Oct. 14, 1924. 1,511,346

W. KAISLING

MOTOR HORN

Filed May 19, 1919 2 Sheets-Sheet 1

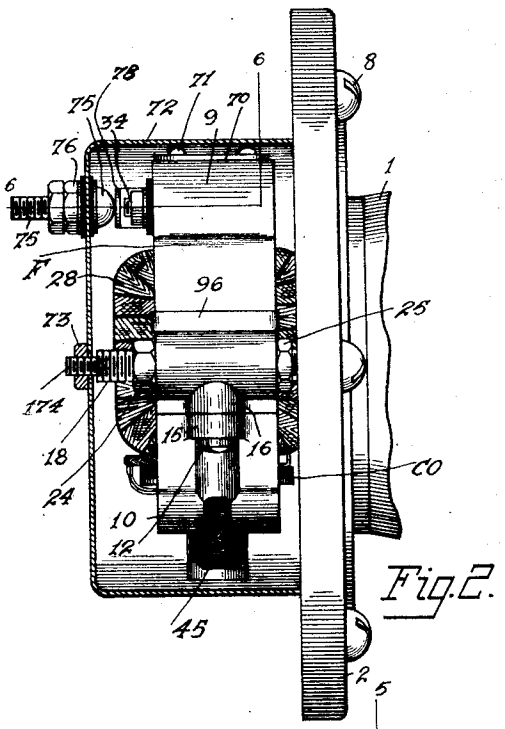

Fig. 2.

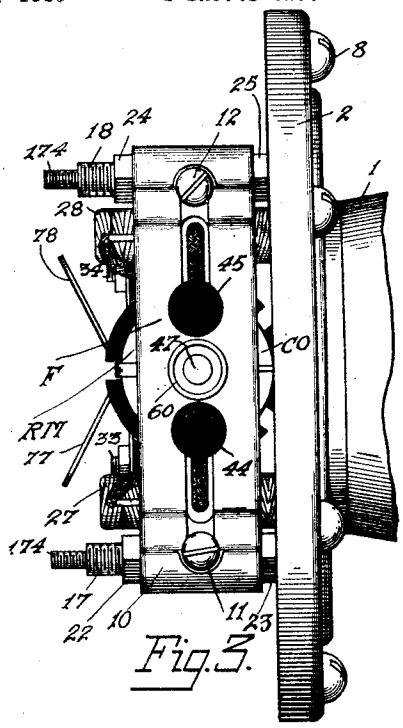

Fig. 3.

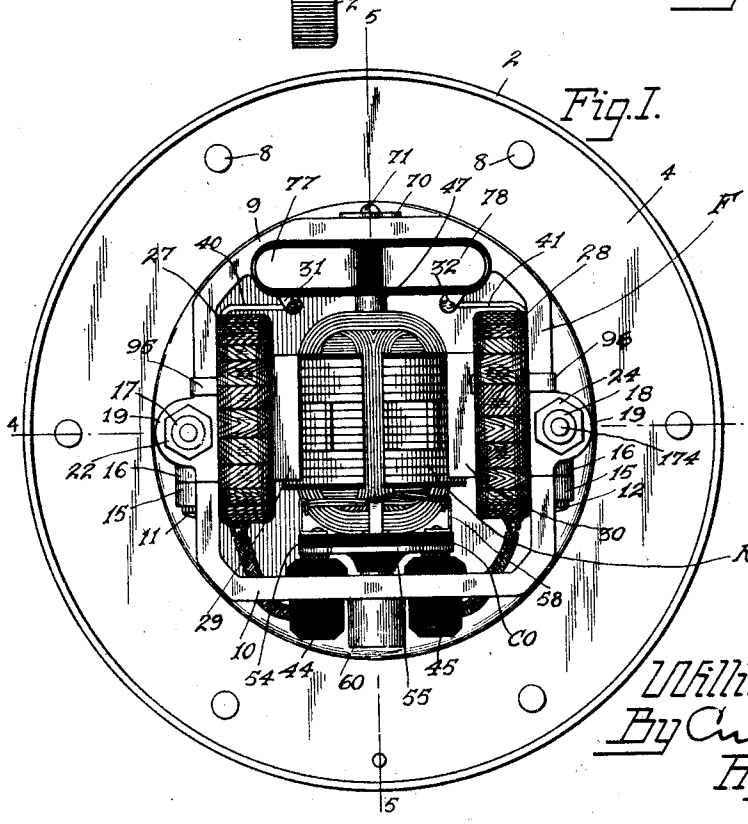

Fig. 1.

