F. SCOGNAMILLO.

WARNING SIGNAL.

APPLICATION FILED OCT. 11, 1913.

1,237,105. Patented Aug. 14, 1917.

Fig. 1.

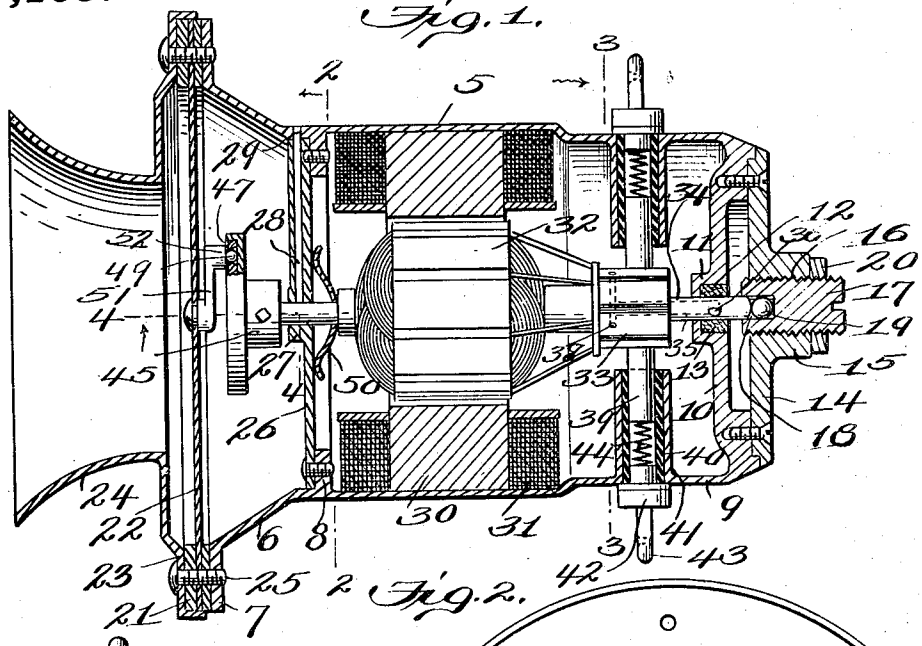

Fig. 2.

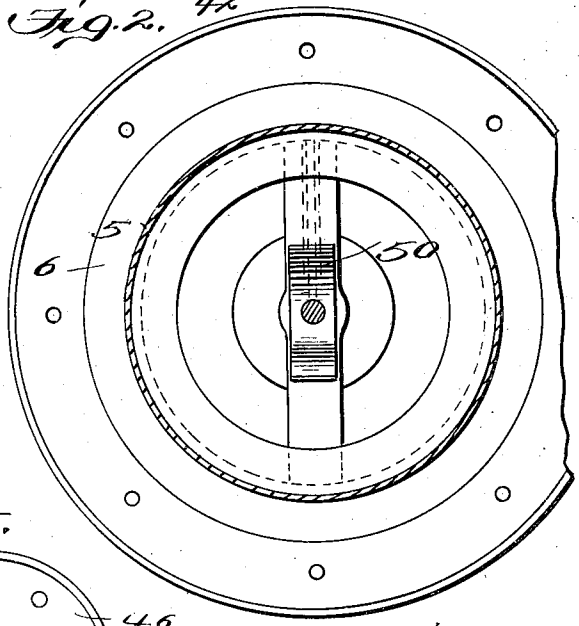

Fig. 3.

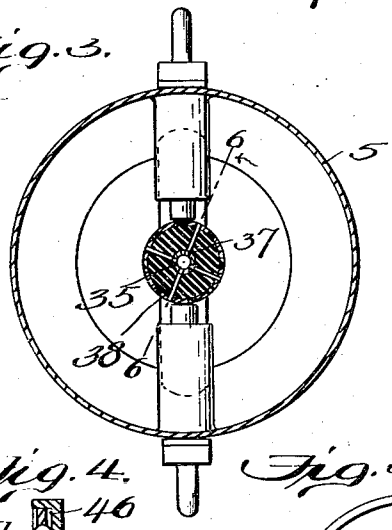

Fig. 4.

