Jan. 21, 1936. L. H. MIDDLETON 2,028,465

SOUND SIGNALING

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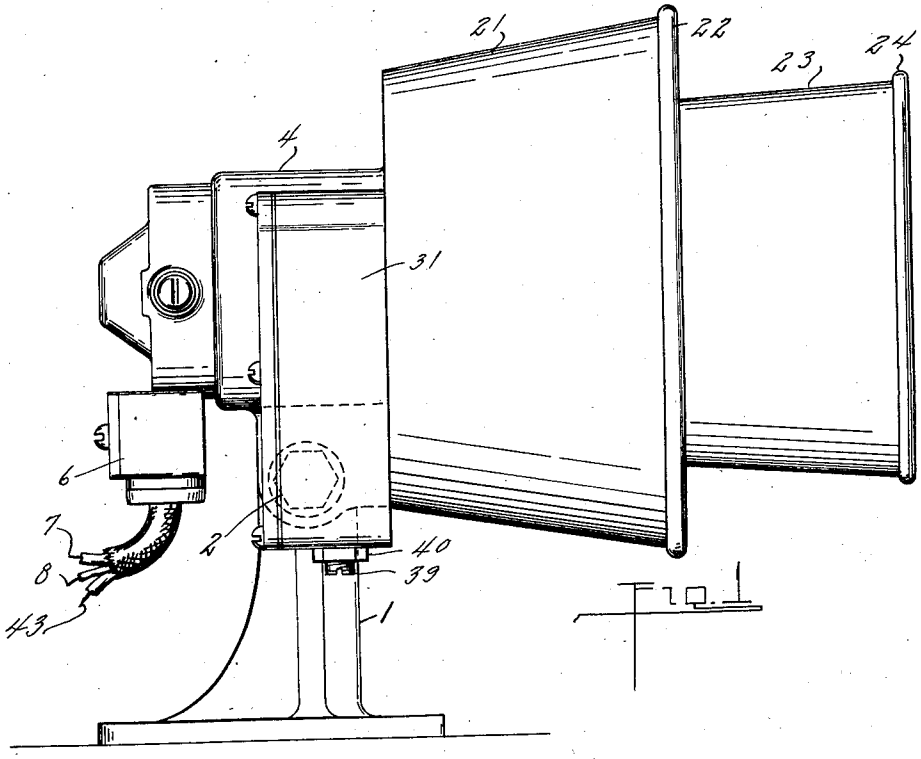


