Aug. 27, 1946. S. M. KENERSON 2,406,545

ELECTRIC SIGNAL DEVICE

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Fig. 1.

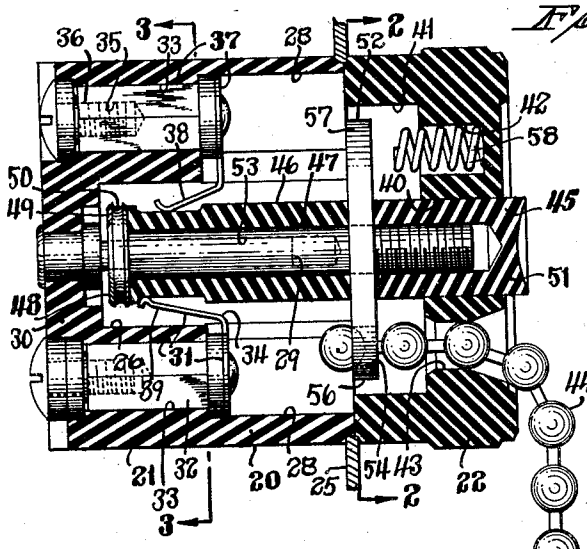


Fig. 2.

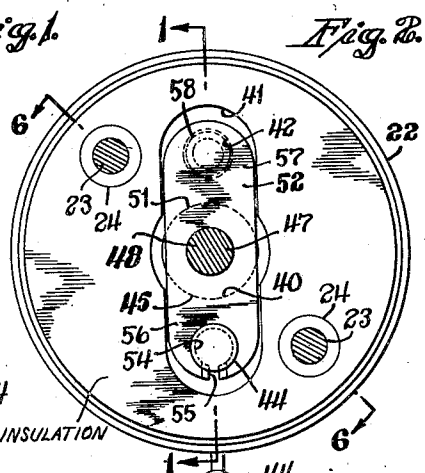


Fig. 3.

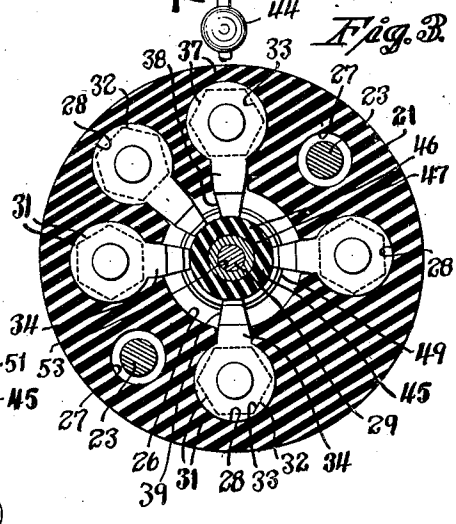


Fig. 4.

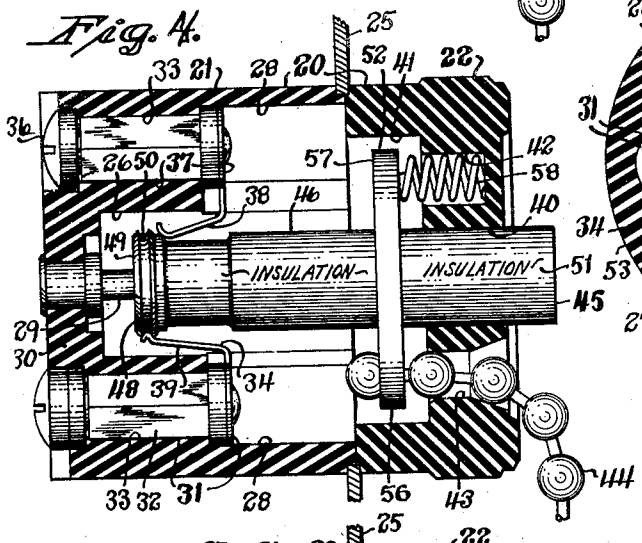
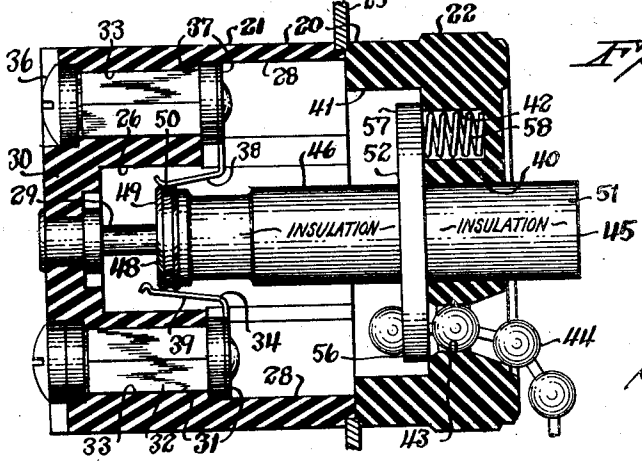


