H. HECHT.

SIREN.

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Fig. 1.

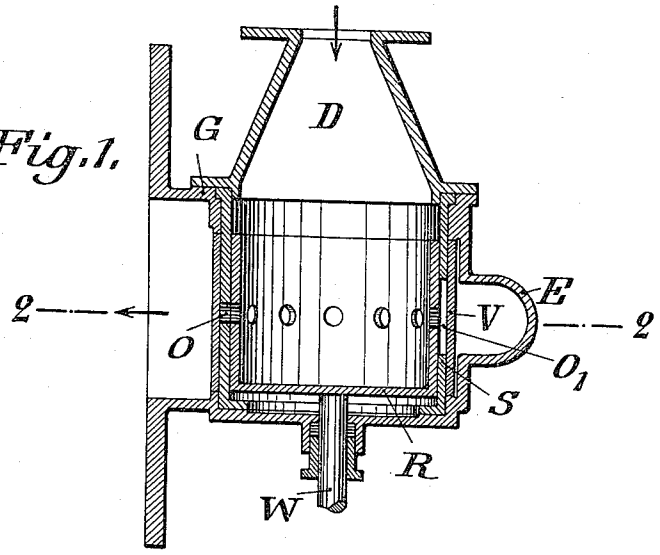
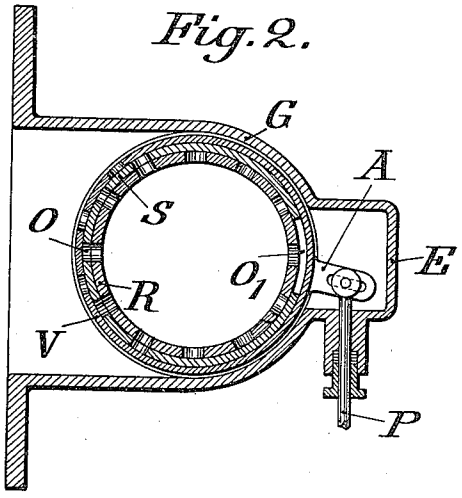


Fig. 2.



WITNESSES

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To all whom it may concern:

Be it known that I, Dr. HEINRICH HECHT, a subject of the German Emperor, residing at 62 Holtenauerstrasse, Kiel, Germany, have invented certain new and useful Improvements in Sirens; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention refers to means for submarine signaling by sound and more especially by sound produced by means of a siren.

It is known that a siren constructed substantially in the well known manner can be used to produce sound in water or any other liquid medium if, instead of operating the siren with a gaseous fluid such as steam or compressed air, it is operated by a liquid medium such as water.

For the purpose of signaling it is desirable to cut off and start the sound of the siren very abruptly and with sirens operated by a gaseous medium the usual means employed for this purpose consist in driving the rotor of the siren by a motor producing constant rotation and providing a slide valve adapted to cover and close the sound apertures of siren when shifted from one position to another. By operating the slide by hand or power signals of the Morse code type or according to any other similar code can be transmitted.

In applying this system to a siren operated with a liquid medium, such as water under pressure, a serious difficulty is encountered. It is found that to make a slide easily movable under the pressure required for satisfactory operation and at the same time to make it sufficiently watertight to obviate leakage effectually, under ordinary conditions would require very superior workmanship and that even if a satisfactory fit is produced, a slide valve of this description does not resist the wear consequent upon continuous use for any reasonable length of time. If however the least amount of leakage through the chink between the slide and the walls of the stator is admitted, it is found that by closing the slide the sound is not completely cut off but merely weakened, thus rendering the transmitted signal much less clear, or in other words, diminishing the distance over which intelligible signals can be received.

My invention consists in applying means by which the pressure of the water employed for operating the siren is itself utilized to press the slide onto its seat and thereby to produce a perfectly watertight fit irrespectively of any degree of looseness or play that may be initially given to the slide. Moreover by this means the pressure by which the slide is applied to its seat automatically varies according to the water pressure employed in every individual case and correspondingly the friction of the slide resisting its operation is regulated to suit the case, that is to say, it is diminished when the water pressure is reduced as for instance in signaling over small distances.

Sirens as heretofore constructed are usually built according to two different types namely either in the shape of a disk having apertures disposed along its periphery and journaled to rotate face to face with a similar stationary disk or else in the shape of a perforated drum adapted to rotate in a stationary cylindrical casing part of the wall of which is correspondingly perforated.

My invention more especially refers to sirens of the latter description and if so applied can preferably be reduced to practice by providing a slide in the shape of a cylinder surrounding the whole circumference of the stationary casing and furnishing openings at the back side of the casing or stator, through which the pressure in the interior of the drum acts to press the slide against its seat.

