

Nov. 17, 1936.

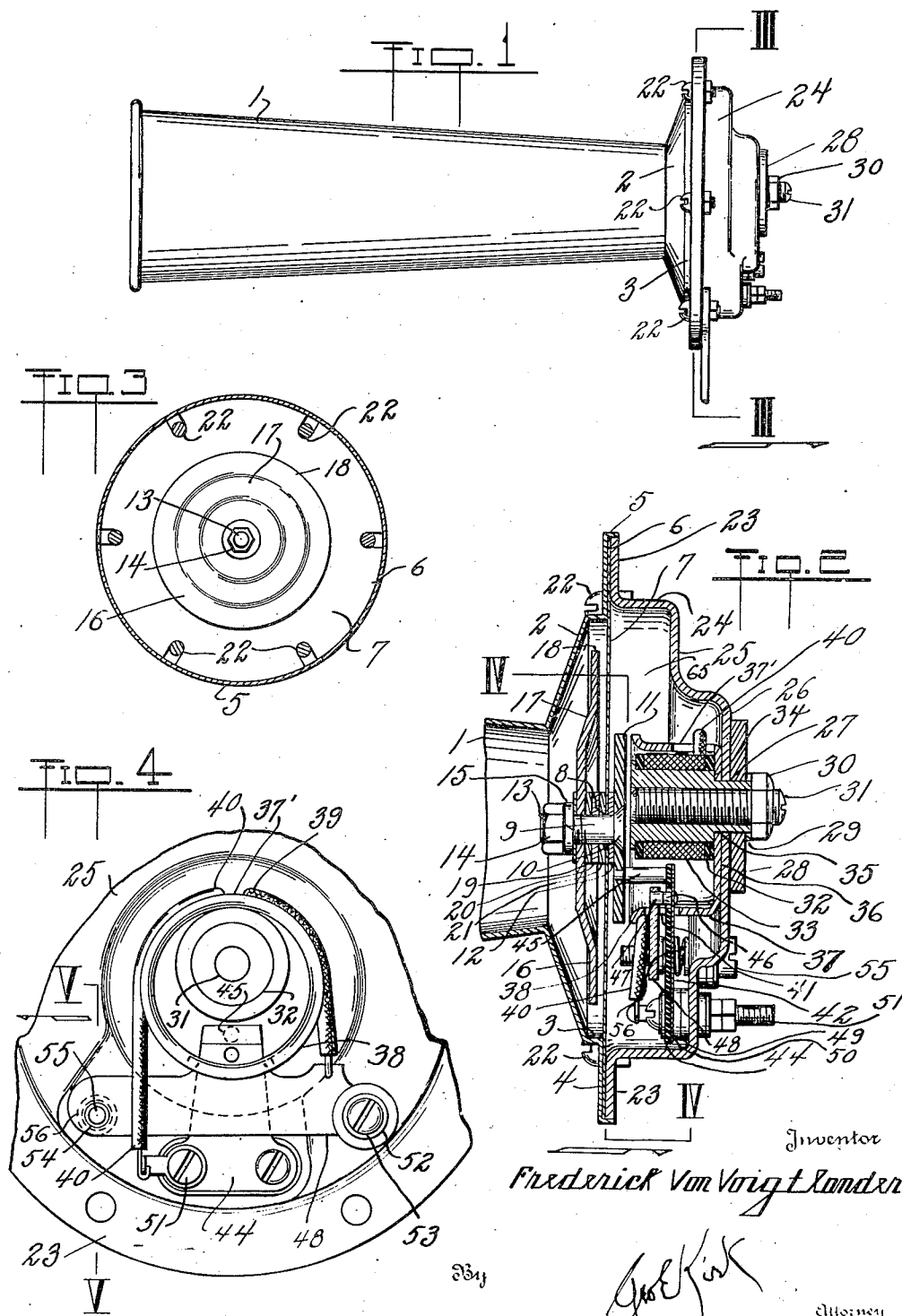
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SOUND SIGNALING

