Aug. 31, 1954 P. NIELSEN 2,688,129

ELECTRIC HORN

Filed Aug. 1, 1952

FIG. 1

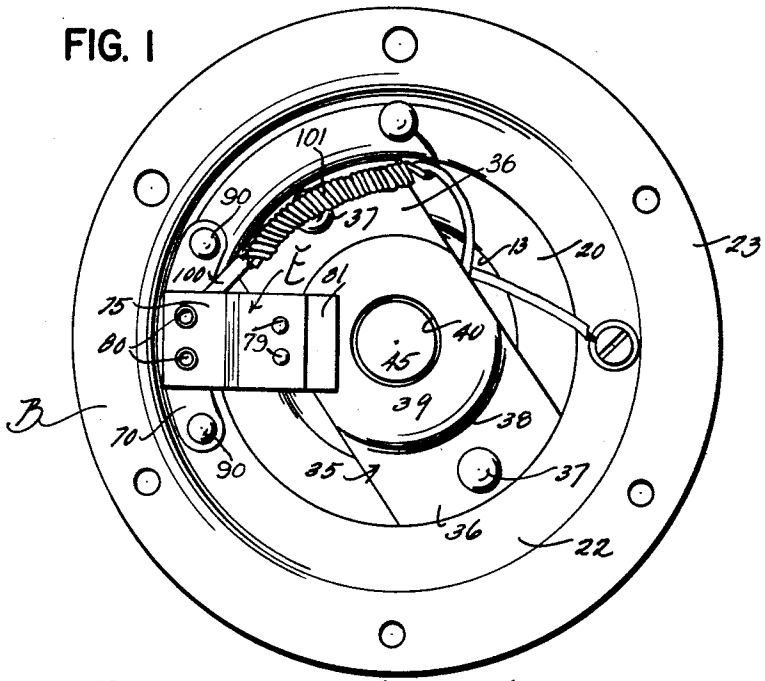


FIG. 2

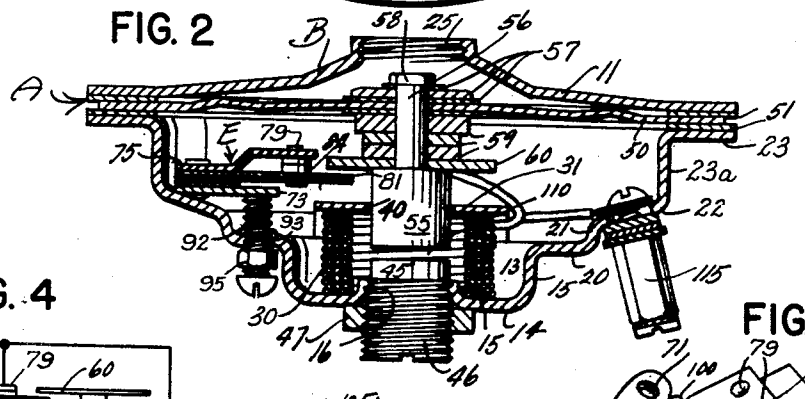


FIG. 4

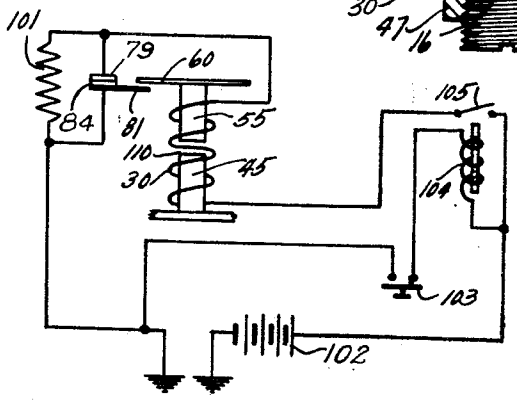
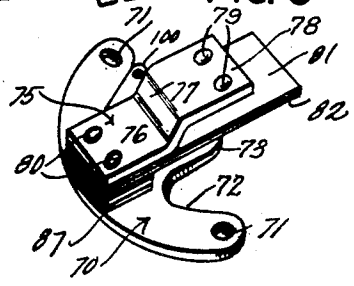


FIG. 3



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ELECTRIC HORN

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1 Claim. (Cl. 340—388)

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This invention relates to improvements in electric vibratory horns.

