W. SPARKS.

SIGNAL.

APPLICATION FILED OCT. 8, 1915.

1,227,084.

Patented May 22, 1917.

FIG. 1.

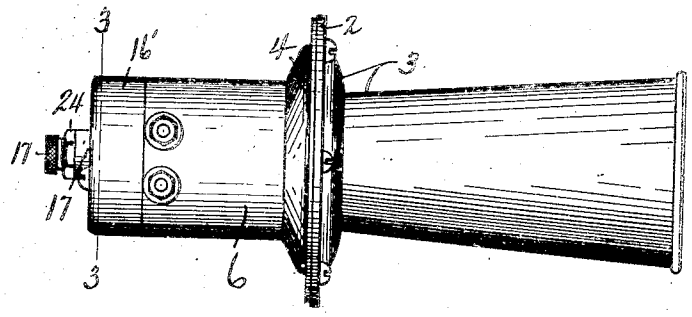


FIG. 2.

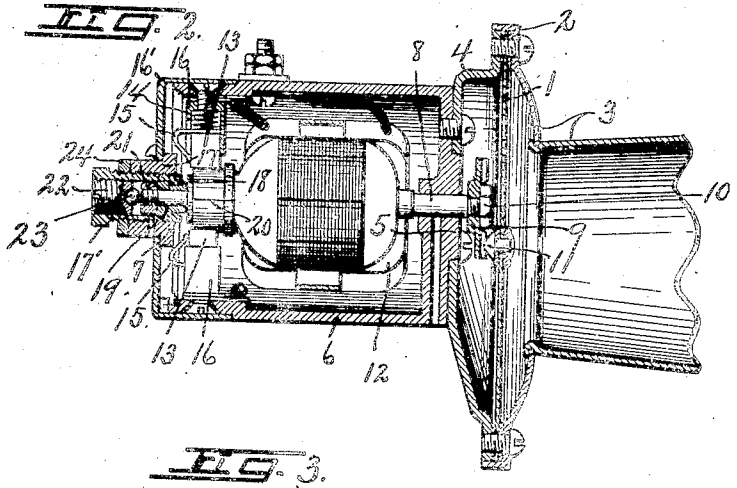
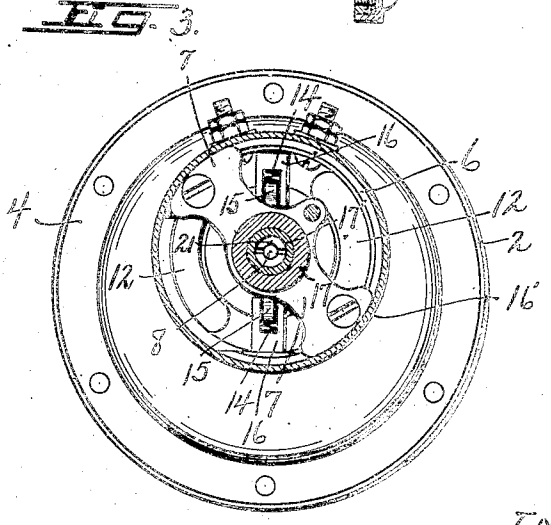


FIG. 3.



WITNESSES:

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SIGNAL.

1,227,084. Specification of Letters Patent. Patented May 22, 1917.

Application filed October 8, 1915. Serial No. 54,735.

To all whom it may concern:

Be it known that I, WILLIAM SPARKS, a citizen of the United States of America, and resident of Jackson, in the county of Jackson, in the State of Michigan, have invented new and useful Improvements in Signals, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in signals, and more particularly to cam operated signals of the diaphragm type, and in which the cam is mounted upon the shaft of a rotary electric motor positioned endwise toward and at the rear of the diaphragm.

In this type of signal it becomes advisable to provide means of adjustment for the armature shaft so as to vary the spaced distance of the cam from the diaphragm to properly position the parts for producing the most efficient signal or alarm.

Further, in the commercial manufacture of armature shafts and bearings therefor, it is extremely difficult, if not practically impossible, to produce the parts with such exactness so that they may be correlated in a structure without the necessity of adjustment to account for the variance in size, both as originally produced and as resulting from wear consequent to use.

The object, therefore, of this invention is to provide an adjustable bearing for the armature shaft of the motor whereby the shaft is firmly held from longitudinal movement and the clatter consequent to such movement prevented, and at the same time providing means of positive adjustment for the armature shaft longitudinally in both directions and for properly assembling the parts in the process of manufacture, irrespective of slight variances in size.

Other objects and uses will appear from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a bottom plan view of the signal.

Fig. 2 is a longitudinal cross section of the signal inverted.

Fig. 3 is a cross section on line 3—3, Fig. 1.