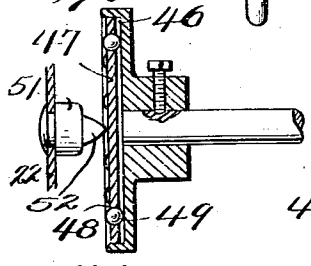

Fig. 5.

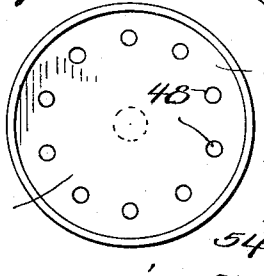

Fig. 6.

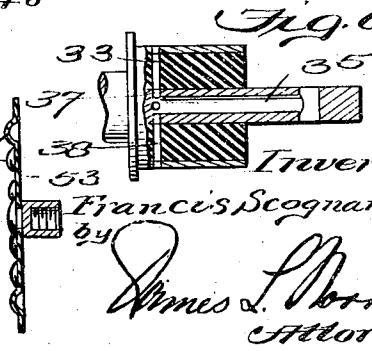

Fig. 7.

Witnesses

Chas. S. Hyer.

Inventor

Francis Scognamillo

by

James L. Norris.

Attorney.

UNITED STATES PATENT OFFICE.

FRANCIS SCOGNAMILLO, OF NEW YORK, N. Y.

WARNING-SIGNAL.

1,237,105. Specification of Letters Patent. Patented Aug. 14, 1917.

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To all whom it may concern:

Be it known that I, FRANCIS SCOGNAMILLO, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Warning-Signals, of which the following is a specification.

This invention relates to signal apparatus or horns for automobiles and other devices, and the primary object of the invention is to provide a signal apparatus or horn of the electric motor operated type with means for automatically regulating the contact pressure between the device for vibrating the diaphragm and the latter through the medium of magnetism within the motor in accordance with the strength of the applied electric current and thereby control the intensity of the signal or sound. A further object of the invention is to provide a signal apparatus or horn of the electric motor operated type with means for automatically shifting the armature and to mount the device for vibrating the diaphragm on the armature shaft and to normally set the armature relatively to the pole pieces so that when the current is supplied to the pole pieces or field magnets the armature will be shifted longitudinally relatively to the said pole pieces and thereby modify the pressure of the device for vibrating the diaphragm against the latter. A further object of the invention is to provide novel lubricating means in relation to portions of the armature shaft and the commutator so that brushes of a particular form and continually held in engagement with the commutator will be suitably lubricated so that the commutator will move between the brushes in a sensitive manner without unduly wearing the parts of the commutator or setting up a disadvantageous friction. A still further object of the invention is to provide a projecting contact arm in connection with the diaphragm to receive the impact of the device for vibrating the diaphragm and permitting the motor and its armature to be disposed in the center of the casing instead of in eccentric relation to the latter as in well known forms of signal apparatus of a kindred nature, the arm also serving to assist in the vibration of the diaphragm to a material extent and increase the sound or tone given forth. A still further object of the invention is to provide a signal apparatus or horn of the electric motor type having a generally increased efficiency and comparatively simple structure as well as embodying an organization of elements of a strong and durable character.

With these and other objects and advantages in view the invention consists in the construction and arrangement of the several parts which will be more fully hereinafter described and claimed.

In the drawing:

Figure 1 is a longitudinal vertical section of signal apparatus or an automobile horn embodying the features of the invention.

Fig. 2 is a transverse vertical section taken in the plane of the line 2—2, Fig. 1, looking in the direction of the arrow.

Fig. 3 is a transverse vertical section taken in the plane of the line 3—3, Fig. 1, looking in the direction of the arrow.

Fig. 4 is a section taken in the plane of the line 4—4, Fig. 1.

Fig. 5 is a detail front elevation of the disk or vibrating device for the diaphragm.

Fig. 6 is a section taken in the plane of the line 6—6, Fig. 3.

Fig. 7 is a detail view showing a modification of the disk or vibrating device.

