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G. J. SEISS

1,940,150

AUTOMOBILE HORN

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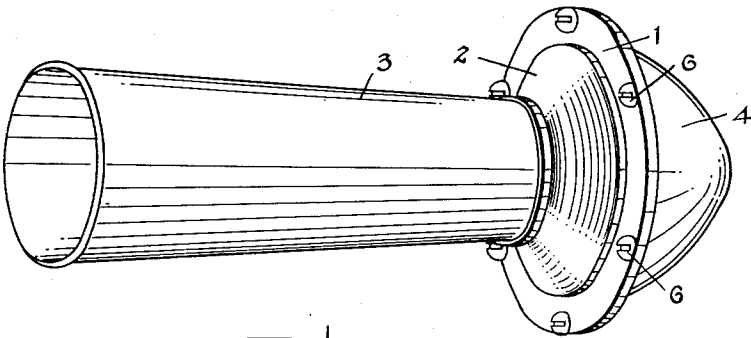


Fig 1

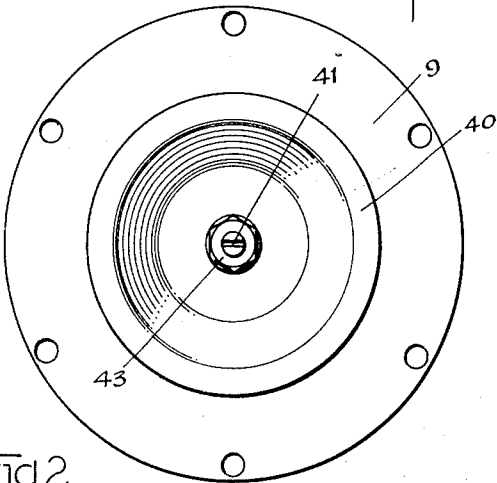


Fig 2

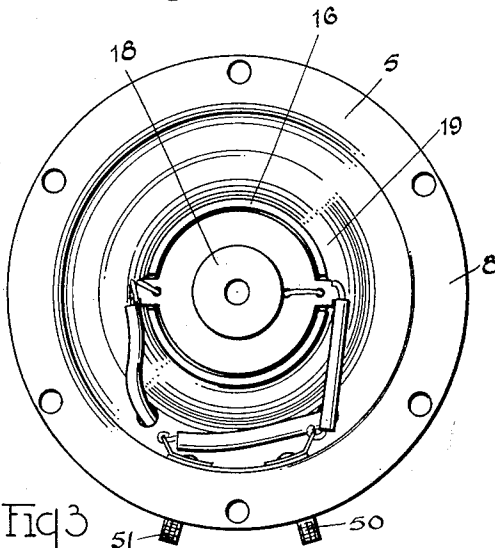


Fig 3

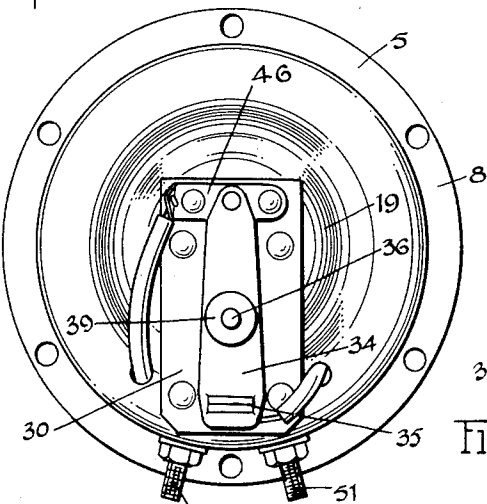


Fig 4

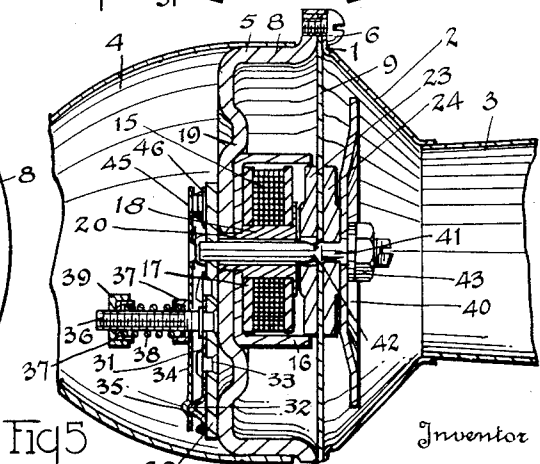


Fig 5

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UNITED STATES PATENT OFFICE

1,940,150

AUTOMOBILE HORN

George J. Seiss, Toledo, Ohio

Application January 2, 1930. Serial No. 417,914

1 Claim. (Cl. 177—7)

My invention has for its object to provide an efficient horn that is exceedingly durable and is so constructed as to produce a loud lower note. The invention also provides a construction whereby it may be readily assembled and made at a low cost of production.

The invention particularly relates to a means whereby a member having a large area is vibrated to produce the same amplitude in all its parts and which is so located with reference to the megaphone of the horn as to direct the vibratory air pressures therethrough. The invention also provides a magnet construction whereby a long stroke of the vibrating member may be produced and at the same time affords a means of considerable power for producing movements in one direction to permit relatively long forceful strokes by an elastic means in the opposite direction. The invention consists in other features which will appear from the following description and upon examination of the drawing.

The invention may be contained in horns of different forms and, to illustrate a practical application of the invention, I have selected a horn containing the invention as an example of the various structures that embody the invention, and shall describe it hereinafter. The structure selected is shown in the accompanying drawing.

Fig. 1 is a perspective view of the horn. Fig. 2 illustrates a front view of the horn with the megaphone removed. Fig. 3 illustrates a front view of the horn, the vibrating diaphragm having been removed. Fig. 4 illustrates a rear view of the horn with the cap removed. Fig. 5 illustrates a view of a section through the sound producing parts of the horn.