Fig. 5.



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Fig. 6.

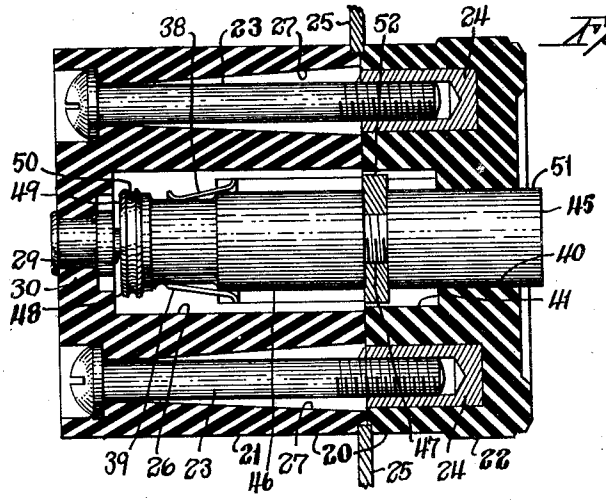


Fig. 9.

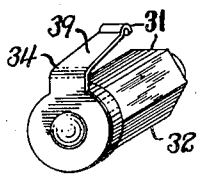


Fig. 7.

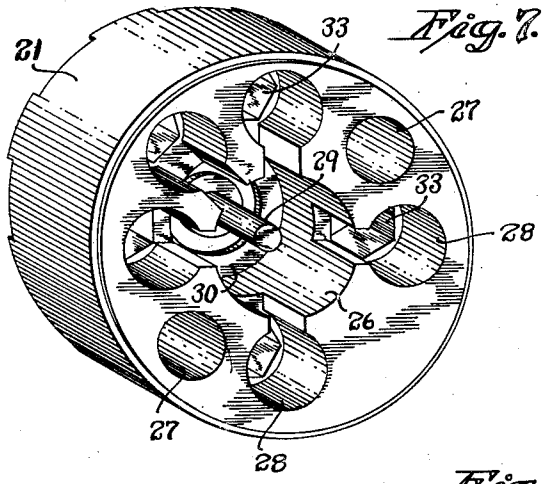


Fig. 10.

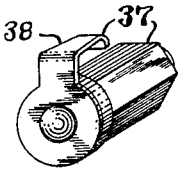


Fig. 8.

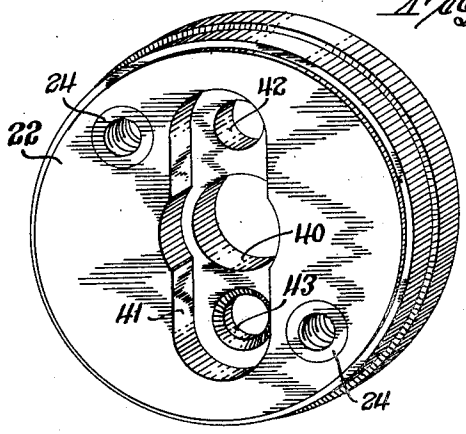
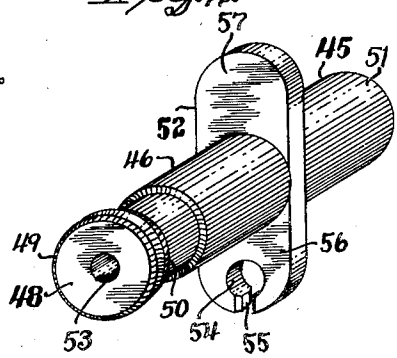


Fig. 11.