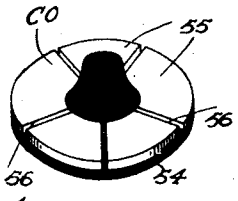

Fig. 9.

Inventor:
William Kaisling
By Curtis B. Camp.
Attorney

Oct. 14, 1924. 1,511,346

W. KAISLING

MOTOR HORN

Filed May 19, 1919 2 Sheets-Sheet 2

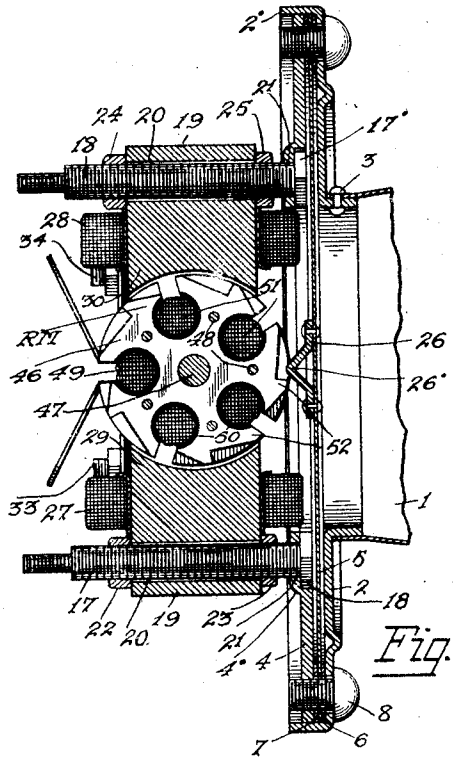

Fig. 4.

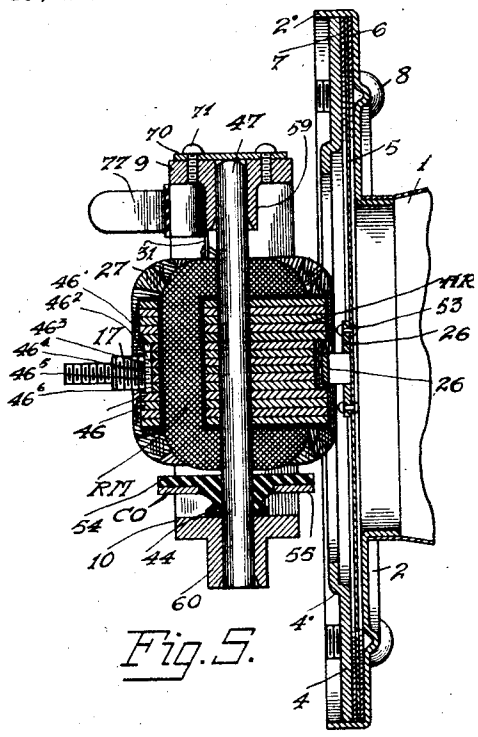

Fig. 5.

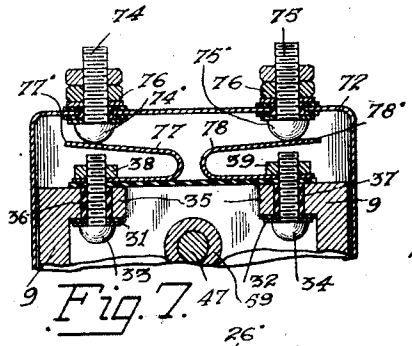

Fig. 7.

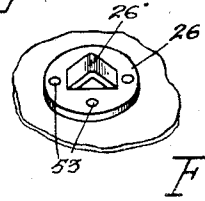

Fig. 8.

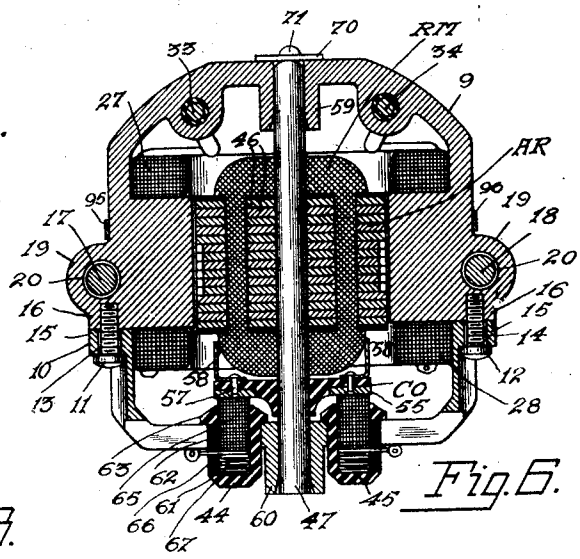

Fig. 6.