In the particular form of construction shown in the drawing, the horn has a shell 1 comprising a flaring or conical flange 2 of the megaphone 3 and a cover or cap 4. A supporting plate 5 is located within the shell for supporting the parts of the horn. The flange 2 of the megaphone is connected to the plate 5 by means of the screws 6, and the cover or cap 4 fits over a flange 8 that extends cylindrically from the body of the supporting plate 5. A diaphragm 9 is located intermediate the flange 2 of the megaphone 3 and a flaring portion of the flange 8 of the supporting plate 5, and is secured peripherally to the flange 8 by means of the screws 6.

A magnet 15 is supported on the supporting plate 5. It is an iron clad magnet in that it has a shell or cup 16 in which the coil 17 of the magnet is located and a central core 18 on which the coil 17 is wound. The plate 5 is provided with

a raised annular rib 19 having a diameter sufficiently large for the receipt of the shell 16 and in which the bottom of the shell 16 is socketed and which cooperates to secure the magnet in position. The core 18 has an end portion having a reduced diameter that extends through an opening formed centrally in the plate 5. The end 20 of the core is riveted over the outer surface of the supporting plate 5 to secure the coil 17 and the shell 16 in position.

The diaphragm 9 is provided with two relatively large discs 23 and 24 located centrally with respect to the diaphragm 9 and on opposite sides thereof. The discs 23 and 24 are riveted together and form the armature of the magnet 15. The diameter of the discs 23 and 24 is substantially the same as the inner diameter of the cup or shell 16, allowing, however, for sufficient clearance between the outer edge of the disc 23 and the edge of the cup 16 to prevent freezing between the disc 23 and the edge of the shell or cup 16. The supporting plate 5 is so formed as to locate the disc 23 a short distance from the end of the core 18. When the coil 17 is energized, the disc 23 is polarized by the proximity of the entire rim portion of the shell or cup 16 to the periphery of the disc 12 and the core 18 operates to draw the discs 23 and 24 with considerable force and with a relatively long stroke towards the core, that is, inwardly with respect to the cup or shell 16.