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UNITED STATES PATENT OFFICE

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ELECTRIC SIGNAL DEVICE

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Application October 15, 1943, Serial No. 506,315

3 Claims. (Cl. 200—16)

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This invention relates to improvements in electric signal devices of the type used in hospital nurse-calling systems.

One object of this invention is to provide an improved electric signal device of the type referred to, which requires a minimum of force to be applied to operate it.

Another object of this invention is to produce an improved electric signal device of the type referred to, formed of simple elements with a minimum number of movable parts, readily manufactured and readily assembled to produce a simple, efficient and durable construction at low cost.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention may be understood by reference to.

The accompanying drawings forming part of the present disclosure, in which one way of carrying out the invention is shown for illustrative purposes:

Fig. 1 is a central-longitudinal sectional view on line 1—1 of Fig. 2 illustrating one embodiment made in accordance with the present invention;

Fig. 2 is a transverse sectional view on line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view on line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 1 but with the parts in a different position of operation;

Fig. 5 is a view similar to Fig. 4 but with the parts in still another position of operation;

Fig. 6 is a sectional view on line 6—6 of Fig. 2;

Fig. 7 is a perspective view of the base-receptacle member;

Fig. 8 is a perspective view of the cover-receptacle member;

Fig. 9 is a perspective view of one of the light-circuit contacts;

Fig. 10 is a perspective view of the buzzer-circuit contact; and

Fig. 11 is a perspective view of the main portion of the slidable-switch contact-member.

Referring to the drawings showing the particular form of the invention chosen for illustration, the electric signal device primarily consists of a receptacle 20 which includes a base or body-portion 21 and a front cap 22 connected together by bolts 23 and nuts 24, with a carrier-plate 25 clamped between the parts 21 and 22.

The base 21 is made of suitable insulation material, preferably of any of the usual molded plastic materials, and is provided with a central hole 26, two bolt-receiving holes 27 for receiving

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the bolts 23, and five contact-member receiving holes 28. A stud or pin 29 is firmly secured to the rear wall 30 of the base 21 and extends forward axially of the opening or hole 26. Four light-circuit switch-contact members 31 are secured in four of the holes 28. Each switch-contact member 31 includes a hexagonal body-member or portion 32 adapted to slidably fit in a corresponding hexagonal rear portion 33 of one of the holes 28, and has a spring-contact member 34 riveted or otherwise secured to one end of the body-portion 32, the other end of the body-portion 32 having a screw-threaded hole 35 to threadedly receive a screw 36, which screw 36 serves both to clamp the switch-contact member 31 firmly in place and also to provide for attaching an electrical wire (not shown) under the head of the screw 36. A buzzer-circuit switch-contact member 37 which is substantially identical with each of the four light-circuit switch-contact members 31 except that its spring-contact arm 38 is of shorter length than the spring-contact arm 39 of each of the contact-members 31, is similarly secured in one of the holes or openings 28.

The cap-member 22 is also made of insulation material, preferably of molded plastic material, and is provided with an axial hole 40 therethrough, a slot 41, a spring-receiving recess 42, a hole 43 for the passage therethrough of a flexible chain-pull 44. The two nut-members 24 previously referred to, can be secured in the cap 22 by being placed therein as inserts when the cap 22 is molded.

A plunger or electric-switch contact-means 45 includes a tubular plastic insulation member 46 through which extends the threaded shank 47 of a switch-contact member 48 having a head 49 having an annular-channeled switch-contact 50. A pushbutton-portion 51 of vulcanized fiber or other suitable material, has screw-threaded engagement upon the screw-threaded shank 47 and clamps a bar 52 between the parts 46 and 51. The pushbutton 51 is longitudinally slidably mounted in the hole 40, and the switch-contact 48 has a central axial bore or hole 53 slidable on the stud or pin 29. The flexible chain-pull 44 is connected by means of the hole 54 and slot 55, to one arm 56 of the bar 52, and the other arm 57 of the bar 52 is in position to engage against a coil spring 58 seated in the recess 42.