Inventor
William Kaisling
By Curtis B. Camp
Attorney

Patented Oct. 14, 1924. 1,511,346

UNITED STATES PATENT OFFICE.

WILLIAM KAISLING, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MOTOR HORN.

Application filed May 19, 1919. Serial No. 298,195.

To all whom it may concern:

Be it known that I, WILLIAM KAISLING, a citizen of the United States of America, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Motor Horns, of which the following is a specification.

My invention relates to signaling devices and has to do more particularly with signaling horns such as are usually employed as warning signals on automobiles, launches and the like.

My invention is particularly directed to electrically operated signaling horns including a vibratile member such as a diaphragm, a small rotary motor and an enclosing casing provided with a resonator or horn. The small rotary motor is located directly behind the diaphragm and its shaft is provided with a cam integrally formed with the armature of the motor and arranged in operative relation with an impact device or anvil mounted upon the rear face of the diaphragm. The motor is small and compact in construction, and consumes but little current, and may be operated from a low voltage storage battery which is now almost universally used in conjunction with the ignition system of an automobile engine.

A feature of my invention is the construction of the motor and its parts, and the arrangement of the armature upon the shaft and the means employed to prevent lateral movement of the motor.

Another feature of my invention is the novel means of connecting the external leads with the terminals of the motor, and the novel and improved form of brush holder for the motor. The motor horn of my invention is simple in construction, efficient in its operation, low in current consumption and compact in its arrangement of parts, all of which parts are readily accessible for adjustment.

A still further feature of my invention is the construction and arrangement of the field and pole-pieces of the motor. The field piece is formed out of a continuous ring which lies in a plane parallel to the plane of the diaphragm. This ring piece carries the bearings of the motor and also the brush holders, thus forming a complete unitary structure which is micrometrically adjustable relative to the diaphragm.

The above features as pointed out, as well as others, will be more fully pointed out in the ensuing specification and claims.

For a more complete understanding of my invention reference is to be had to the accompanying drawings in which like reference characters denote like parts, and in which

Fig. 1 is a rear elevation of the signaling horn, embodying my invention, shown with the protecting cap removed.

Fig. 2 is a right side elevation of Figure 1 with the protecting cap in section.

Fig. 3 is a bottom view of Figure 1.

Fig. 4 is a sectional view along the line 4—4 of Figure 1.

Fig. 5 is a sectional view along the line 5—5 of Figure 1.

Fig. 6 is a sectional view along the line 6—6 of Figure 2.

Fig. 7 is a sectional view showing the connecting means between the external terminals and the terminals of the motor.

Fig. 8 is a perspective view of the impact button or anvil carried by the diaphragm of the device of my invention; and

Fig. 9 is a perspective view of the commutator.

Referring now more in detail to my invention as illustrated, it comprises a resonating horn 1, suitably secured to the front plate 2 by means of the rivets 3. A mounting plate 4 is provided to which the apparatus as a whole is secured, as will be more fully hereinafter described. A diaphragm 5 of suitable material is placed within the cup-shaped portion 2′ of the front plate 2 with a packing ring 6 of any suitable material, such as cork, between it and the front plate 2. A packing ring 7 is then placed between the diaphragm 5 and the mounting plate 4. The front plate 2, diaphragm 5, packing rings 6 and 7 and the mounting plate 4 are thus securely clamped together by means of the screws 8.

Referring now to the small rotary motor RM, it comprises a field piece F formed of two pieces 9 and 10, which are clamped together by means of clamping screws 11 and 12 that pass through suitable openings 13 and 14 in the lugs 15 of the section 10 and have screw-threaded engagement with suitably tapped openings in the lugs 16 of the section 9. The two sections 9 and 10 when clamped together form a rectangularly shaped field piece F as most clearly illus-

trated in Figure 6. The rectangularly shaped field piece F is adjustably secured to the threaded studs 17 and 18. The field piece F is provided with lugs 19 diametrically opposite each other, and these lugs are provided with suitable openings 20 through which the studs 17 and 18 extend. The mounting plate 4 is provided with suitably tapped openings 21 which receive the threaded studs 17 and 18. The studs 17 and 18 are provided with hexagonally shaped heads 17′ and 18′ which when the studs 17 and 18 are in place engage the face of the plate 4 thus securing the studs 17 and 18 to the said plate. A pair of nuts 22 and 23 is provided for the stud 17 and likewise a pair of nuts 24 and 25 is provided for the stud 18.

