Nov. 7, 1950 H. E. HEIGIS 2,528,515

SIREN

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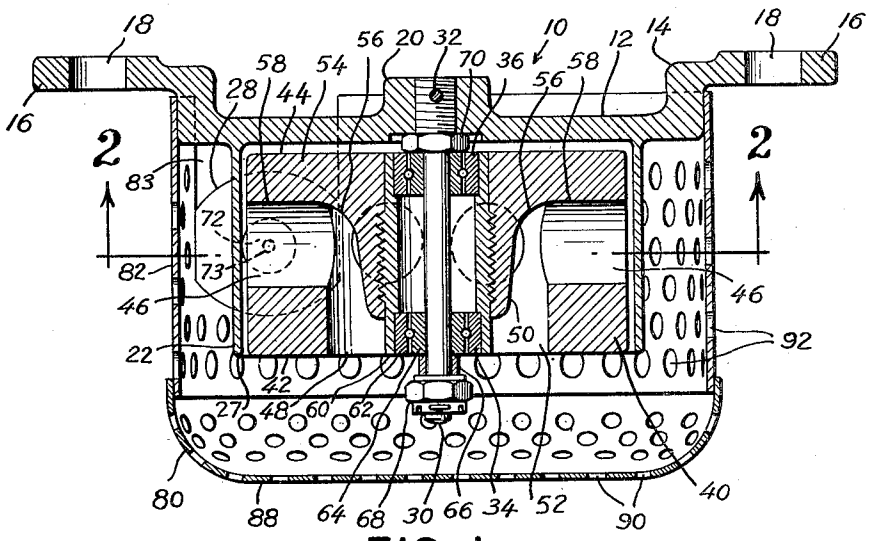


FIG. 1

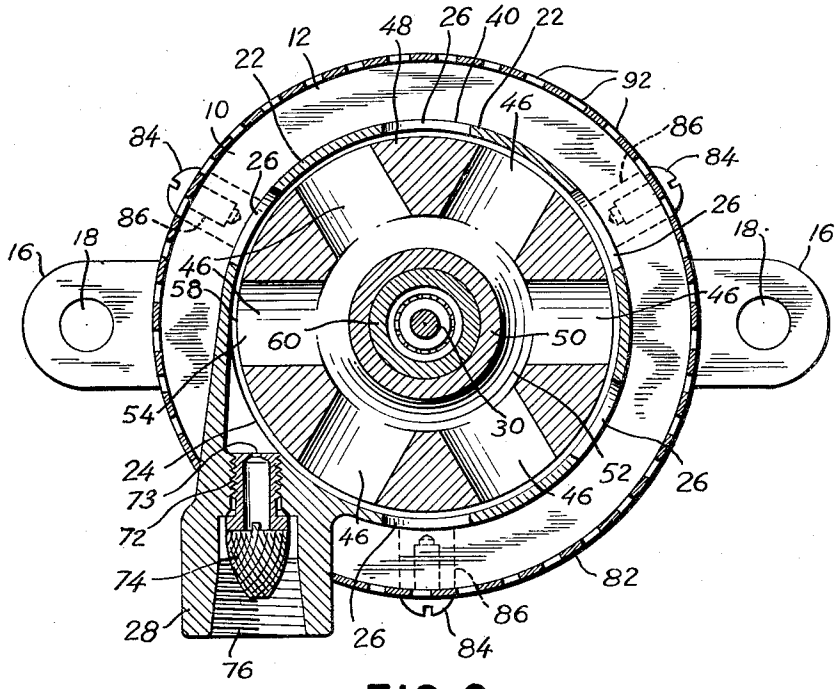


FIG. 2

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SIREN

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5 Claims. (Cl. 116—147)

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This invention relates to sirens, and particularly to sirens adapted for operation by high pressure fluid media.

The present invention is concerned with a siren for giving a signal in advance of projecting a fire extinguishing or preventing fluid, such as carbon dioxide, into a room or building.

An object of this invention is to provide a siren having a desired sound effect and of construction to operate under high fluid pressures.

Another object is to provide a novel siren operative on the turbine principle.

Another object is to provide a siren of simple and durable construction, economical manufacture and effective operation.

Another object is to provide a siren effective for handling carbon dioxide, and controlling the discharge of carbon dioxide snow therefrom.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification wherein:

Figure 1 is a longitudinal sectional view of a siren constructed in accordance with the invention.

Figure 2 is a sectional view taken along the line 2—2 on Figure 1.

Referring to the drawing, the device comprises a cast main base or support 10, including a disc-like body or rear wall portion 12 embodying perimetral portions 14 extending a short distance from the rear of the disc and having rear mounting lugs 16 projecting radially outwardly from the disc for mounting on a plane or flat floor, wall or ceiling surface, as by bolts through apertures 18 in the lugs 16.

The base 10 is further provided with a hollow boss 20 extending a less distance than the portions 14 and the lugs 16 from the rear of the disc 12 coaxially with the latter, and a front side turbine stator cylinder 22 coaxial with the boss 20 of smaller diameter than the disc 12 having a plurality of radial side-wall openings, including an opening 24 and openings 26, intermediate the front end 27 of the cylinder 22, and the rear end of the latter on the disc 12, and spaced substantially equidistant around the cylinder. A turbine jet portion 28 of the base 10, opposite the opening 24, projects substantially tangentially to the cylinder 22 outwardly therefrom.

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A spindle 30, screw threaded at one end into the boss 20 and secured thereto as by a pin 32, extends forwardly beyond the open end of the cylinder 22, and supports ball bearings 34 and 36 spaced from each other along the spindle.

