Oct. 27, 1931. J. M. AUFIERO 1,829,494

MOTOR HORN

Filed Nov. 12, 1926

Fig. 1.

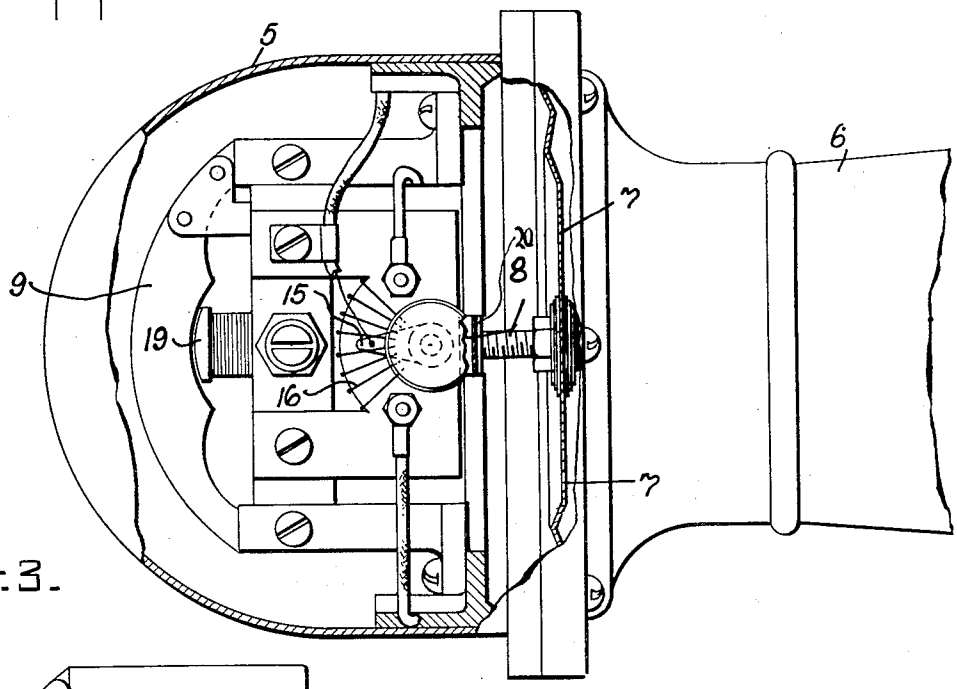


Fig. 3.

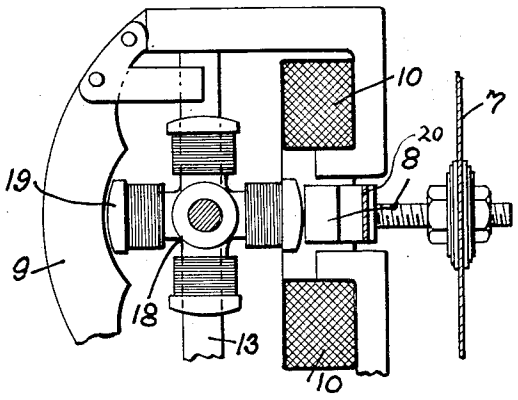
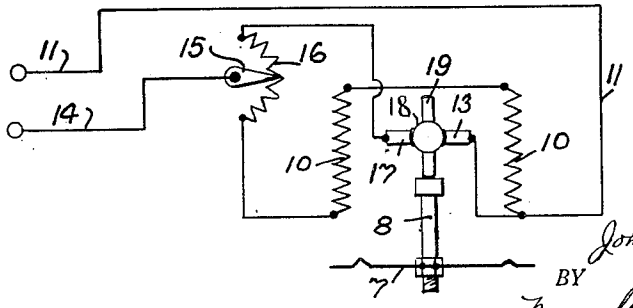


Fig. 2



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UNITED STATES PATENT OFFICE

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MOTOR HORN

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This invention relates to an improved type of acoustical signalling device.

It is an object of the invention to provide a device of this character the operation of which may be varied to compensate for differences in manufacture and material, as well as installation, and especially applied voltages, so that uniformly desirable results may be achieved by the use of a number of devices constructed in accordance with the teachings of the present invention.

Another object is to provide a device of this character which may be set by the user at some one of several different adjustments, so that thereafter (until the user desires to change the adjustment) each actuation of the device will always produce a signal note of the same uniform pitch and volume.

A further object is that of providing an acoustical signalling device which may be used to advantage in numerous different associations, and the parts of which will be comparatively few in number and rugged and simple in construction, so that the product may be manufactured and assembled at a correspondingly low figure and will operate over long periods of time with freedom from mechanical and electrical difficulties.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevation of the rear portion of a horn and showing parts of the case broken away to disclose underlying construction;

Fig. 2 is a diagrammatic view of the horn-operating mechanism and showing the circuit utilized; and

Fig. 3 is a fragmentary side elevation of the sound-producing mechanism.

In Fig. 1 the numeral 5 indicates a motor casing, from the forward end of which a trumpet 6 extends, a diaphragm 7 being suitably secured between these members. Attached to the diaphragm is an armature-plunger 8, which, when moved, correspondingly moves the diaphragm, the latter being placed under tension if so desired, and offering maximum resistance to inward movement, all of which has been disclosed in prior application Serial No. 25,741, filed April 25, 1925.