The primary object of this invention is the provision of an electrical horn having an improved assemblage of parts by means of which the horn may be economically and durably constructed.

A further object of this invention is the provision of an improved housing construction for electric horns of the diaphragm type, by means of which the parts may be efficiently and economically mounted.

A further object of this invention is the provision of an improved adjustable air gap construction for diaphragm type electrical horns with cooperative adjustable circuit maker and breaker means.

A further object of this invention is the provision of an improved circuit maker and breaker assemblage for diaphragm type electrical horns.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views:

Fig. 1 is a top plan view of a cup shaped base plate structure for the horn housing, showing the horn parts assembled therein.

Fig. 2 is a transverse cross sectional view taken diametrically through the horn structure, showing the associated relation of the circuit maker and breaker sub-assembly and other details.

Fig. 3 is a perspective view of the contact maker and breaker assemblage.

Fig. 4 is a wiring diagram of the horn and circuit in which the same is positioned for operation.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the letter A may generally designate the improved horn. It may include a casing or housing structure B wherein is located an electromagnetic structure C, a diaphragm and armature assembly D, and a circuit making and breaking assembly E.

The housing construction B preferably consists of a cup shaped base plate 10, preferably of stamped metal, and of single piece construction. A face plate 11 is provided and may be riveted to the base plate 10 in the usual manner.

It is one of the objects of this invention to provide an economically and durably fabricated electric horn. To that end the base plate 10

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includes a bottom well consisting of a wall 14 and annular side walls 15 defining the well chamber 13. The wall 14 centrally is provided with an inturned annular flange 15, internally screw threaded at 16, to detachably receive an adjustable core of the electromagnetic structure C, as will be subsequently described. At its upper margin, the wall 15 is provided with an outturned right-angled flange 20 which at its outer periphery is annularly upturned at 21. The upturning flange 21 has an upwardly and outwardly sloping supporting flange 22. At its outer margin the flange 22 has an upturned vertically disposed annular wall 23a, which at its top is provided with a horizontally-disposed outwardly extending face plate attaching flange 23. The face plate 11 is of inverted cup shaped construction and is centrally provided with an internally screw threaded opening 25, to which a trumpet may be attached, if so desired.

It should be noted that all of the wells, flanges and walls of the base plate 10 are integral, and that the base plate is preferably stamped of a single piece of metal.

The electromagnetic structure C preferably comprises a field coil 30, resting upon the bottom wall 14 of the housing, within the well compartment 13. It has a passageway 31 into which the centering flange 15 extends. A steel bridge reinforcing piece 35 is provided for protecting and holding the coil 30 in position. It includes attaching flanges 36, riveted at 37 to the horizontal wall or flange 20 of the housing base plate 10. Centrally the bridge piece 35 is provided with upwardly extending segmental walls 38 and the top wall 39. The latter is apertured at 40 to freely receive the armature of the diaphragm assemblage D therein.

The coil core 45 is of cylindrical shape and externally screw threaded at 46 for adjustable entrance into the screw threaded opening 16 of the casing of the housing flange 15. An adjustable core lock nut 47 is screw threaded upon the core in order to hold it in the proper air gap providing relation with respect to the armature.

The diaphragm-armature structure D preferably comprises a flexible steel diaphragm disc 50, suitably connected between the base plate and the face plate by the same rivets which attach said plates together; diaphragm gaskets 51 being interposed between the outer peripheral portions of said plates and the outer peripheral portion of the diaphragm disc, as in conventional practice. Centrally, the diaphragm disc 50 is provided with an armature 55. It consists of a

reduced vertically positioned attaching shank 56, extending through a central opening in the diaphragm disc 50. Above the disc 50 there may be provided supporting washers 57 held in position by peening over the shank 56 or providing a nut 58 thereon. Spacing washers 59 are provided upon the shank 56 below the diaphragm. A tripping plate 60 has an opening to receive the armature shank 56. It rests upon the top of the armature body, as shown in Fig. 2.