A cylindrical molded hollow turbine rotor block 40, of rugged light-weight material has right-angle end surfaces 42 and 44 and substantially fills the cylinder 22, with the front end surface 42 substantially flush with the front end 27 of the cylinder 22, and the rear surface 44 slightly spaced from the disc 12. The rotor 40 is provided with radial apertures or bores 46 forming turbine vane-like surfaces and adapted for register with the stator openings 24 and 26, and has an open outer end 48, and a tubular portion 50. Each aperture 46, when in register with any of the openings 26, is adapted to produce the siren sound and, when opposite the opening 24, is adapted as a turbine blade for rotating the rotor. The portion 50 is of less diameter than an opening 52 in the end 48, and projects from a rear wall 54 of the block 40 beyond the radial block apertures 46. The outer surface of the tubular portion 50 curves, as indicated by lines 56, into rear surface portions 58 of the apertures 46 constituting front surfaces of the rear wall 54 or surfaces defining the rear wall.

A cylindrical metal liner or insert 60 is molded in position in the tubular portion 50 of the block 40, and supports outer ball races 62 of the bearings 34 and 36, inner ball races 64 of which are mounted on the spindle 30. Means, including members such as a spacer sleeve 66, a castellated nut 68 and a hexagonal nut 70, are mounted on the spindle 30 for cooperation with the inner ball races 64 to hold the rotor 40 in place.

A jet member 72 having an orifice 73, and a strainer 74 are disposed in the jet portion 28 which has an internally screw threaded portion 76 for receiving an inlet conduit from a source of fluid medium under pressure, which, in this instance, is a source of carbon dioxide.

A thin-wall perforate cover shell 80 of substantially cup-shape has a side wall member 82, through an axial slot 83 of which the jet portion 28 extends, and which nests the perimeter of the disc 12 secured thereto as by screws 84 in boss portions 86 on the rear face of the disc. An outer

or forward end portion 88 of the cover 80 has perforations 90 of substantially half the diameter and twice the number of perforations 92 in the side wall member 82, or are constituted such, in consideration of the area of the side wall member 82 occupied by the jet portion 28 and other factors, that the total open area of the end portion 88 substantially equals the total open area of the side wall member 82.

The perforations 92 are comparatively large, to facilitate the inhalation or suction of atmospheric air, and the perforations 90 are comparatively small to greatly diffuse and dampen the throw of a mixture of air and carbon dioxide snow from the siren, as will further appear.

In operation, when the pressure fluid medium is projected through the jet member 72, the stream engages the far side of the nearest aperture 46, or the top side as viewed in Figure 2, to initiate clockwise movement of the rotor 40 and move the succeeding apertures 46 opposite the jet for full turbine impulse thus starting and maintaining high speed rotation of the rotor.

When the fluid strikes the succeeding apertures 46, it not only effects the turbine vane operating action, but passes radially inwardly through the apertures or bores 46 against the curved surface represented by the lines 56, this surface thus operating as deflecting means for guiding the fluid, then containing carbon dioxide snow, axially along the rotor 40, to the bottom as indicated in Fig. 1, and out through the opening 52 in the open forward end 48 of the rotor.

The above action creates suction whereby atmospheric air is inhaled through the perforations 92 and the stator openings 26, and through the bores 46 as the latter pass the openings 26, to produce the siren sound.

The inhaled air commingles with the carbon dioxide snow, at the inner ends of the bores 46, for expulsion therewith through the rotor opening 52, and against the cover portion 88. The perforations 90 of the latter widely diffuse the snow in the expelled mixture of snow and air, and dampen or prevent expulsion of a long defined stream of snow.

The parts are all rugged, symmetrical and well balanced. They are constructed of such materials, and the passageways are all of such cross section and contour as to ensure the proper handling of the operating fluid even though the latter is carbon dioxide tending to form snow which is prevented from clogging the parts. The air is inhaled freely, and a very effective siren sound is produced irrespective of the fact that at least one of the stator openings, namely the opening 24, takes the place of one of the regular openings 26 for producing sound by the inhaled air.

Obvious modifications of the structure as described may, of course, be made, such as providing a greater number of the openings 26 and the apertures 46, placing the opening 24 between next adjacent of the openings 26 instead of taking the place of one of them, and providing an additional jet or jets.

From the above description, it is apparent that a siren has been produced, which is novel in the several particulars set forth and claimed, and is a compact effective unit of low cost for filling a long felt need, especially from its carbon dioxide operation standpoint, although operable by other fluids.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

I claim:

1. A siren comprising a stator having a cylindrical wall formed with a plurality of circumferentially spaced apertures in communication with the atmosphere, a rotor rotatably mounted in said stator having a substantially cylindrical body section formed with a plurality of circumferentially spaced substantially radially extending vane-like apertures disposed in the plane of said stator apertures and adapted to register therewith, and fluid pressure medium inlet means in said stator wall including a jet positioned in the plane of said stator and rotor apertures for directing the medium substantially tangentially between said stator and rotor and inwardly through said rotor apertures.

2. A siren according to claim 1, wherein said stator wall and said rotor body each have an adjacent closed end and an adjacent open end, the open end of said rotor body serving as a discharge outlet for the fluid pressure medium.

3. A siren according to claim 1, wherein the interior of said stator wall and the periphery of said rotor body are spaced apart to provide sufficient clearance therebetween for the flow of pressure medium, and said stator wall is formed with a recess between said jet and an adjacent stator aperture for introducing pressure medium between said stator and rotor.

4. A siren according to claim 1, wherein said stator and rotor apertures have substantially the same cross-sectional area.

5. A siren according to claim 1, wherein said rotor has one more aperture than said stator and said stator and rotor apertures are substantially equidistantly spaced whereby said stator apertures are adapted to register with a corresponding number of rotor apertures, and said jet is positioned in said stator to substantially register with the additional rotor aperture when a corresponding number of stator and rotor apertures are in registry.

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