As also disclosed in this prior application, a motor is positioned within the casing 5, and in the present instance this motor is of the shunt type including a magnet 9 and a field 10. A lead 11 is connected with a source of power and extends to a brush 13 and one end of the coil 10, a second lead 14 being connected with the contact arm 15 of a rheostat-resistance 16. One end of this resistance is connected with a second brush 17, and the opposite end thereof is connected with that end of the coil 10 opposite the one with which the lead 11 is connected. The brushes 13 and 17 are in electrical contact with the commutator 18 of a rotary armature 19, and thus it will be obvious that this armature will rotate as current, controlled by the usual push-button (not shown), passes through the leads 11 and 14, and the speed of this rotation may be varied by varying the rheostat to feed a greater or smaller amount of current to the field, while feeding a correspondingly smaller or greater amount of current to the armature. It will be noticed that there is continuous metallic contact throughout said resistance 16 and to the two wires connected to the ends thereof; and that said arm 15 will remain "set" in any position of adjustment until the user desires to readjust it.

The armature-plunger 8 extends within the field coil 10 and is acted upon thereby, this plunger also extending closely adjacent the path of travel of the arms of the armature 19. As a consequence, it will be under-

stood that during the operation of a motor of the type disclosed the field force fluctuates, and the armature 8 will be vibrated due to the varying magnetic force. This will follow for the reason that the plunger 8 will be moved toward the rear of the casing when a maximum flow of current is passing through the coil 10, and will be returned to its normal position under minimum current flow through this field—such return being assured under the urging of the diaphragm, the tension and/or resiliency of which may be supplemented by a spring 20 acting upon the stem of the armature 8.

The change of magnetic force causing this result will occur according to the speed of rotation of the armature 19, and under normal current flow through the leads 11 and 14 will be of sufficient frequency to cause the diaphragm to be vibrated to produce a warning tone of proper pitch and volume.

If, however, such signal—due to variation of material or in manufacture or in strength of current-supply—does not meet the requirements of the user, it will be obvious that, according to the present invention, the pitch and volume of the tone may be changed by varying the position of the rheostat arm. This action will result in a corresponding variation of the "R. P. M." of the armature 19 and a corresponding change in pitch of the sound generated. Further, by varying the rheostat the intensity of the magnetic field of the coil will be altered to correspondingly vary the amount of deflection to which the diaphragm is subjected. Accordingly, the operation of the signal may be adjusted so that thereafter it will exactly meet the requirements of the person operating the same.

Thus, among others, the objects of this invention have been accomplished, and since certain changes may be made in the above construction, and different embodiments of the invention could be made, without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An electrical signalling device comprising a diaphragm, a magnetic plunger attached to said diaphragm, a motor armature and a motor field pole in such magnetic relation to said plunger that it vibrates upon rotation of said armature at a speed which is a function of the speed of rotation of the armature and with an amplitude of motion proportional to the combined magnetic force exerted on it by said armature and said field pole, and means for varying the speed of rotation of said armature to change the frequency of vibration of said plunger while holding the combined magnetic force exerted by said armature and said field pole on said plunger substantially constant.

2. An electrical signalling device comprising a diaphragm, a magnetic plunger attached to said diaphragm, a motor armature and a motor field pole in such magnetic relation to said plunger that it vibrates upon rotation of said armature at a speed which is a function of the speed of rotation of the armature and with an amplitude of motion proportional to the combined magnetic force exerted on it by said armature and said field pole, an electrical energy source connected to the windings of said armature and said field pole, and means for varying the speed of rotation of said armature to change the frequency of vibration of said plunger while holding the total current drawn by the windings of said armature and said field pole from said energy source substantially constant.

3. An electrical signalling device comprising a diaphragm, a magnetic plunger attached to said diaphragm, a motor armature and a motor field pole in such magnetic relation to said plunger that it vibrates upon rotation of said armature at a speed which is a function of the speed of rotation of the armature and with an amplitude of motion proportional to the combined magnetic force exerted on it by said armature and said field pole, an electrical energy source connected to the windings of said armature and said field pole, and means for adjusting the vibrational frequency of said plunger by increasing or decreasing the energy from said source through the windings of said armature whereby the speed of rotation of said armature and its magnetic force increases or decreases while simultaneously decreasing or increasing the current from said source through the windings of said pole whereby its magnetic force decreases or increases.

4. An electrical signalling device comprising a diaphragm, a magnetic plunger attached to said diaphragm, a motor armature and a motor field pole in such magnetic relation to said plunger that it vibrates upon rotation of said armature at a speed which is a function of the speed of rotation of the armature and with an amplitude of motion proportional to the combined force exerted on it by said armature and said field pole, a winding from said armature and a winding from said field pole, one end of each of said windings being connected together and to one side of said energy source, a potentiom-

eter resistance having one of its ends connected to the free end of said winding of said armature, having the other of its ends connected to the free winding for said field pole and having its movable arm connected to the other side of said energy source whereby upon movement of said arm the electrical energy to said armature changes and as a result the speed of rotation and magnetic force thereof changes but the total electrical resistance of the circuit of the device remains substantially constant so the frequency of vibration of said diaphragm may be adjusted while holding the total magnetic force acting on said plunger substantially constant.

In testimony whereof I affix my signature, in the presence of two witnesses.

JOHN M. AUFIERO.