

W. M. HORTON.
ELECTRIC SIGNALING DEVICE.
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1,303,901.

Patented May 20, 1919.

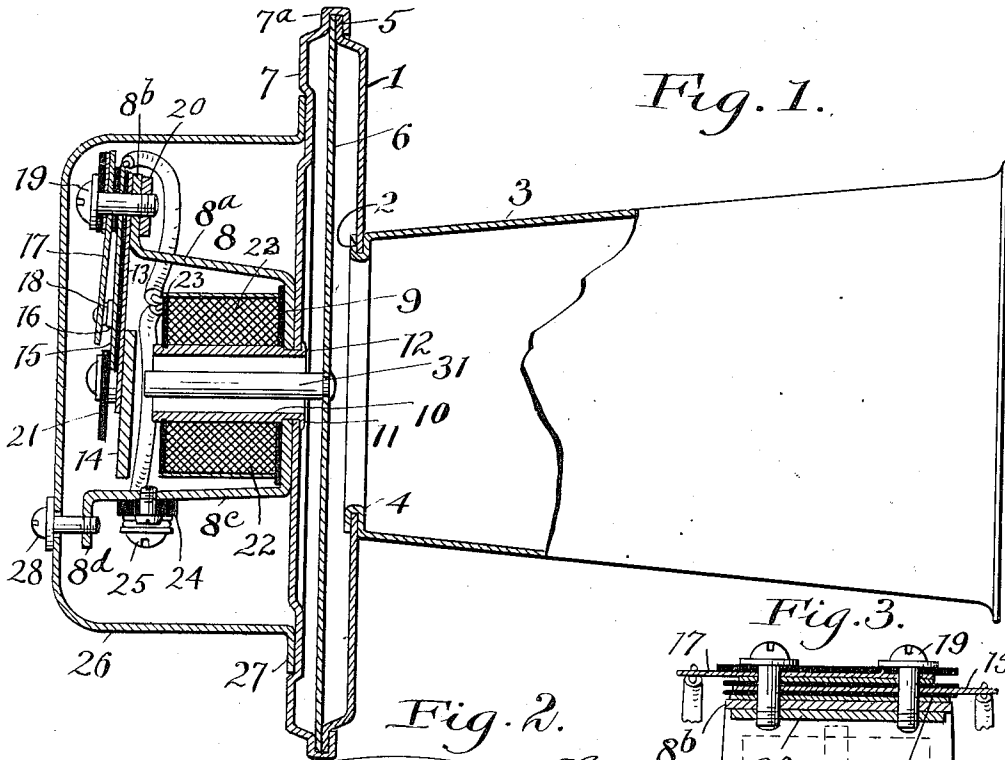


Fig. 1.

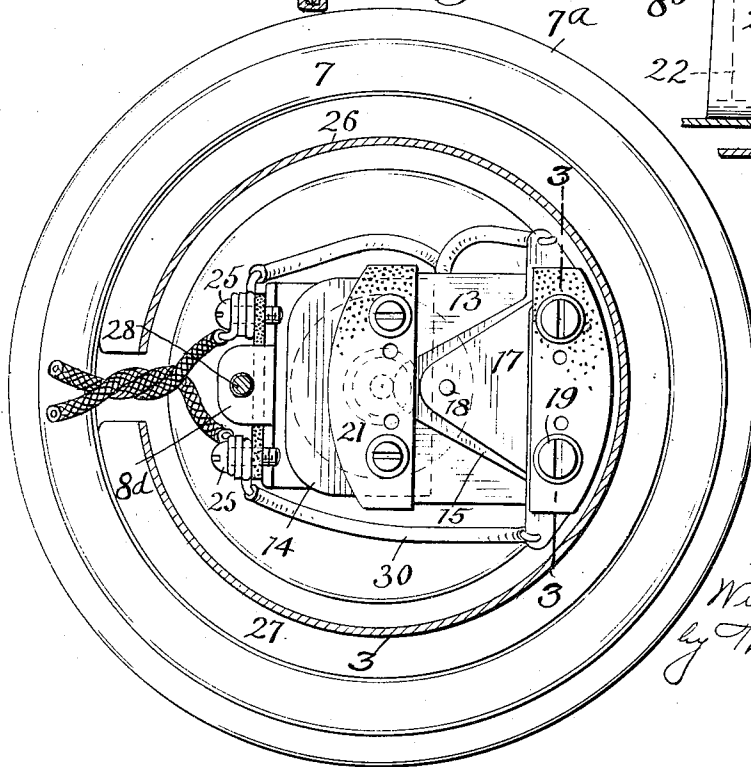


Fig. 2.

