

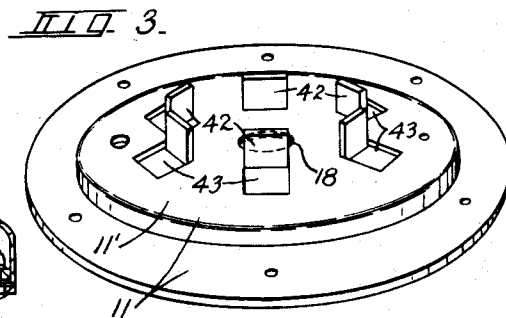
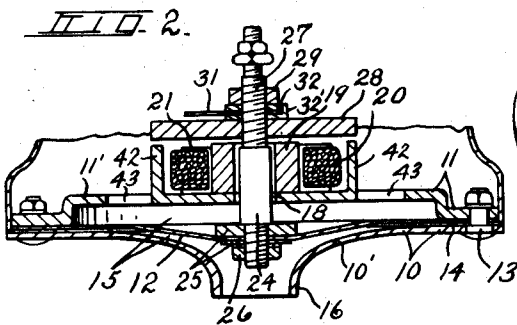
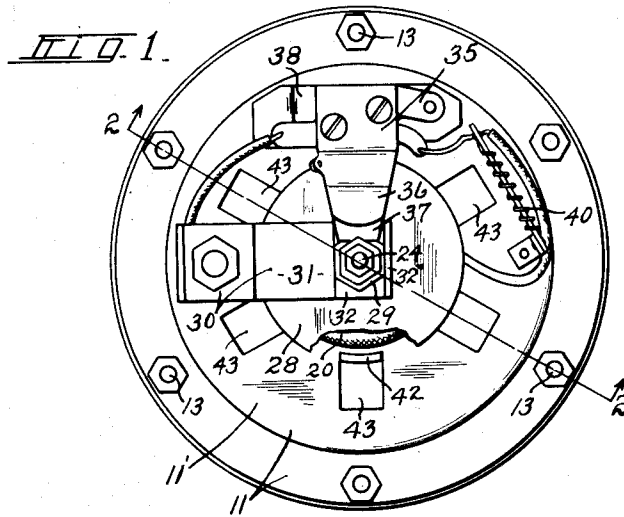
Jan. 14, 1941.

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2,228,677

WARNING SIGNAL

Filed June 11, 1938



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2,228,677

WARNING SIGNAL

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Application June 11, 1938, Serial No. 213,236

3 Claims. (Cl. 177-7)

This invention relates to improvements in a warning signal for motor vehicles. More particularly, the invention pertains to an audible signal wherein a vibratory diaphragm is actuated by an electro-magnetic motor.

The primary object of the invention is to produce a signalling apparatus of the above mentioned class which is of improved simplified construction, whereby the apparatus may be more economically manufactured without impairing or decreasing the life or the efficiency of the apparatus.

In warning signals of the electro-magnetic diaphragm type, the field coil of the electro-magnetic motor is usually mounted in a case or frame secured to one of a pair of housing sections which support the diaphragm and motor in cooperative relation with each other.

A more specific object of the invention is to utilize portions of the housing section supporting the motor, by stamping or pressing upwardly or outwardly spaced sections thereof, to form a cage integral with said housing section for the field coil of the electro-magnetic motor.

In audible signals of the electro-magnetic diaphragm type, the diaphragm housing section which is utilized to support the motor is usually provided with a plurality of apertures to form air passages extending therethrough in communication with the adjacent side of the diaphragm chamber formed by the housing sections.

A further object of the invention is to utilize the material punched from the openings formed in the housing section for the air passages in said housing section communicating with the diaphragm chamber to form the cage for the field coil of the motor.

I obtain these and other objects by mechanism illustrated in the accompanying drawing, in which:

Figure 1 is a plan view of a horn or warning signal embodying the various features of this invention, the cover being removed.

Figure 2 is a detail transverse sectional view taken substantially in the plane of the line 2-2, Figure 1, with a portion of the cover shown operatively associated with the diaphragm housing sections.

Figure 3 is a perspective view of one of the diaphragm housing sections illustrating a field coil cage formed from a portion thereof in accordance with this invention.

The signalling device, as shown more particularly in Figures 1 and 2 of the drawing, comprises two circular diaphragm case or housing

sections 10 and 11 having a diaphragm 12 clamped between them by bolts or screws 13 passing through aligning holes provided in the marginal portions of the housing sections 10 and 11 and diaphragm 12. A ring gasket 14, composed of fibre or other suitable material, may, as shown in Figure 2, be interposed between the marginal portions of the outer diaphragm housing section 10 and the diaphragm 12.

These diaphragm housing sections are, as 10 shown, composed of sheet metal plates having their central portions 10' and 11' pressed laterally in opposite directions and arranged in opposed relation to each other to form a diaphragm chamber 15 between said sections. The front 15 diaphragm housing section 10 is provided with a centrally disposed forwardly extending annular flange 16 to which may be secured, in any suitable manner, a horn proper or projector (not shown).