Filed May 25, 1933

2 Sheets-Sheet 1



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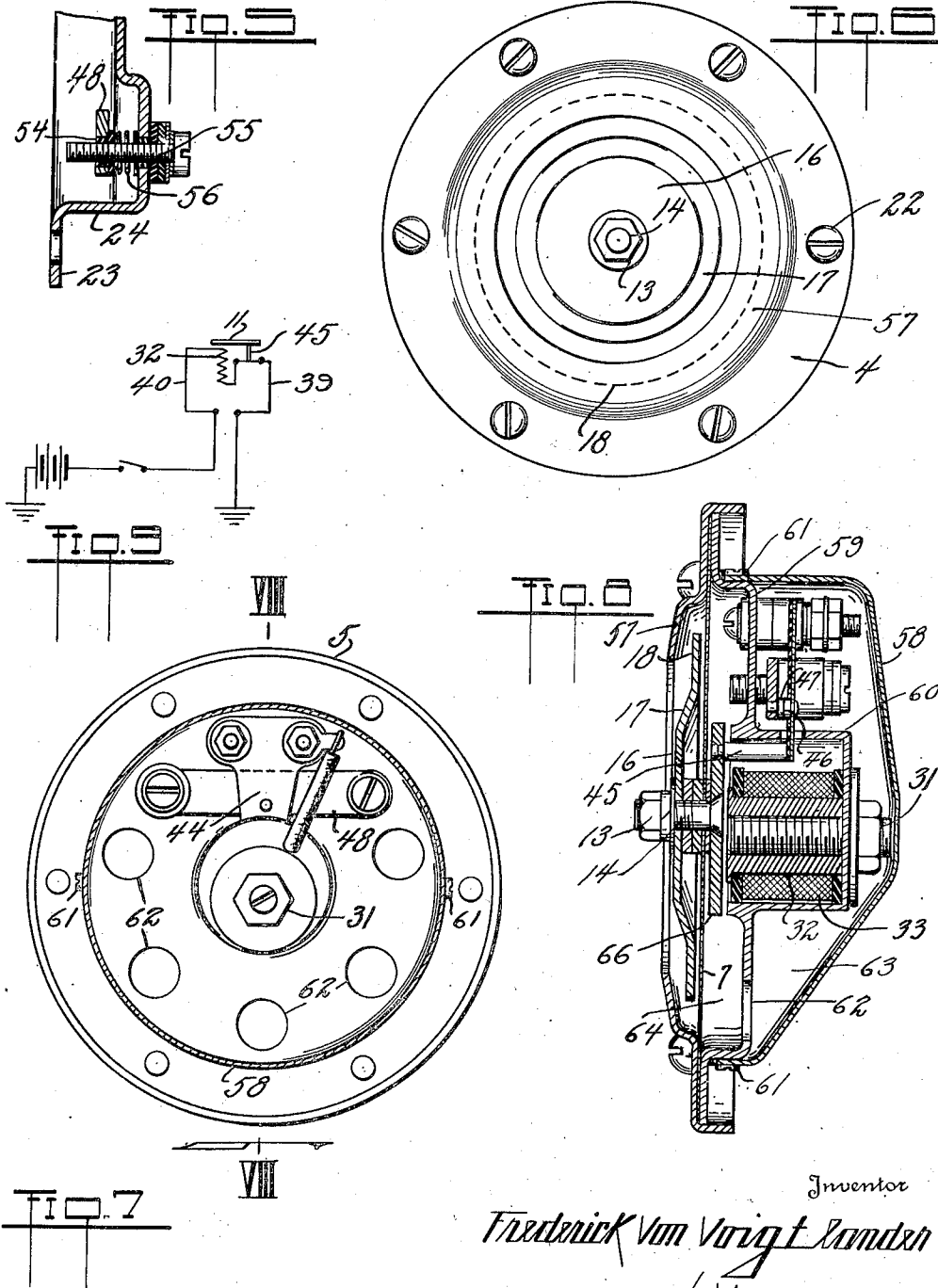
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UNITED STATES PATENT OFFICE

2,060,911

SOUND SIGNALING

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2 Claims. (Cl. 177-7)

This invention relates to diaphragm actuation.

This invention has utility when incorporated in electric sound signaling, especially in horns for motor vehicles, marine work, alarms, code signaling, etc.

Referring to the drawings:

Fig. 1 is a side elevation of an embodiment of the invention in a horn;

Fig. 2 is a section on an enlarged scale of a portion of the horn in Fig. 1;

Fig. 3 is a section on the line III—III, Fig. 1;

Fig. 4 is a view on the line IV—IV, Fig. 2;

Fig. 5 is a section on the line V—V, Fig. 4;

Fig. 6 is a front view of a trumpetless horn;

Fig. 7 is a view of the horn of Fig. 6 from the rear with the cover shown in section and with the mechanism open or ported toward the diaphragm;

Fig. 8 is a section on the line VIII—VIII, Fig. 7; and

Fig. 9 is a wiring diagram of the electric circuits for the horn disclosure herein.

Tapering projector 1 is shown with flare portion 2 having offset 3 to radial flange 4. This flange 4 terminates in outer offset 5 embracing rim 6 of diaphragm 7. This diaphragm 7 has central opening 8 through which extends bolt 9 having head 10 mounting armature 11 as spaced by washer 12 from the diaphragm 7. Remote from the head 10, this bolt 9 has threaded portion 13 mounting nut 14 which acts on spring washer 15 against loading disk or resonator 16 having cup portion 17 to rim 18, having clearance relatively to the offset 3 and located within the taper portion 2 of the projector. This resonator 16 is spaced from the diaphragm 7 by washers 19, 20, 21. The rim 18 accordingly has a desired clearance relatively to the diaphragm 7 against contacting such diaphragm.