FIG. 1

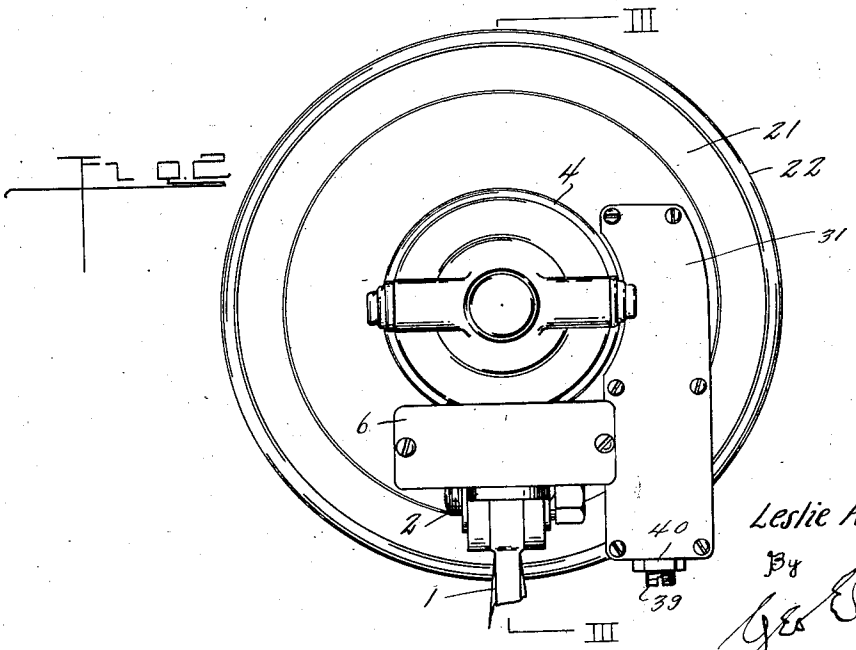


FIG. 2

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Fig. 3

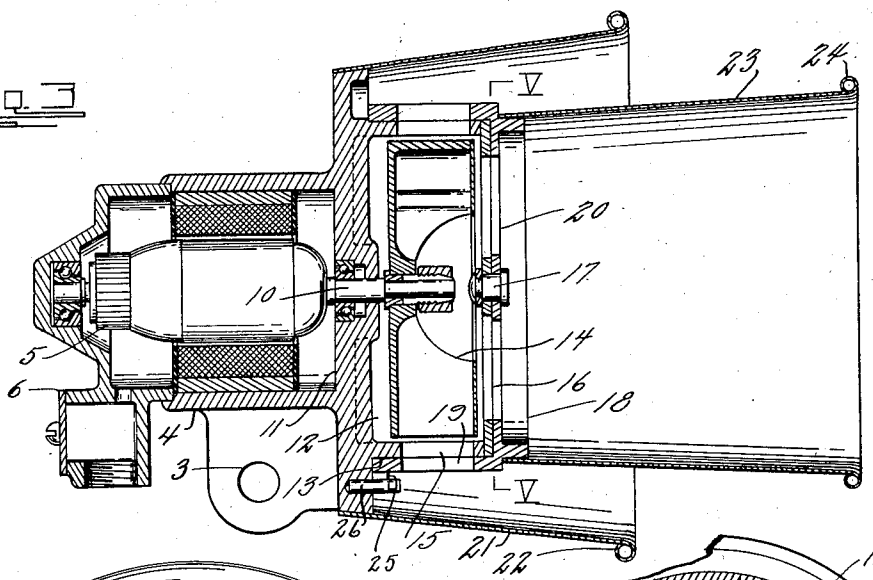
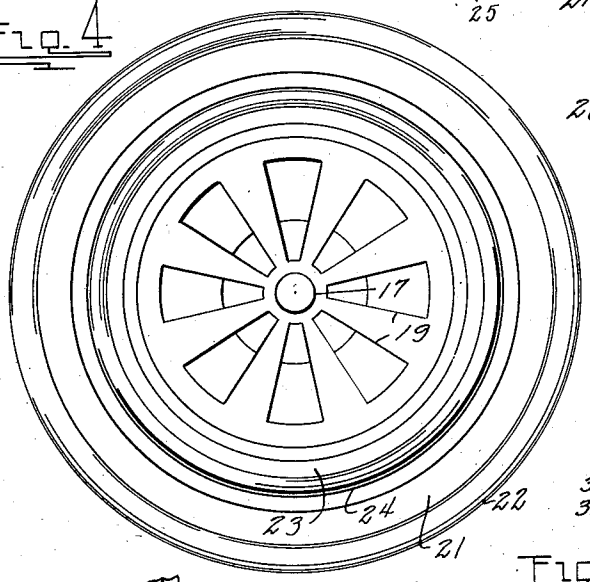