The device comprises a vibratory diaphragm —1— having its marginal edge clamped between the base —2— of an amplifier —3— and a ring —4— having a circular opening eccentrically disposed with respect to the diaphragm —1— for the reception of a boss —5— formed upon the end of a cup-shaped motor casing —6— having its rear end partially closed by a transverse bar —7— carrying a bearing for an armature shaft —8— having its opposite end journaled in the end wall of the case —6— and projecting into the chamber formed between the diaphragm —1— and ring —4—, and a suitable toothed actuator —9— is secured upon this end of the motor shaft in any suitable way, as by nut —10—, the teeth of which actuator are adapted to contact with a wear-piece or projection —11— upon the diaphragm for forcing vibration of the latter as the toothed actuator is rotated.

The case —6— may be secured to the ring —4— in any suitable way, as by screws —11′—, and carries suitable pole pieces and field coils, indicated at —12—. The commutator brushes —13—, the springs —14—, the conductors —15— and the guides or boxes —16— are similar to those shown in my co-pending application, Serial No. 861,220.

The rear open end of the case —6— is adapted to be closed by a cap —16′— having a central opening for receiving an internally threaded boss —17— formed upon the cross bar —7—. The internally threaded boss —17— is substantially axially disposed with respect to the case —6— and is adapted to adjustably receive an externally threaded sleeve —17′—.

The inner end of the sleeve —17′— is provided with a stepped portion —18— of less diameter than the internal diameter of the sleeve to form an internally projecting circumferential shoulder for coöperative engagement with a stepped member —19— mounted upon the end of the armature shaft near the commutator —20— and held in place by a suitable locking nut —21—.

The rear portion of the sleeve —17′— is internally threaded for the reception of a set screw —22— having a seat for receiving a rotary ball —23—, which ball in adjusted position of the set screw —22— bears against the end of the motor shaft —8— and forms an end-thrust bearing therefor.

It will be readily apparent that the set screw —22— may be adjusted to account for variance in the length of the motor

shaft and variance in the size of the other portions of the bearing to prevent longitudinal movement of the shaft —8— in either direction, and that the sleeve —17'— may be adjusted through the bar —7— to adjust the armature shaft and bearing longitudinally in both directions to vary the overlap of the cam surfaces or teeth of the actuator —10— on the wear-piece —11— and such sleeve may be locked in any desired position of adjustment by a lock nut —24—.

Although I have shown and described one particular construction and method of operation and adjustment of the parts, I do not desire to limit myself to the same, as changes may be made in the details of construction and operation without departing from the spirit of this invention as set forth in the appended claims.

What I claim is:

1. In a signal, a diaphragm, an electric motor having its armature shaft presented endwise toward the diaphragm, a rotor mounted upon said shaft adjacent the diaphragm, and an end-thrust bearing for the armature shaft for positively moving said shaft toward and from the diaphragm independently of the body of the motor.

2. In a signal, a diaphragm, an electric motor having its armature shaft presented endwise toward the diaphragm, a rotor mounted upon said shaft adjacent the diaphragm, an adjustable sleeve, and an end-thrust bearing for said motor having an adjustable relation with said sleeve for positively holding the motor shaft in a predetermined position relatively to said sleeve.

3. In a signal, a diaphragm having a wear-piece associated therewith, an electric motor having its armature shaft presented endwise toward the diaphragm, a rotor carried by said motor shaft for contact with said wear-piece, a transverse bar at the rear of the motor, said bar having a tubular boss, a sleeve adjustable through said boss, said sleeve having an inwardly projecting radial shoulder, the armature shaft provided with a stepped member for engagement with said shoulder, and an adjustable set screw for holding said stepped member in substantial contact with said shoulder.

4. In a signal, a diaphragm, an electric motor, a rotor mounted upon the armature shaft of said motor, and an end-thrust bearing for the armature shaft for positively reciprocating said shaft independently of the body of the motor.

5. In a signal, a diaphragm having a wear-piece associated therewith, an electric motor having its armature shaft presented endwise toward the diaphragm, a rotor mounted upon said shaft for contact with said wear-piece, a sleeve adjustable toward and from the diaphragm, and adjustable means associated with the sleeve for causing the motor shaft to move in conjunction with the sleeve.

6. In a signal, a motor embodying an armature shaft and an inclosing shell, an actuator mounted on the motor shaft, a diaphragm having a projection positioned in the path of movement of the actuator, a sleeve adjustable through the shell, and an end-thrust bearing for the motor shaft having a threaded relation with said sleeve.

7. In a signal, a motor embodying an armature shaft and an inclosing shell, an actuator mounted on the motor shaft, a diaphragm having a projection positioned in the path of movement of the actuator, a sleeve adjustable through the shell, said sleeve provided with a radially and inwardly projecting shoulder, a member secured to the motor shaft and rotatably positioned within the sleeve, and an end-thrust bearing for the motor shaft adjustably engaged with the sleeve for holding said member on the shaft in substantial contact with said shoulder.

In witness whereof I have hereunto set my hand this 27th day of September, 1915.

WILLIAM SPARKS.

Witnesses:

LILLIAN E. WUNDERLICH,

W. J. CORBETT.