The numeral 5 designates a casing which may be constructed in any suitable manner and preferably of metal and has a front flaring extremity 6 terminating in a flange 7, the said casing adjacent to the front flaring extremity 6 also having an internal annular flange 8. The rear portion of the casing 5, as at 9, is slightly reduced in diameter and is provided with a cross-brace or bearing support 10 formed with a center bearing 11 having a lubricating pocket 12 in which a suitable lubricating material 13 is disposed. Secured over the rear end of the casing 5 is a head plate 14 formed with a central enlargement 15 having a screw-threaded bore 16 in which an adjusting plug 17 is mounted and serves as a shiftable bearing, the said plug or bearing being formed with a socket 18 at its inner end, and in this socket a suitable ball-bearing 19 is mounted. The outer end of the plug or adjustable bearing 17 is constructed for application thereto of a screw-driver or analogous device and is engaged by a set nut 20 to fix the adjustment thereof. The socket 18 of the plug or adjustable bearing 17 is in longitudinal alinement with the center of the pocket 12 for a purpose which will be presently explained.

Against the flange 7 at the opposite end of the casing 5 an annular diaphragm holder 21 carrying a diaphragm 22 is applied, and over the said holder the surrounding flange 23 of a resonator 24 is fitted, as shown, and securing fastenings or screws 25 are then inserted through the flange 23 and holder 21, the diaphragm 22 and the flange 7. Secured to the annular flange 8 is a bearing brace 26 having a center bearing 27, the lubricating aperture 28 extending thereinto and continuing outwardly through a portion of the brace and coinciding with an opening 29 in the adjacent portion of the casing 5 for the reception of any suitable lubricant.

Between the flange 8 and the rear reduced portion 9 of the casing, pole pieces or field magnets 30 of any suitable construction are arranged and provided with windings 31 as in ordinary devices of this class, and within the said pole pieces an armature 32 is rotatably mounted and provided with a commutator 33 and a shaft 34 projecting at opposite extremities beyond the forward end of the armature and the said commutator. The rear extremity of the shaft 34 is inserted through the center bearing 11 and pocket 12 and extends into the plug or adjustable bearing 17, the rear end of the said commutator shaft being adapted to engage the ball bearing 19. The rear extremity of the shaft 34 is bored out longitudinally for a portion of its length to form a duct or conduit 35, and communicating with the rear extremity of this duct or conduit are feed openings 36 which are exposed to the lubricant 13 in the pocket 12. The duct or conduit 35 terminates at its forward extremity adjacent to the front terminal of the commutator 33 and has a plurality of openings 37, as shown by Fig. 3, the said openings 37 coinciding with radial ports 38 formed in the commutator and opening out through the surface of the latter at various points to distribute or feed the lubricant to the said surface of the commutator. The commutator 33 is engaged by radial brushes consisting of movable rods or members 39 mounted in insulating tubes 40 secured in sleeves 41 extending inwardly at diametrically opposite points from the interior of the rear reduced portion 9 of the casing. In the outer ends of the tubes 40 binding posts or conducting devices 42 are secured and have outer post members 43 to which the terminals of a battery or other source of electricity are adapted to be secured. Between the inner ends of the posts 42 and the outer ends of the movable brushes 39 springs 44 are introduced and operate to press the brushes inwardly and maintain a constant engagement thereof with relation to the commutator 33. It will be seen that the springs 44 act as conducting devices between the posts 42 and the brushes 39, it being understood that the latter are of suitable conducting metal.

The forward extremity of the armature shaft 34 is mounted in and extends through the bearing 27 of the brace 26, and thereon is secured a rotating head or diaphragm vibrating device 45 which has an outer recessed or channeled face 46 in which is secured a retention plate or disk 47 provided with a plurality of openings 48 having balls 49 held therein and against the inner wall of the recessed or channeled face of the said vibrating device, as clearly shown by Figs. 4 and 5. The retention plate 47 is secured as shown by means of screws or other suitable fastenings that may be removed to permit the balls 49 to be replaced as may be desired. Between the front end of the armature 32 and the cross-brace 26 a flat spring 50 is introduced and is bowed rearwardly, the front extremity of the armature shaft 34 extending through the said spring. This spring 50 operates to force the armature with its shaft and the commutator in a rearward direction when the current is cut off from the post members 43 of the binding posts 42. The armature 32 together with the shaft 34 and commutator 33 are set back a slight distance with relation to the pole pieces 30, as clearly shown by Fig. 1, but the moment the electric current is permitted to flow through the brush members 43 the magnetism of the pole pieces which is set up by the operation of the motor causes the armature with its shaft and commutator to be drawn forwardly against the resistance of the spring 50 and during such movement the inner ends of the brushes 39 spread the lubricant over the commutator and the wear on the brushes as well as the commutator is thus materially reduced and at the same time the friction due to rotation of the commutator is also reduced. The longitudinal movement of the armature and its shaft may be readily governed as to distance by adjusting the plug 17, and by this means the vibrating pressure of the vibrating device or head 45 relatively to the diaphragm may be easily regulated.