Fig. 4



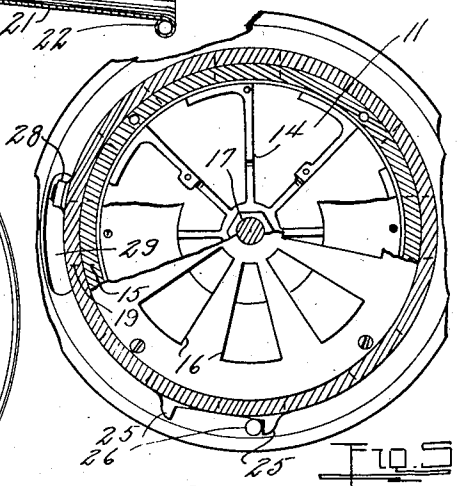


Fig. 5

Fig. 7

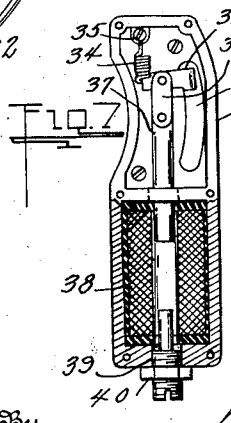
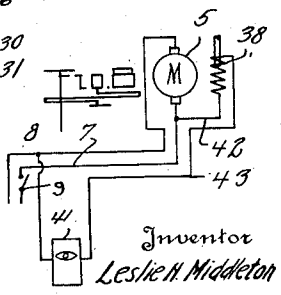


Fig. 8



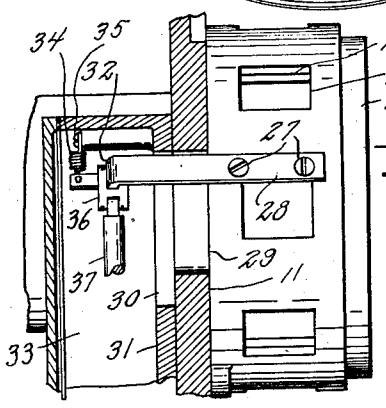


Fig. 6

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UNITED STATES PATENT OFFICE

2,028,465

SOUND SIGNALING

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Application October 11, 1930, Serial No. 488,004

3 Claims. (Cl. 177—7)

This invention relates to sound-producers especially as power operated.

This invention has utility in sirens and selective calling operations.

Referring to the drawings:

Fig. 1 is a side elevation of an embodiment of the invention in a siren, say of the selective signaling type;

Fig. 2 is a rear elevation of the device of Fig. 1;

Fig. 3 is a section on the line III—III, Fig. 2;

Fig. 4 is a view looking into the projector end of the horn from the right of Fig. 3;

Fig. 5 is a section on the line V—V, Fig. 3;

Fig. 6 is a side elevation of the air valve with operating connections partially broken away;

Fig. 7 is a view of the operating solenoid for the valve; and

Fig. 8 is a wire diagram with features of the control.

Base 1 is shown as rising to provide pivot bearing 2 for engagement with eye 3 fixed with tubular section 4 in which is mounted motor 5. From this section 4 is outlet box 6 to which electric conductors 7, 8, extend in providing power current supply to the motor 5. Switch 9 in the line 7 permits remote control of the motor 5 for starting and stopping. This motor 5 has shaft 10 protrude through diaphragm 11 into chamber 12 of housing 13. There is mounted on this shaft 10 in this chamber 12 rotary fan or impeller 14. This chamber 12 has radially through the housing 13 outlet ports 15 while axially parallel with the shaft 10 housing 13 has inlet ports 16. These ports 16 are in an annular series about central bearing 17 mounted in the housing 13 coaxial with the shaft 10. This bearing 17 mounts valve member 18 of a mushroom type having ports 19 to be shifted into and out of registry with the ports 15 simultaneously with ports 20 being shifted into and out of registry with the inlet ports 16.

In the instance herein shown wherein the ports are eight in number for each series in the housing, the space between the ports is say one- to three-quarters of a degree greater so that in the normally closed position for the valve 18, there is overlap at the ports on both sides. This renders the valve effective against whistling or singing when closed and with the impeller running. There is fixed with the housing 13 flare shell 21 terminating in bead 22 providing a passage for outflow of air from the outlet ports 15 in communication with the sound producing passage or chamber 12. The valve 18, concentric with this flare member 21, is provided with flare portion 23 terminating in bead 24.

The valve 18 is provided with integral ears 25 (Fig. 5), engaging pin 26, fixed with the diaphragm or the partition 11, as means limiting the range of oscillation for the valve 18 on the housing 13.

