk stand, a portion of the housing having been cut away to illustrate the plunger, switch and mounting for said switch in relation to other components of the telephone set;

Fig. 2 shows a top view of the switch assembly and mounting;

Fig. 3 represents a side view of said switch assembly and mounting;

Fig. 4 is a wire spring for attaching the switch plate to the mounting bracket; and

Fig. 5 shows in detail the method of attaching the mounting bracket to the base of the desk stand.

Referring now to Fig. 1, base 18 of the desk stand is enclosed by housing 10 which is provided with four upwardly extending prongs 11, a pair of which are shown in cross-section. These prongs form a cradle for supporting the handset, not shown, when the telephone is not in use. Between each pair of said prongs there is an aperture in housing 10 through which the operating plungers are inserted. These comprise plunger 12 which is employed to control the contacts of secrecy switch 13, and a second plunger, not shown, inserted in the second aperture in housing 10 to operate the usual line contacts to connect the telephone with the line when the handset is removed from the cradle. Prior to removal of the handset from the desk stand the top of plunger 12 is held flush with the bottom of the cradle formed in housing 10; the weight of said handset so holds the plunger in this position. Upon removal of the handset, a lever, the edge of which is designated 14 (the remainder having been cut away in Fig. 1 for the purpose of simplicity) exerts an upward force on shoulder 16 of plunger 12 so as to lift said plunger to the position shown. This force is supplied by coiled spring 15. In order to operate the contacts of secrecy switch 13, plunger 12 must then be gripped by knob 19 and manually lifted to the position indicated by the broken lines. This in turn will force wedge-shaped portion 17 of said

3

plunger between the ear-shaped extensions 20 of switch 13 so as to open contacts 21 and 22 and close contact 23, said contacts being shown in Fig. 2. It is through these contacts that the exclusion switching operation is performed. The replacing of the handset serves to depress both of said plungers to their normal non-use positions.

Since the position of plunger 12 is rigidly fixed by the aperture in housing 10 through which said plunger slides, it is essential for operation of switch 13 that wedge 17 be properly positioned so as to engage ears 20 of said switch. Also, since the switch assembly is to be mounted on base 18 rather than on housing 10 it is important that switch 13 have some latitude of movement so that it can assume the correct position relative to said plunger. Mounting means comprising bracket 24, switch plate 34 and wire spring 35 have been utilized in this invention to support switch 13 in the required manner herein set forth.

Figs. 2, 3, 4 and 5 illustrate in detail the means used to support the plunger operated switch. Bracket 24 is essentially a cantilever spring which serves to nullify all height variations between the base and housing assemblies. This is accomplished by so placing the bracket, the right end of which is secured to line switch bracket 25, attached to base plate 18, that the free left end will be deflected downward by rib 40 of housing 10 thereby holding the switch in place relative to said housing. As shown in Fig. 5 the fixed end of bracket 24 is provided with two T-shaped extensions 23 which are inserted in two corresponding T-shaped slots 28 in bracket 25. Bracket 24 is then raised slightly and clamped in position by set screw 27. The free end of bracket 24 is provided with two inward facing hook-shaped ears 30 and 31 (Fig. 2) which engage rectangular openings 32 and 33 respectively of switch plate 34. Switch 13 is attached to plate 34 by means of screws 35. Spring 36, preferably constructed of music wire, is placed around upward projecting T-shaped extension 38 of plate 34 and extends outward therefrom exerting pressure on ears 30 and 31. Plate 34 thus rests on bracket 24 at the embossed point of contact 37 and is held in place by means of said spring. Embossment 37 limits surface contact between the two elements thereby reducing friction, which in turn enables the switch assembly to be easily moved so as to assume its proper position relative to said plunger, openings 32 and 33 being of sufficient size that ears 30 and 31 can move slightly therein.

The large vertical rib 40, a projection of housing 10, serves dual functions: namely, nullifying height variations between base and housing, as previously described, and locating switch plate 34 in the proper front-to-back position with respect to plunger 12. Ears 41 of plate 34 form V-shaped slots which engage rib 40, and are flared to permit easy entry of the housing at the base of the rear prong, locating the switch laterally.

It is to be understood that the particular form of this invention herein shown and described is

4

to be taken as a preferred example of the same and that certain modifications of shape, size and assembly of parts may be resorted to without departing from the scope of said invention.

What is claimed is:

1. In a telephone desk set including a base plate, a plunger-operated switch assembly, a plunger and a housing for said set, means for mounting said switch assembly comprising a cantilever spring-type mounting bracket fixed at one end to said base plate, and means for flexibly attaching said switch assembly to the free end of said mounting bracket.

2. In a telephone desk set including a base plate, a plunger-operated switch assembly, a plunger and a housing for said set, means for mounting said switch assembly comprising a cantilever spring-type mounting bracket fixed at one end to said base plate, means for flexibly attaching said switch assembly to the free end of said mounting bracket, and means for positioning said switch assembly relative to said plunger.

3. In a telephone desk set including a base plate, a plunger-operated switch assembly, a plunger and a housing for said set provided with a rib portion thereof and an aperture therein through which said plunger operates, means for mounting said switch assembly comprising a switch plate attached to said switch assembly and provided with a plurality of upturned extensions, two of which engage the rib of said housing thereby positioning the switch assembly relative to said plunger, a cantilever spring-type mounting bracket fixed at one end to said base plate and having a plurality of upturned extensions which engage suitable slots in said switch plate, and a wire spring which presses against the extensions of the mounting bracket and switch plate thereby holding said elements together.

4. In a telephone desk set including a base plate, a plunger-operated switch assembly, a plunger and a housing for said set provided with a rib portion thereof and an aperture therein through which said plunger operates, means for mounting said switch assembly comprising a switch plate attached to said switch assembly and provided with three upturned extensions, two of which are V-shaped to permit entry of the rib of said housing thereby positioning said switch assembly relative to said plunger, a cantilever spring-type mounting bracket provided at one end with two upturned extensions which engage suitable slots in said switch plate, the other end of said bracket having extensions which engage corresponding slots in said base plate thereby attaching said bracket to said base plate, and a wire spring removably fixed on the third extension of said switch plate and pressing against the upturned extensions of said mounting bracket thereby holding said elements together.

CHARLES L. KRUMREICH.

No references cited.