Referring to the circuit maker and breaker assemblage E, the same is fabricated as a subassembly. Generally, the same is all machine work, and therefore it is preassembled prior to its attachment in the housing base plate 10. It preferably includes a segmental shaped mounting piece 70, of rather stiff cold rolled strip steel, the ends of which are apertured at 71 to receive rivets for attachment to the base plate 10, as will be subsequently mentioned. At a concaved edge 72 the piece 70 is provided with an adjusting screw engaging tongue 73, extending radially of the segment body of the strip 70, and in the same plane therewith.

The assembly E preferably includes an upper contact support 75, of the same material as the strip 70. It includes an attaching flange 76, an upwardly sloping intermediate portion 77, and a contact supporting body 78. Upon the latter is positioned a pair of contacts 79 depending from the underside of the body piece 78. This contact support 75 is riveted at 80 to the mounting strip 70. Directly under the upper contact support is an insulation strip 81 and there beneath a lower contact supporting spring or strip 82. The latter is very resilient and supports a pair of contacts 84 complementary to the contacts 79 above described. Insulation strips 87 are disposed beneath the steel strip 82, to insulate the same from the strip 70. All of these parts are clamped in place by the rivets 60.

As before mentioned, the entire circuit maker and breaker assemblage E is prefabricated. It is then secured upon and within the base plate 10 by means of rivets 90, which secure it upon the sloping wall 22 of the base plate. Thus, the tongue 73 will have a normal inclination downwardly, sloping the same as the wall 22. An adjusting screw 92 is threaded at 93 within the wall 20 of the base plate; a lock nut 95 being provided upon the screw 92 in order to hold its adjustment. The screw 92 bears against the tongue 73 to vary the spaced position of the insulation strip 81 with respect to the trip plate 60. The mounting plate 70 is not easily flexed, since it is not of clock spring steel and it has a very strong down pressure upon the screw 92 when the parts are in the position shown in Fig. 2. Preferably there is only a very slight tendency of the strip 70 to flex under the adjusting force of the screw 92.

The lower contact strip 82 is preferably provided with a laterally extending terminal 100 to which one end of the resister coil 101 is connected.

Referring to the wiring diagram in Fig. 4, the numerals above designated have been applied to like parts in the diagram. A battery 102 is provided, and the usual horn button 103. Also, a relay 104 is actuated upon closing the button 103 to close a switch 105 and direct the current through the horn coil 30. It is to be noted that both the core 45 and the armature 55 project into the coil passageway 31.

It is to be noted that the air gap 110 may be varied, to adjust the horn tone. Also in cooperation therewith the gap between the trip plate 60 and the breaker assembly strip 81 may be adjusted.

The battery terminal assembly 115 is preferably connected upon the sloping wall 22, as shown in Fig. 2.

Various changes in the shape, size and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or scope of the claim.

I claim:

In an electric horn construction the combination of a housing structure including a cup shaped base plate and a face plate, said cup shaped base plate including a central chamber providing portion having an upturned internally screw threaded annular flange extending into the chamber of said well, an electromagnetic coil mounted within said chamber of said well having a passageway which receives the upturned flange of said well therein, a core piece adjustably threaded in said screw threaded flange, lock nut means upon said core for engagement with the base plate to hold the core in adjusted relation within the passageway of said core, said base plate having an outwardly extending horizontal flange at the top of said central chamber providing portion and therefrom having an outwardly extending upwardly sloping wall portion, a face plate, means to connect the face plate with said base plate, an armature and vibrating diaphragm assemblage mounted between said base plate and face plate including an armature and a trip plate, said armature being disposed in air gap providing relation with respect to said core and extending into the passageway of said coil, a bridge plate mounted upon the said outwardly horizontal flange of the base plate having an intermediate opening through which the armature movably projects, a unitary contact maker and breaker assemblage including a mounting plate secured within the cup shaped base plate and upon the sloping wall thereof and including a resilient contact arm positioned to be engaged by the trip plate upon vibration of the diaphragm, said mounting plate having a tongue extending towards the center of the base plate, and an adjustable screw mounted upon said horizontal flange of the base plate for engagement with said tongue whereby to vary the position of the contact arm of the breaker assemblage with respect to the trip plate.

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