To adjust the motor as a unit relative to the impact button or anvil 26 on the diaphragm 5 it is only necessary to loosen the nuts 22 and 24 on the studs 17 and 18, respectively, and turn the nuts 23 and 25 to the right or left, depending on whether it is desired to move the motor RM away or towards the anvil 26. When the motor RM as a whole is adjusted in relation to the anvil 26, the nuts 22 and 24 are tightened to securely hold it in its adjusted position. Field coils 27 and 28 are provided which are suitably mounted upon the pole pieces 29 and 30 of the frame F, and held in place upon the pole pieces 29 and 30 by means of bands 95 and 96 whose ends slip under the coils and are turned up to engage the coil to secure the same in position. The ends of the coils 27 and 28 are connected to suitable terminals as will be presently described. Terminals 31 and 32 are insulatingly mounted upon the field piece F and are secured thereto by means of screws 33 and 34 which pass through suitable openings in the lugs 35 integrally formed with the frame F. The said screws 33 and 34 are suitably insulated from the frame F by means of the insulation sleeves 36 and 37. Nuts 38 and 39 are provided which have screw-threaded engagement with the screws 33 and 34 to securely hold the terminals 31 and 32 in position. The terminals 31 and 32 serve as terminals for one end of the windings of the field coils 27 and 28, and the other ends of the windings of the coils 27 and 28 terminate in the motor brushes 44 and 45.

A laminated armature AR for the motor RM is centrally positioned between the pole pieces 29 and 30 of the field piece F, the said armature AR being built up of a plurality of disks 46 which are fitted upon the shaft 47 in any suitable manner as by means of a drive fit. The said laminations 46 are held together as a unit AR by means of the rivets 48. The armature AR has a plurality of circular openings 49 extending lengthwise of the armature into which split sleeves of insulation 50 are fastened. Windings 51 for the armature AR are contained in these insulated orifices, and the terminals of these windings all lead to sections of the commutator CO as will presently be described. Six of the armature laminations 46′, 46^2, 46^3, 46^4, 46^5, 46^6 serve the purpose of a cam, the said laminations being serrated or provided with teeth 52 for engagement with the anvil 26 of the diaphragm 5. The anvil 26 is formed out of a circular disc and has a V-shaped portion 26′ pressed out and hardened for engagement with the teeth 52 of the cam 26. The anvil 26 is suitably fastened to the center of the diaphragm 5 by means of rivets 53. The commutator CO is suitably mounted upon the shaft 47 by means of a drive fit and it comprises a disc 54 of suitable insulating material upon which are mounted the commutator segments 55. Commutator segments 55 are radially disposed upon the insulation disc 54 and are suitably spaced as indicated at 56 to properly separate them from each other. The segments 55 are secured to the disc 54 in any suitable manner as by means of the rivets 57. Each segment 55 is provided with a terminal 58 which is secured to the bottom face of the insulating disc 54 by means of the rivets 57. Each terminal 58 forms a terminal for the windings 51 of the motor armature RM.

I rotatably support the shaft 47 and its parts as a whole in bearings 59 and 60, which bearings are preferably integrally formed with the sections 9 and 10 which form the rectangularly shaped field piece F. The motor brush holders 44 and 45 are suitably supported in the section 10 of the field piece F and as both are similarly constructed I will describe holder 44 only. The brush holder 44 comprises a shell 61 of suitable insulating material the said shell fitting into a suitable opening 62 in the section 10 of the frame F. A shoulder 63 is formed upon the shell 61 which bears against the inner face of the section 10 to prevent the said shell 61 from being forced out of the opening 62. The motor brush 65 is made of any suitable material, such as wire gauze, rolled to form a brush of a size to fit in the shell 61. The lead to the brush 65 is passed through a suitable slot 66 in the shell 61 and then soldered to the said brush 65. To obtain the proper bearing pressure of the brush 65 against the commutator CO I provide a coiled spring 67 which is placed in the shell 61 behind the brush 65 and the tension of the said spring is such that the brush receives the proper bearing pressure to maintain it in engagement with the commutator segments 55. The tension of the springs 67 on the brush 44—45 is such that the shaft 47 is held against a thrust plate 70 which is suitably secured to the section 9 of the frame F by means of the screws 71, the said springs 67

holding the motor armature against lateral movement.

A suitable enclosing casing or cap 72 is provided which fits over the flanged portion 4′ of the mounting plate 4, and is held in place by means of nuts 73 which nuts have screw-threaded engagement with a reduced threaded portion 174 of the studs 17 and 18. Terminals 74 and 75 are provided which serve as terminals for the terminal leads of the motor RM, and are suitably secured to the cap 72 and suitably insulated therefrom. The said terminals 74 and 75 are held in place by means of nuts 76. Leaf springs 77 and 78 are provided which are suitably secured to the section 9 of the frame F by means of nuts 38 and suitably insulated from the frame F. The springs 77 and 78 are U-shaped and their free ends 77′ and 78′, when the cap 72 is secured in place, engage the heads 74′ and 75′ of the screws 74 and 75. The said free ends 77′ and 78′ of the springs 77 and 78 are forced down against their normal tension when the cap 72 is in place, due to the fact that they engage the heads 74′ and 75′, thus providing a connection means from the external terminal connections 74 and 75 to the internal terminals 31 and 32.

