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J. H. SMOOT

2,311,883

HORN SYSTEM AND SWITCH

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Fig. 1

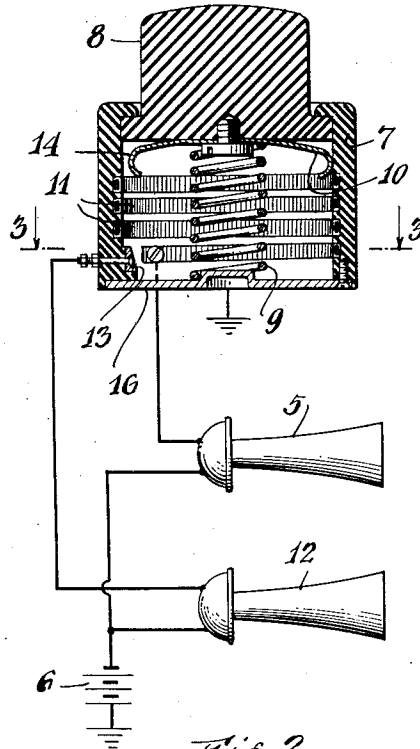


Fig. 2

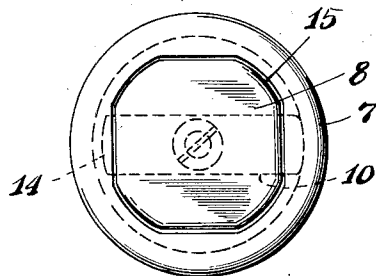
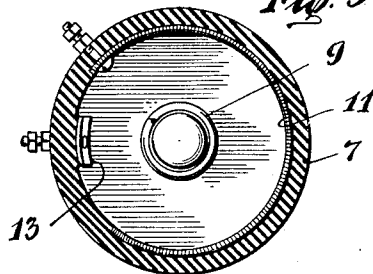


Fig. 3



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HORN SYSTEM AND SWITCH

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2 Claims. (Cl. 201—55)

This invention relates to a control system and a unit for operating the same, such system and unit being primarily intended for use in connection with the operation of acoustical instruments. In its more specific aspects, the present invention aims to provide a switch unit and system within which horns are included and which are of the type commonly associated with motor vehicles.

It is an object of the invention to provide an apparatus of this character and by means of which under casual operation, a satisfactory warning signal results. In other words, an actuation is produced—which, in the case of a motor vehicle—would be eminently proper for city driving conditions.

A further object is that of producing a structure or system, which, when an operator resorts to more than a casual operation, (i. e. a violent, or emphatic actuation) a corresponding signal will be produced. In other words, under emergency or high speed driving conditions, it is natural for a human being to react with more intensity. Thus, by means of the present invention, such reaction will be translated into a warning signal of greater intensity and substantially commensurate with the signal which should be rendered under these circumstances.

A still further object is that of combining the results as set forth in the preceding objects in a unitary form of apparatus and which will require no special relays, complicated wiring, or other expensive arrangement of apparatus. In fact, by means of the present invention, more or less standard and accepted parts may be employed.

Consequently, it is an additional object to furnish a switch and system which may be utilized in a motor vehicle without any substantial increase or expense over systems as heretofore provided, but which, at the same time, will produce the afore stated and desired results.

Still another object is that of furnishing a switch structure (where special structure is necessary) and which will involve relatively few parts, each individually simple and rugged in construction, and operating over long periods of time with freedom from all difficulties.

With these and other objects in mind, reference is had to the attached sheet of drawings, illustrating practical embodiments of the invention and in which;

Fig. 1 is a sectional side view of the switch or control member and showing in association therewith, a pair of warning or horn units;

Fig. 2 is a plan view of the control member as shown in Fig. 1; and

Fig. 3 is a sectional plan view taken along the lines 3—3 and in the direction of the arrows as indicated in Fig. 1.

Referring primarily to Fig. 1, the numeral 5 indicates a horn or electrically operated signal unit of a more or less conventional type, and which will produce a certain definite tone or else—according to the voltage imposed thereon—a tone of increasing frequency, or volume within a definite limited range. This unit is connected to a source of electrical current supply as indicated at 6. At this time it is to be understood that this horn should be constructed in a manner such that it will operate under low voltage, but will also operate, and not be injured, if voltages of substantially higher value are employed.

Thus, if the unit be of the electromagnetic type, it will function, for example, if low voltage current is passed therethrough. If the current is increased gradually, the amplitude of vibration of the diaphragm will correspondingly increase. According to the construction of the horn, this may or may not result in a change in the pitch. In any event, however, a tone of greater intensity and range will result until the full value of the current from source 6 is passing through the horn. In the case of a motor driven horn, the increase in current value will result in the rotor being operated at increasingly higher speeds, which will usually cause an increase in pitch but will also, cause greater amplitude of vibration on the part of the diaphragm and increasing intensity and range of tone.