Fixed with the valve 18 by screws 27 (Fig. 6) is arm 28 protruding through opening 29 in the diaphragm 11 and through opening 30 in adjacent box 31 there to have offset 32 in chamber 33. This offset 32 is engaged by helical tension spring 34 extending to anchor screw 35 in the upper portion of the chamber 33. There is accordingly provided a means normally holding the valve 18 in port closing position for the series of outlet ports 15 and the series of inlet ports 16.

Also in engagement with this offset 32 of the arm 28 fixed with the valve 18, is link 36 connected to plunger 37 extending into coil 38 as a solenoid. The distance of travel of this plunger 32 as a core into this solenoid coil 38 is adjusted by set screw 39 and lock-nut 40.

Device 41 at a remote point may be a selective series of signal controls, say along the lines of devices of Patent 1,044,218, November 12, 1912. Such device 41, in its operation is primarily effective after closing of the switch 9 so that the motor 5 is first brought up to speed.

Thereafter the device 41 is effective through lines 42, 43, to act on the coil 38 and, through the action of the device 41, intermittently energizes said coil 38. Said coil 38 effects pulling of the rotary valve 18 into opening position a given number of times for say Morse code or other type of signal communication.

Inasmuch as the motor 5 is up to speed and running in the closed chamber 12 there is a minimum of resistance and the motor is actually over-running. At once the valve opens for both intake and outlet ports, the air passage is effective for air circulation load through the device which tends to pull down the speed of the motor at each of these periods of short duration. After the signal is completed or repeated a number of times and then discontinued, the motor 5 is stopped and in condition for a repetition of the desired signaling, whether or not such be the same or selected manually or automatically for a different code at a later time as may be convenient in practice.

The motor 5, due to its being up to speed at the opening of the ports by the valve 18, initiates its sound production at a high pitch which drops slightly as the load slows down the motor speed. There is accordingly at the first note a penetrating high pitch of signaling value departing from

the rising tone and rendering this apparatus of peculiar worth in remote audible signaling operations such as at air fields, in open work operations such as yards where mining or freight handling operations occur, as well as in large factories.

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

1. In a sound device a main mounting plate having a central perforation and an aperture, a minor annular flange on one side and a major annular flange forming a siren stator on the other, both being concentric with the perforation, a motor having a portion mounted in the minor flange with a shaft extending through the perforation into a chamber formed by the major flange, a siren rotor mounted on the shaft in said chamber, an annular valve member fitting over the stator member, a projection on said member extending through the aperture in the plate, a solenoid mounted on the latter, a core for the solenoid, and means connecting the latter with the projection whereby the valve member may be rotated on energization of the solenoid.

2. In a sound device a main mounting plate having a central perforation and an aperture, a minor annular flange on one side and a major annular flange forming a siren stator on the other, both being concentric with the perforation, a motor having a portion mounted in the minor flange with a shaft extending through the perforation into a chamber formed by the major flange, a siren rotor mounted on the shaft in said chamber, ported closure means for the flanged chamber, a projection from said closure means extending through the aperture in the plate, a solenoid mounted on the plate, a core for the solenoid, and means connecting the solenoid with the projection whereby the closure means may be rotated on energization of the solenoid.

3. In a sound device, a main mounting plate having a central perforation and an aperture, a first flange on one side, and a second flange on the other side, said second flange forming a siren stator, both of said flanges being concentric with the perforation, a motor having a portion mounted in the first flange and provided with a shaft extending through the perforation into a chamber formed by the second flange, a siren rotor mounted on the shaft in said chamber, ported closure means for the flange chamber, a first annular extension fixed with the closure means, extending away from the plate and remote from the motor, a second annular extension fixed with the plate and extending about the first extension, a projection from said closure means extending through the aperture of the plate, a solenoid mounted on the plate, and a core for the solenoid, and means connecting the solenoid with the projection whereby the closure means may be shifted upon energization of the solenoid.

LESLIE H. MIDDLETON.