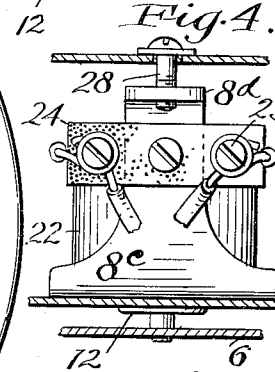
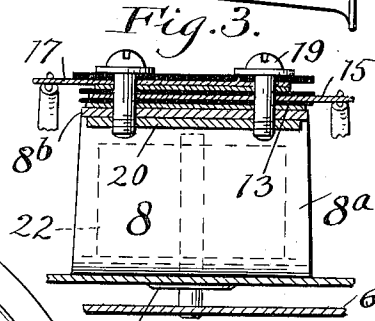


Fig. 4.

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UNITED STATES PATENT OFFICE.

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ELECTRIC SIGNALING DEVICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM M. HORTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Electric Signaling Devices, of which the following is a full, clear, and exact description.

This invention relates to an electrically operated signaling device, commercially termed a horn, wherein a solenoid and armature are electrically energized, and cause a series of blows to be imparted to a diaphragm.

The object of the invention is to provide a horn of the character described, wherein the construction is simple and may be manufactured at a low cost.

Generally speaking, the invention may be said to comprise the elements and combinations thereof set forth in the accompanying claims.

Reference should be had to the accompanying drawings forming a part of this specification, in which Figure 1 is a side elevation with portions in section; Fig. 2 is an end elevation showing the casing which houses the working parts of the horn sections; Fig. 3 is a section on the line 3—3 of Fig. 2; Fig. 4 is a side elevation with parts in section showing a portion of the construction of the horn.

The horn comprises a base plate 1, which is formed with a central opening indicated at 2. This opening is adapted to receive an amplifier 3, the amplifier being fastened to the base plate 1 in the opening by pressing the edge of the amplifier around the base as indicated at 4 in Fig. 1.

The base is provided with an upturned portion indicated at 5, and upon this upturned portion there is laid a diaphragm 6.

There is also provided a supporting plate 7, which at its outer edge is folded around the portion 5 of the base 1, and also bears against the diaphragm 6 adjacent the edge thereof, so that when the portion 7^a is folded as indicated in the drawing the support 7, the base 1, and the diaphragm are held together as a unitary structure.

At substantially the center of the supporting plate 7 there is mounted a part of the electromagnet which is generally represented at 8. This part 8 of the electromagnet not only serves to provide an iron body through which the flux generated as the coil of the electromagnet is energized, but also serves to support certain parts of the working mechanism of the horn.

This part 8 is formed of a strip of metal which is stamped and drawn to substantially the shape shown in Fig. 1, having the bottom portion 9 and the upturned portion 8^a and 8^c. There is a bottom portion 9 which rests against the supporting plate 7. This portion 9 is provided with an opening which registers in a similar opening in a supporting plate 7 and through the two openings there extends a cylindrical member 10 which has a shoulder indicated at 11, which shoulder engages with the bottom 9. After this cylindrical member 10 is inserted through the openings as described, the end of the pipe is turned up as indicated at 12, thus holding the member 8 and the cylindrical member 10 firmly connected with the supporting plate 7.

The member 8 is provided with an outwardly extending portion 8^a, and with a ledge or table portion 8^b. At its forward end the member 8 is provided with an upwardly extending portion 8^c which also has a ledge 8^d. Upon the ledge 8^b there is supported a spring member 13 to which is secured the armature 14. Upon the spring member 13 there is a contact carrying member 15. This member is insulated from the spring member 13. This member 15 carries the contact 16.

Above the member 15 there is a spring member 17 which carries the contact 18. The several members are held to the portion 8^b by means of screws one of which is indicated at 19. These screws extend through suitable openings provided in the various members 17, 15 and 13, and the screws engage with a plate 20 which lies beneath the portion 8^b. Suitable insulating material is provided so that the screws are insulated from the spring contact member

17, and the holes in these various members through which the screws extend are sufficiently large so that the screws are out of contact with the members through the holes or openings in which the screws extend.