A horn of this type is ordinarily actuated by a switch member associated, for example, with the steering column of a vehicle. Such a switch member has been somewhat diagrammatically illustrated in Figs. 1 to 3. No attempt has been made to emphasize or show the artistic configurations which might be embodied. Rather, the illustration concentrates on one preferred form of construction whereby the desired results may be achieved. Accordingly, the numeral 7 indicates a housing, which may be formed of dielectric material and from which a button or actuator 8 extends.

This element is normally maintained in projected position by means of a spring 9. A contact arm in, for example, the form of a spring strip 10 is secured to under side of and moves with the button 8. As will be observed, the inner wall of the housing has affixed to it a resistance in the form of a helical spiral winding 11. The

contact spring 10, which is mounted on the under side of button 8, makes wiping contact with the resistance such that a depression of the button 8 causes this contact arm to traverse the windings of the resistance. It is also to be noted that the contact arm may be grounded, through the spring and base of the switch or in any other desired manner and that a lead extends from the end of resistance 11 to the horn 5.

It is apparent if the button or actuator 8 is lightly touched, and/or held in a partially depressed position, that current from the source 6 will flow through the horn 5 and thence through the major portion of the resistance 11. Under these circumstances, only low voltage will be imposed on the horn which will, accordingly, operate as a warning signal suitable for ordinary city use. As button 8 is further depressed, fewer wipings of resistance 11 will remain on the circuit and thus, with the decreased resistance, the intensity or volume of the warning signal will be increased. In fact, as the button is pushed inwardly, the increase in intensity of sound—particularly if it is combined with an increase in pitch—will serve to produce an extremely effective type of warning signal suitable for use in high speed driving. This intensity will, of course, increase until the button 8 is fully depressed, at which time the full voltage from source 6 will pass through and operate the unit 5.

For the sake of avoiding undue illustration, Fig. 1 also includes the thought that within the scope of the present invention, a second horn or unit 12 may be operated by the control. This unit as shown is connected to the source 6 and is also connected to a contact 13 within housing 7. If such a structure is employed, then a second contact arm 14 is utilized. This second contact arm, as secured to the under side of button 8, is shorter than the arm 10 and, accordingly, does not reach the inside wall of the housing 7 and thus does not engage the resistance 11. Arm 14 is, however, of sufficient length so that when the button 8 reaches its most depressed position this arm does make contact with element 13.

In such event, it will be apparent that current will flow through the horn 5 as heretofore described. Additionally, with the contacts closed, current will flow with maximum intensity through horn 12 and the lead of the same, which connects it to contact 13. Thence, it will flow through arm 14, spring 9, and through plate 16 which is grounded.

Of course, any desired number of horns might be connected in any convenient manner to the control or button, but, in the description just preceding, it has been assumed that it was desired at the point of maximum operation of the button 8 or its equivalent, to assure a sudden increase in volume of the sound. This will obviously be effected by the operation of the second horn and an extremely pleasing result may be achieved if the horn 12 is tuned to a pitch or frequency harmonious to that to which horn 5 is tuned.

Again with such a structure, it will be desirable to prevent a turning of the button 8. This may conveniently be achieved as shown at 15 in Fig. 2 in which the button is illustrated as being irregular in outline. With the edges of the opening of numeral 7 correspondingly irregular, a turning of the button is prevented.

Having described my invention, what I now claim is:

1. A switch of a type such as is commonly applied to the steering column of a motor vehicle, said switch comprising a housing of di-electric material, a helical spiral resistance element mounted on a portion of the inner wall of said housing one end of said resistance adapted for a terminal connection, a base of electric conductive material secured to one end of said housing, an opening in the other end of said housing, a di-electric button actuator positioned and movable in said housing and extending through said opening, a contact arm engaging the housing side wall affixed to the housing side of said button and normally out of engagement with said resistance but when depressed adapted to engage said resistance, a spring positioned inside of said housing, between and electrically connecting said contact arm and base, said spring holding said button in normal position with said contact out of engagement with said resistance but permitting depression of said button thereby completing an electrical circuit through said base spring, contact and resistance.

2. A switch of a type such as is commonly applied to the steering column of a motor vehicle, said switch comprising a housing of di-electric material, a helical spiral resistance element mounted on a portion of the inner wall of said housing one end of said resistance adapted for a terminal connection, a base of electric conductive material secured to one end of said housing, an opening in the other end of said housing, a di-electric button actuator positioned and movable in said housing and extending through said opening, a contact arm engaging the housing side wall affixed to the housing side of said button and normally out of engagement with said resistance but when depressed adapted to engage said resistance, a further contact arm also secured to the housing side of said button and out of engagement with the side wall of said housing, a spring positioned inside of said housing, between and electrically connecting said contact arm and base, said spring holding said button in normal position with said contact out of engagement with said resistance but permitting depression of said button thereby completing an electrical circuit through said base spring, contact and resistance, and a further contact member adapted to be engaged by said further contact arm when said button has been depressed to its maximum extent thereby completing a further electrical circuit through said base, spring and further contact.

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