In the accompanying drawings I illustrate what I believe to be the best means for putting my invention into practice.

In the drawing Figure 1 is a longitudinal section through a drum siren arranged according to my invention and Fig. 2 is a cross section on line 2—2 of Fig. 1 with the slide in closed position.

In all figures, R is the rotor, S the stator and V the slide valve of a drum siren.

G is a casing which surrounds the stator except for about a quadrant and opposite this quadrant sound outlet holes O are arranged in the stator S.

W is a driving shaft, which may be considered coupled with an electric or other suitable motor not shown.

D is a flange adapted to receive the end of a pipe likewise not shown through which water under pressure is led to the interior of the rotor R. The preferred direction of the flow of the water during the operation of the siren is shown by the arrow in Fig. 1.

If only the apertures O were provided in the stator on the side of the outlet opening of casing G, and if it is assumed that the slide V has a certain amount of play between the casing G and the stator, the distance between the stator and the slide would be increased by the pressure of the water and the openings O could not be closed so as to be water tight.

According to the present invention an opening O_1 is arranged opposite the sound outlet holes in the stator. The water pressure then also acts through this opening on the side of the slide opposite to the sound openings and as the sleeve is closed on this side, while the pressure is relieved from the opposite side by the sound apertures, the slide is pressed against the stator at the part registering with the openings O and the greater the pressure of the water, the more effective is the closure.

This effect is the same whether the slide is moved circumferentially or axially. The circumferential displacement is shown in the present instance, because it can be illustrated more conveniently by a cross sectional view.

For the purpose of operating the slide an extension E may be provided on the rear side of the casing G and an arm A may be secured to the slide V. A slot in the end of the arm may be engaged by a pin in the head of a rod P introduced into the said extension of the casing through a water-tight packing.

By moving the rod P lengthwise the slide V is shifted from the position shown in the drawing, in which the apertures at the front side register with full portions of the stator wall between the sound openings O to a position in which the apertures in the slide register with the sound apertures in the stator.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A siren adapted to employ a liquid as the sound-producing medium, having a partition with sound orifices, a cut-off slide movable on said partition to cover and uncover the orifices, the said siren having liquid passages through which the pressure of the liquid in the siren is applied to the slide to press it toward the partition when the slide covers the orifices.

2. A siren adapted to employ a liquid as the sound-producing medium, having a rotor and a stator provided with sound orifices, a cut-off slide movable on said stator to cover and uncover the orifices therein, the said siren having a liquid passage through which the pressure of the liquid in the siren is applied to the slide to press it toward the stator when the slide covers the orifices.

3. A siren adapted to employ a liquid as the sound-producing medium, having a cylindrical rotor apertured to permit the flow of liquid therethrough, and a cylindrical stator correspondingly apertured at one side of its periphery and having a pressure aperture on the other side of its periphery, and a cylindrical cut-off slide surrounding the stator and having apertures adapted to register with the rotor and stator apertures, whereby the pressure of the liquid in the siren acts through the pressure aperture of the stator against the slide in a direction tending to press the slide against the apertures at the opposite side of the periphery of the stator.

4. A siren adapted to employ a liquid as the sound-producing medium, having a cylindrical rotor apertured to permit the flow of liquid therethrough, and a cylindrical stator correspondingly apertured on one side of its periphery and having a pressure aperture on the other side of its periphery, a cylindrical cut-off slide surrounding the stator and having apertures adapted to register with the rotor and stator apertures, and means for shifting the slide to interrupt or permit the flow of sounding liquid, whereby the pressure of the liquid in the siren acts through the pressure aperture in the slide in a direction tending to press the slide against the apertures at the opposite side of the periphery of the stator.

5. A siren adapted to employ a liquid as the sound-producing medium comprising a hollow cylinder or drum having perforations in its circumference and adapted to be rotated, in combination with a stationary cylinder surrounding the said rotor and being provided with sound apertures on one side of its circumference and a pressure aperture on the opposite side, and a third cylinder surrounding the said stator and likewise provided with apertures on one side of its circumference said apertures corresponding in size and position to the said sound apertures in the stator, said cylinder being adapted to be shifted circumferentially from a position in which its apertures register with the said sound apertures in the said stationary cylinder to a position in which the said apertures register with full portions of the stator walls, and vice versa, and means for shifting the said slide cylinder circumferentially.

In testimony whereof I affix my signature, in presence of two witnesses.

DR. HEINRICH HECHT.

Witnesses:

JULIUS LOPKE,
HANS WEGNER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."