To the center of the diaphragm 22 one end of an arm 51 is secured, the said arm projecting eccentrically and clear of the rear portion of the diaphragm and having a head or contact projection 52 for engagement by the balls 49 of the head or device 45, and by this means the diaphragm may be positively and reliably vibrated with greater advantage in the production of a signal or sound and without requiring the motor and the devices hereinbefore described to be eccentrically disposed with relation to the diaphragm.

From the foregoing the operation of the improved signaling apparatus or horn will be readily understood and it is evident that

by modifying the strength or potency of the current the pressure of the head 45 relatively to the projection 52 of the arm 51 of the diaphragm may be varied so as to give forth a differentiating tone or signaling sound, or the adjustment may be preliminarily made in such manner that a comparatively light current sufficiently strong to operate the motor may give a strong pressure contact and thus also modify the tone or signaling sound. The adjustment as well as the variation of the tone or signaling sound may be readily effected to accommodate the use on an automobile or other vehicle in certain localities or under particular conditions where a change of signal tone or sound may be necessary.

Fig. 7 illustrates a rotary disk or vibrating device for the diaphragm consisting of sheet steel or other metal plate 53 having stamped projections 54 of hemispherical form to take the place of the fixed balls heretofore described.

It will be understood that changes in the proportions, dimensions and minor details may be resorted to to accommodate various applications of the improved signaling apparatus or horn without departing from the scope of the claims.

What is claimed is:

1. In a horn of the class specified, a casing with a partition wall dividing the front portion thereof to form a diaphragm inclosure, a diaphragm within the inclosure in advance of the partition wall, a resonator opening into the front of said inclosure in advance of the diaphragm, a motor comprising a rotor and shaft shiftably mounted in rear of the partition wall, the said shaft extending through the center of said wall in alinement with the center of the diaphragm, means for controlling and regulating the movement of the shaft and rotor, an arm having one end connected to the center of the diaphragm and eccentrically projected in relation to the diaphragm, and an actuator on the front end of the shaft in line with the center of the diaphragm and provided with a recessed front face having a disk secured therein at a distance inwardly from the front edge of the actuator and provided with a plurality of openings around the center thereof in which balls are held to loosely rotate by the disk against the rear wall of the recess for engagement by the projected portion of the arm carried by the diaphragm.

2. In a horn of the class specified, the combination of a casing, a motor disposed in the center of the casing and having a shaft, a diaphragm mounted in the casing, a rotating device fixed to the front end of the shaft of the motor and having a recessed front face with a disk removably mounted therein and formed with a plurality of apertures around the center, balls held in the apertures of the disk and against the rear wall of the recessed face of the rotating device, the apertures of the disk having diameters less than the maximum diameters of the balls so that only a portion of the balls will project outwardly beyond the surface of the disk, the balls directly and loosely bearing against the rear wall of the recessed face of the rotating device and having independent rotating movements in the disk, the center of the rotating device being in alinement with the center of the diaphragm so that the balls of the rotating device will travel around the center of the diaphragm, and an arm having one end secured to the center of the diaphragm and projecting eccentrically from its secured end and clear of the rear portion of the diaphragm between the rotating device and the diaphragm, the arm having a head to engage the balls of the rotating device, the shaft being longitudinally shiftable relatively to the diaphragm to vary the vibration of the latter through the operation of the rotating device and pressure engagement thereof with respect to the eccentrically projecting portion of the said arm.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANCIS SCOGNAMILLO.

Witnesses:

JOHN PERICONI,

R. GRASS.