The spring-contact arms 39 being all of the same length, close the circuits through these four contact-members when the chain-pull 44 is pulled sufficiently to slide the plunger 45 from the posi-

tion shown in Fig. 1 to the position shown in Fig. 4 so that current entering from one of the spring-contact arms 39 will pass out through the other three spring-contact arms 39 to activate any circuits desirable such, for example, as to light electric lights, as is usual and well known. It will be observed that in this first stage of movement, the spring 58 has not at all resisted movement of the plunger 45, since it is spaced a substantial distance away from the arm 57, as is clearly seen from Fig. 1, and therefore this first stage of movement which lights the signal lights, only requires a minimum of force by the operator. Now that the spring-contact arms 39 are all seated in the annular channel 50 as shown in Fig. 4, it will be seen that the arm 57 has come into position to just be in engagement with the spring 58. If now the chain-pull 44 is pulled against the action of the spring 58 until the spring is compressed to the position shown in Fig. 5, the spring-contact arms 39 will all remain in contact with the annular head 49 of the switch-contact 48 and the shorter spring-contact member 38 now also comes in contact with the head 49 so that the circuit through the contact 38 is activated for any desired purpose, as, for example, ringing a bell or buzzer.

Immediately upon release of the flexible chain-pull 44, the spring 58 pushes against the arm 57 to push the plunger 45 from its position shown in Fig. 5 back to its position shown in Fig. 4, to thus leave the spring-contacts 39 all energized, but to break the circuit to the contact 38, thus placing the latter again in open circuit condition. Thus, during operation of the chain-pull 44 by a patient, once this has been pulled to its full extent by the patient and released, the various signal lights light, and the bell or buzzer is operated temporarily until the patient releases pull on the chain 44, whereupon only the lights remain on. Thereafter, each time the patient again pulls the chain 44, the bell or buzzer is operated, while at all times the signal lights remain lighted. After the nurse or other attendant has performed such service as makes it desirable to extinguish the signal lights, she pushes inward upon the exposed end of the push-button 51 to push the plunger 45 from its position shown in Fig. 4 to its original position shown in Fig. 1, where it remains until again pulled forward by a patient pulling the pull-chain 44.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

I claim:

1. An electric signal device, including: a receptacle having a plurality of fixed electric switch-contacts; an electric switch-contact means longitudinally slidable in opposite directions to either of two opposite extreme positions or to an intermediate position; said slidable switch-contact means when in one of its said extreme positions being in open-circuit position, and when in said intermediate position closing the circuit through only certain of said fixed contacts, and when in the other extreme position closing the circuit through all of said fixed contacts; spring-means constructed and arranged to not resist the movement of said slidable switch-contact means from said extreme open-circuit position to said intermediate position but to yieldingly resist the movement of said slidable switch-contact means from said intermediate position to said extreme closed-circuit position; and means for sliding said slidable switch-contact means to said extreme open-circuit position.

2. An electric signal device, including: a receptacle having a plurality of fixed electric switch-contacts; an electric switch-contact means longitudinally slidable in opposite directions to either of two opposite extreme positions or to an intermediate position; said slidable switch-contact means when in one of its said extreme positions being in open-circuit position, and when in said intermediate position closing the circuit through only certain of said fixed contacts, and when in the other extreme position closing the circuit through all of said fixed contacts; spring-means constructed and arranged to not resist the movement of said slidable switch-contact means from said extreme open-circuit position to said intermediate position but to yieldingly resist the movement of said slidable switch-contact means from said intermediate position to said extreme closed-circuit position; flexible pull-means for sliding said slidable switch-contact means from said extreme open-circuit position to said intermediate position, and against the action of said spring-means from said intermediate position to said extreme closed-circuit position; and push-means for sliding said slidable switch-contact means to said extreme open-circuit position.

3. An electric signal device, including: a receptacle having a plurality of fixed electric switch-contacts; an electric switch-contact means longitudinally slidable in opposite directions to either of two opposite extreme positions or to an intermediate position; said slidable switch-contact means when in one of its said extreme positions being in open-circuit position, and when in said intermediate position closing the circuit through only certain of said fixed contacts, and when in the other extreme position closing the circuit through all of said fixed contacts; two arms rigid with said slidable switch-contact means; flexible pull-means attached to one of said arms; spring-means constructed and arranged to engage the other of said arms to not resist the movement of said slidable switch-contact means from said extreme open-circuit position to said intermediate position but to yieldingly resist the movement of said slidable switch-contact means from said intermediate position to said extreme closed-circuit position; and one end of said slidable switch-contact means being manually engageable for sliding said slidable switch-contact means to said extreme open-circuit position.

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