The rear diaphragm housing section 11 constitutes a mounting plate for an electric motor for operating the diaphragm 12. For this purpose, the housing section 11 has the central portion 11' thereof provided with an opening 18 arranged substantially centrally thereof. A hollow or an apertured core 19 is secured, as by electric welding, to the housing section 11 to extend outwardly or rearwardly from the central portion 11' in substantially coaxial relation with the opening 18. The numeral 20 indicates the usual preformed field coil which is releasably secured in position on the core 19 and to the housing section 11 by a pair of metal straps 21 which extend from across the outer or rear face of the coil inwardly or forwardly intermediate the coil and the core 19 at substantially diametrical opposite sides of the opening 18, said straps having the inner ends thereof bent laterally into engagement with the outer or rear surface of the plate 11 and secured thereto by rivets, electric welding or the like.

The diaphragm 12 is provided with a central opening in alignment with the opening 18 in the rear housing section 11 for the reception of one end of a stud 24 which is fixedly secured to said diaphragm in any suitable manner as by washers 25 and a nut 26 mounted on said end of the stud in the manner illustrated in Figure 2. The stud 24 extends rearwardly from the diaphragm through opening 18 and the interior of the core 19 and has the outer end portion thereof provided with screw-threads 27 for the reception of an armature 28 which is screw-threaded on said stud portion. The armature 28, in this in-

stance, is a cylindrical disk of greater diameter than that of the field coil 20 and is adjustably secured to the stud 24 by a lock nut 29 screw-threaded on the outer or rear end portion 27 of the stud.

The armature 28 and the outer or rear end portion of the stud 24 may be maintained, as shown, against lateral vibratory movement by a resilient support 30 carried by the housing 11 and which comprises a flat spring 31 having one end clamped to the stud 24 by the nut 29 and armature 28. Washers 32 and 32' may, as shown in Figure 2, be positioned at opposite sides of the spring 31 between said spring and the nut 29 and armature 28, respectively.

The numeral 35 designates an automatic circuit breaker or interrupter which is provided, as is usual with motors of this type, to effect intermittent energizing and de-energizing of the coil 20 in synchronism with the movement of the diaphragm away from and toward the core 19. This circuit breaker may be of any suitable construction and, as illustrated, comprises a pair of contact arms 36 and 37 mounted on a bracket 38 secured to the rear diaphragm housing section 11.

Numeral 40 designates a condenser or resistance also mounted on the housing section 11 and which is connected in the circuit for the motor so as to be shunted across the contact arms 36 and 37 in a manner and for a purpose well understood by persons familiar with this art.

The housing section 11 is provided, during the formation thereof, with stamped up portions 42 arranged about the central opening 18 in substantially concentric relation therewith to provide a cage or frame for the field coil 20. These portions 42 are substantially rectangular plate-like members cut substantially radially about the opening 18 in substantially uniform circumferential spaced relation to each other. The plate portions 42 have the inner ends thereof maintained integral with the housing portion 11' at the inner end of the openings 43 formed in the housing section when said plates are bent or pressed upwardly. The plates or projections 42 are arranged in such spaced relation to the opening 18 and to the core 19 mounted on the housing section adjacent said opening as to provide ample room for the coil 20 to be mounted within the area defined by said plates or projections. These projections may be formed, as hereinbefore stated, simultaneously with the forming of the central portion 11' of the plate and the openings 43 produced thereby form air passageways communicating with the adjacent portion of the diaphragm chamber 15 provided by the housing sections or plates 10 and 11.

The projections or stamped up portions 42 form the external metallic path for the magnetic flux of the coil 20 and are arranged with the outer ends thereof positioned in substantially the plane of the outer end of core 19 which, as illustrated in Figure 2, is preferably a short distance beyond the outer face of the coil 20.

While the form of embodiment of the present invention, as herein disclosed, constitute a preferred construction, it is understood that other forms or constructions may be adopted, all coming within the scope of the appended claims.

I claim:

1. In an electro-magnetic diaphragm type warning signal having an electro-magnetic motor 15 including an electro-magnetic field coil, a plate supporting both the diaphragm and said motor on opposite sides thereof, said plate having a hole provided therein to accommodate the connecting means between the motor and the diaphragm, the combination with the electro-magnetic motor field coil, of a plurality of separate holes punched in said plate arranged in circumferential spaced relation to each other about said first mentioned hole to provide air passages through said plate, the material punched from said separate holes remaining fastened to the plate at one edge of the holes and bent upward so as to extend about the first mentioned hole to form a cage surrounding said motor field coil and providing an external magnetic path for the magnetic flux of said field coil.

2. In a warning signal of the character described including a housing plate constructed of metal of high magnetic permeability and an electro-magnetic motor field coil mounted on said plate, the combination with said coil, of a cage comprising a plurality of prongs punched and bent from said plate to form a cage surrounding said motor and providing an external magnetic path for the magnetic flux of said coil.

3. In an electro-magnetic diaphragm type warning signal having an electro-magnetic motor including an electro-magnetic field coil, a plate supporting both the diaphragm and the electro-magnetic motor on opposite sides thereof, said plate having a hole provided therein to accommodate the connecting means between the motor and the diaphragm, the combination with the electro-magnetic motor field coil, of a plurality of projections punched and bent from said plate to form a cage surrounding said field coil and thus providing a plurality of high permeability paths for the external magnetic flux of said field coil.

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