Bolts 22 through the projector flange 4 assemble the rim 6 of the diaphragm 7 with flange 23 within the offset 5. This flange 23 is of housing having cylindrical flange portion 24 with inwardly extending portion 25 to central flat portion 26 having eccentric opening 27. About this eccentric opening 27 is disk 28 against which nests expansion washer 29 at nut 30 on threaded stem 31 as an adjustable core in spool 32, having winding 33 as a coil about this stem 31. This spool 32 has shoulder 34 through opening 35 in bottom 36 of cup having side walls 37 upwardly terminating in rim 38 adjacent the armature 11 and concentric therewith. The opening 35 in the cup bottom 36 is eccentric

of this cup bottom 36 and eccentric of the diaphragm 7, while the armature 11 and the bolt 9 are concentric of the diaphragm 7.

It is thus noted that while the cup 36, 37, is mounted eccentrically as to its mounting with the housing, its actual rim portion 38 is concentric of the armature 11, as well as the diaphragm 7. This cup side portion 37 is provided with lateral port 37' for leads 39, 40, from the coil 33. Diametrically from this port 37', the side wall 37 of the cup is provided with port 41, through which extends spring leaf 42 carrying insulation plate 44 as a mounting to be contacted by stem 45 fixed with the armature 11, eccentric of this armature 11, diametrically opposite from the eccentric position of the core 31. This stem 45, as movable with the diaphragm 7 and the armature 11 as actuated by the electro-magnet with the core 31 as well as the cup and energized by the coil 33, shifts this plate 44 away from the projector and thus moves contact 46 on the leaf 42 away from contact 47 and plate 48.

This contact 46 has its conducting circuit through the leaf 42 mounted at insulation washers 49, 50, at terminal bolt 51. The plate 48 has insulation 52 at mounting bolt 53. Insulation 54 remote therefrom is at adjusting screw 55, with which coacts expansion helical spring 56. This bolt 55 as adjusted may shift the plate 48 and thereby determine the location of the contacts 46, 47, for the action of the interrupter stem 45. It is to be noted that the lead 39 from the coil 33 extends to this plate 48, and that the lead 40 from this coil 33 extends to the terminal 51.

Instead of the trumpet type of projector 1 of Fig. 1, there may be adopted a trumpetless type of front 57 (Fig. 8). In lieu of the housing having the electro-magnet of coil, cup and core inward from its externally accessible and adjustable core 31 as shown in Fig. 2, there may be housing 58 over main frame 59 having cup 60 about the coil 33. In this instance, the interrupter 45 is within the cup, while the contacts 46, 47, are outside the cup but within the shell or housing 58 as assembled with the frame 59 by screws 61. This main frame 59 is shown with ports 62 therethrough to the diaphragm 7, thus providing added capacity chamber 63 in the shell 58 over the capacity of chamber 64 within the frame 59 toward the diaphragm 7. It is thus noted that this chamber 64 region is of less capacity than chamber 65 (Fig. 2). Armature 66

(Fig. 8) is concentric with the diaphragm 7 but eccentric of the core 31.

The amplitude of vibration for the diaphragm is increased due to the provision of the ports 62.

- 5 The back cap or shield 58 not only provides definite increase in the chamber capacity for affecting the tone of the horn but serves as a shield to protect the working parts from mechanical injury and weathering attack. By locating the
10 striker pin or interrupter 45 within the magnetic field, there is minimized tendency to distort the diaphragm in operation, especially transversely of the extent of the diaphragm. This follows because the interrupter stem 45 is located toward
15 the central portion of the armature instead of at the edge portion thereof. Spring leaf 42 accordingly has a longer leverage arm for flexing which increases the mechanical advantage for the diaphragm as the actuator thereof. Additionally, there is a better magnetic distribution
20 at the continuous rim 38 of magnetic pull on the diaphragm with relation to the opposing forces of diaphragm resistance in itself due to resilience, as well as due to air in the chamber.

25 What is claimed and it is desired to secure by Letters Patent is:

1. In a sound signal, a cupped casing, a diaphragm closing one end of the casing, a cup shaped magnetic member secured in the casing
30 with its open end extending toward the diaphragm and concentric thereof, an armature secured to the diaphragm concentrically thereof

and overlying the edge of the cup shaped member, a magnet, coil and core secured in the cup shaped member with one end adjacent the armature, the magnet unit being substantially smaller than the inside of the cup shaped member and situated near one side thereof, interrupter contacts for the coil having an operating member extending into the cup from the side opposite to that on which the coil is situated and a contact actuator secured to the armature and bearing
10 on the contact operating member at a point adjacent the side of the coil.

2. In a sound signal, a casing, a diaphragm closing an end of the casing, a magnetic member secured in the casing, extending toward the
15 diaphragm and providing rim means concentric of the diaphragm, an armature secured to the diaphragm concentrically of the diaphragm and overlying the rim means of the member, a magnet, coil and core secured in the member and
20 projecting toward the armature, the magnet, coil and core providing a magnet unit surrounded by and substantially smaller than the rim means and situated near one side thereof, interrupter contacts for the coil having an operating member
25 extending into the cup from the side opposite to that on which the coil is situated and a contact actuator secured to the armature and bearing on the contact operating member at a point adjacent the side of the coil.

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