Upon the armature there is carried a cross member 21, and beneath this cross member the spring contact member 15 extends. This construction is provided so that the contact between the contacts 16 and 18 is positively broken by the movement of the armature toward the electromagnet.

Surrounding the tubular member 10 is a coil 22. This coil is of such size as to snugly fit upon the tube. It is insulated from the bottom 9 of the member 8, and is held on the tubular member by means of a disk 23 which is of insulating material and has a central opening that snugly fits over the tubular member 10.

The forward portion 8^c of the member 8 carries a cross member 24 which is made of insulating material and upon this cross member 24 there are two terminal screws one of which is indicated at 25.

The working parts of the horn, as thus described, are adapted to be inclosed by a cover which is indicated at 26. This cover is provided by an outwardly extending flange 27 at the lower portion which engages in a suitably formed depression in the spring plate 7. The cover is fastened by a screw 28 which extends through an opening in the cover and engages with a threaded opening formed in the portion 8^d of the member 8.

The coil 22 has one end thereof connected with the spring contact member 15, the other end of the coil being connected with one of the terminal screws such as represented at 25.

The spring contact plate 17 is by means of a conductor 30 connected with the other of the terminal screws 25.

The diaphragm 6 has secured thereon a post or pin 31, which extends substantially centrally through the tubular member 10 and is in position to be engaged by the armature as the same is attracted toward the coil when the coil is energized. This movement of the armature imparts a sharp blow to the pin 31. It is the rapid succession of blows which cause the vibration of the armature which in turn causes the emission of sound.

The member 8 is formed of a metal which has some inherent resiliency, particularly in the upturned portion 8^a. This is an important feature of the construction, for when the armature 14 is rapidly vibrated as the circuit is made and broken through the coil 22, the upturned portion 8^a provides a resilient mounting for the spring member 13,

and part of the rebound of the armature is absorbed by the member 8^a because of its resilient nature. This is of considerable assistance in lengthening the life of the spring 13, and with this construction the breaking of the spring 13 is practically eliminated. Where the mounting for the spring 13 is rigid the continued flexing of the spring 13 will eventually cause the springs to break, but with the flexible mounting proposed herein this feature is eliminated.

Having thus described my invention, I claim:—

1. An electric signaling device comprising a supporting plate, a diaphragm carried by said supporting plate, an electro-magnet carried by the said supporting plate, a portion of said electro-magnet being formed as a strip of metal which is resilient, an armature for said electro-magnet, a spring plate supporting the armature, said spring plate being in turn supported by the said strip of resilient material, means whereby the movement of the armature imparts vibration to the diaphragm, and a make and break device which opens and closes with the movement of the armature.

2. An electric signaling device comprising a supporting plate, a diaphragm carried by the supporting plate, a metal member having a bottom portion which lies against the supporting plate and upturned side portions, a coil secured between the said side portions, an armature above the coil, a spring plate supporting the armature and secured to one of the said upturned portions, means whereby the movement of the armature may be transmitted to the diaphragm.

3. An electric signaling device comprising a supporting plate, a diaphragm carried by the supporting plate, a strip metal member having a bottom portion and outwardly extending side portions, the bottom portion of said member being secured to the supporting plate, a coil located between the side portions of said member, said coil having an opening therethrough, a pin carried by the said diaphragm and extending through said opening, a platform formed on one of the extending side members, a spring supported on said platform, an armature carried by said spring and in position to impinge against the said pin, a make and break device which opens and closes with the movement of the armature.

4. An electric signaling device comprising a supporting plate, a diaphragm carried by the supporting plate, a metal member having a portion which lies against the supporting plate and portions which are bent upwardly, a wire coil secured between said upturned portions, an armature above the coil, means for resiliently supporting said arma-

ture from one of the said upturned portions
of the metal member, a cap inclosing the
parts carried by the supporting plate said
cap having a portion which fits against the
5 supporting plate, and means extending
through the cap and engaging with one of

the side portions of the metal member
whereby the cap is secured in place.

In testimony whereof I hereunto affix my
signature in the presence of two witnesses. 10

WILLIAM M. HORTON.