In assembling the horn and attuning it, the nuts 22, 23, 24 and 25 are loosened, so as to permit the entire motor to slide along the studs 17 and 18 to or from the diaphragm 5, and when the desired tone has been developed, the nuts 22, 23, 24 and 25 may be set to lock the motor in its adjusted position.

From the foregoing description it is to be noted that I have provided a very efficient motor that is very compact and takes up very little space. By arranging the field and armature of the motor in a plane parallel to the diaphragm, and by forming the agitator integrally with the armature I am able to mount the motor concentrically and in the least possible space.

While the invention has been described with particular reference to the details of construction, it should be understood that it is not limited thereto, as many changes and modifications may be made therein without departing therefrom, and I therefore wish to cover all such changes and modifications that come within the scope and spirit of the appended claims.

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

1. A device of the character described, comprising a mounting plate, a diaphragm secured thereto carrying a centrally located wear member, a motor provided with a field piece, a shaft for said motor journaled in the field piece and carrying a laminated armature provided with a centrally located striker formed from the laminæ to engage the wear member, means carried by the mounting plate for adjustably supporting and maintaining the motor parallel to the diaphragm, a disc commutator carried by the armature, brushes carried by the field piece and engaged with the commutator, a thrust bearing secured to the field piece and arranged to prevent endwise movement of the shaft in one direction, and means acting on the brushes to force the shaft against the thrust bearing whereby the striker is held concentric with the diaphragm.

2. A device of the character described comprising a mounting plate, a diaphragm secured to said mounting plate, a motor provided with a continuous field piece mounted in a plane parallel to the plane of the mounting plate, means for adjusting said motor toward and away from the diaphragm, an armature carrying diaphragm agitating means, a cover cap, and connecting means for said motor including coacting contact members carried by the cover cap and field piece one of which is resilient.

3. An electrically operated horn of the character described including a mounting plate and a diaphragm supported thereby, a motor for operating said diaphragm, including a field piece, means for adjusting said motor toward and away from said diaphragm, a cover cap, a flexible U-shaped spring secured to the field piece and having electrical connection with said motor and a terminal extending through said cover-cap and having an inside engaging surface for contact with the free end of said spring, the outside portion of said terminal forming an outside connection for said motor.

4. A device of the character described comprising a mounting plate, a diaphragm secured thereto, a motor for agitating the diaphragm including an apertured field piece, and means carried by the mounting plate and passing through the apertures in the said field piece for adjustably mounting the motor with relation to the mounting plate, a cover for the motor, said adjusting means passing through the cover and means carried by the adjusting means for securing the cover in position.

5. A device of the character described, comprising a mounting plate, a diaphragm secured thereto, a motor for agitating the diaphragm including an apertured field piece, screws carried by the mounting plate and passing through the apertures in the field piece, nuts threaded upon the screws and arranged upon the opposite sides of the field piece and holding the latter in adjusted position relative to the diaphragm, said screws having reduced ends, a cover having apertures to receive the reduced ends, and nuts on the reduced ends for holding the cover in position.

6. In a device of the class described a mounting plate, a circular diaphragm secured thereto, a centrally located wear piece on the diaphragm, a motor having a frame including portions formed on the arc of a circle and a straight portion forming a chord of the same circle and mounted concentrically with the diaphragm, an armature and armature shaft mounted in said frame and provided with a centrally located striker, a disk commutator on said shaft and brush holders mounted on the straight portion of the frame within the outline of the said circle, and carrying brushes coacting with said commutator.

7. A device of the character described including a mounting plate, a diaphragm secured to said mounting plate, a pair of supporting members secured to said mounting plate, a motor held in adjusted position relative to said diaphragm by said supporting members, a frame for said motor comprising two sections, each provided with an aperture, a rotary shaft for said motor having a bearing formed in each aperture of said frame, a disk commutator supported by said shaft, spring pressed brushes supported by one section of said frame for engagement with said commutator, a centrally located striker on said shaft, and means carried by the other section of the frame for preventing longitudinal movement of said commutator relative to said brushes and for holding the striker concentric with the diaphragm.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 17th day of May, 1919.

WILLIAM KAISLING.