The coil 17 is alternately energized and de-energized by a vibrator that is mounted on the supporting plate 5. A plate 30 of insulating material is supported on the rear side of the supporting plate 5. A metal plate 31, having a V-shaped ridge 32, is secured by means of a rivet 33 to the plate 30. A rigid arm 34 having a V-shaped socket 35, formed in one end, is located on the raised ridge 32 for vibratory movements relative to the insulating plate 30. A screw 36 extends through an opening formed in the arm 34 and through a socket 37 that is secured to a rigid arm 34. A strong compression spring 38 surrounds the screw 36, its ends being located in the sockets 37 through which the screw 36 extends. One socket 37 is connected to the arm 34 and the other is located in a threaded socket 39. The threaded socket 39 is threaded onto the screw 36 where, by rotation of the threaded socket 39 on the screw 36, it will adjust the pressure of the spring against the rigid arm 34, the inner end of the screw being secured to the insulating plate 30.

The diaphragm 9 is provided with a large dish-shaped member 40 that substantially closes the

interior of the flared flange 2 of the megaphone 3. The member is located near the larger end of the conical flange 2. It has a diameter considerably larger than the diameter of the inner end of the megaphone. It produces vibratory air pressures in consonance with the movements of the diaphragm induced by the magnet 15. This produces within the conical space within the interior of the flaring flange 2, a large linear displacement of the air in each outward movement of the member 40 and a corresponding reduction in air pressure upon an inward movement of the member thereby producing a large amplitude of movement of a relatively large volume of air at the smaller end of the cone. The vibration of the diaphragm also operates to energize and de-energize the magnet 15 by means of the rod 41 that extends through a central hole formed in the core 18.

The rod 41 is secured to the diaphragm 9 by means of a shoulder 42 and a nut 43 which is threaded onto the end of the rod 41 to clamp and secures the member 40 in position relative to the diaphragm 9. The rod 41 extends through an opening formed in the plate 30 and so as to engage the rigid vibratory arm 34. The outer end of the arm 34 is provided with a contact 45 that is adapted to make contact with the contact 46 that is connected to the plate 30. The spring 38, whose tension is adjusted by the threaded socket member 39, operates to close the contacts 45 and 46 and yieldingly resist the opening of the contacts by the movement of the rod 41 which strikes the arm 34 in response to the energization of the electromagnet 15 produced by the closing of the contacts 45 and 46.

The disc 23 and 24 are relatively thick to give them a considerable mass and, taken with the weight of the member 14 and the rod 41, the diaphragm is heavily loaded which produces a large amplitude of movement, when vibration is estab-

lished, owing to the inertia of the large mass supported by the diaphragm. The spring 38 operates to adjust the yielding resistance to the movement of the rigid arm 34 produced by the rod 42 striking the rigid arm. The spring 38 is a heavy spring to withstand the force created by the movement of the heavy mass carried by the diaphragm 42. The arm 34 and the screw 36 is located where the pressure of the spring may be readily manipulated, that is, within the cap 4 which may be readily removed from the supporting plate 5. This produces a convenient means for adjusting the horn with respect to the magnet and also according to the note that it is desired to produce.

The supporting plate 5 is provided with a pair of binding posts 50 and 51. The binding post 50 is connected to the coil 17 and the coil 17 is connected to the fixed contact 46. The other binding post 51 is connected to the plate 31 which makes connection with the rigid vibratory arm 34 through the raised V-shaped rib 32. Thus the circuit through the magnet 15 is controlled by means of the contacts 45 and 46 that are opened and closed by the movement of the diaphragm 9 and the parts connected thereto.

I claim:

In a horn, a diaphragm, a pair of relatively heavy magnetic disks located on opposite sides of and against the diaphragm and secured centrally to the diaphragm, a shell and means for securing the diaphragm peripherally to the shell, a cylindrical cup of magnetic material extending to near the diaphragm and surrounding a portion of one of the disks, a magnetic pole connected centrally to the cylindrical cup and having one end extending axially from the bottom of the cup to near the last named disk, a coil located in the cup and surrounding the said pole.

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45	120
50	125
55	130
60	135
65	140
70	145
75	150