A. C. WOODWARD.

SIREN.

APPLICATION FILED JULY 18, 1917.

1,245,299.

Patented Nov. 6, 1917.

2 SHEETS—SHEET 1.

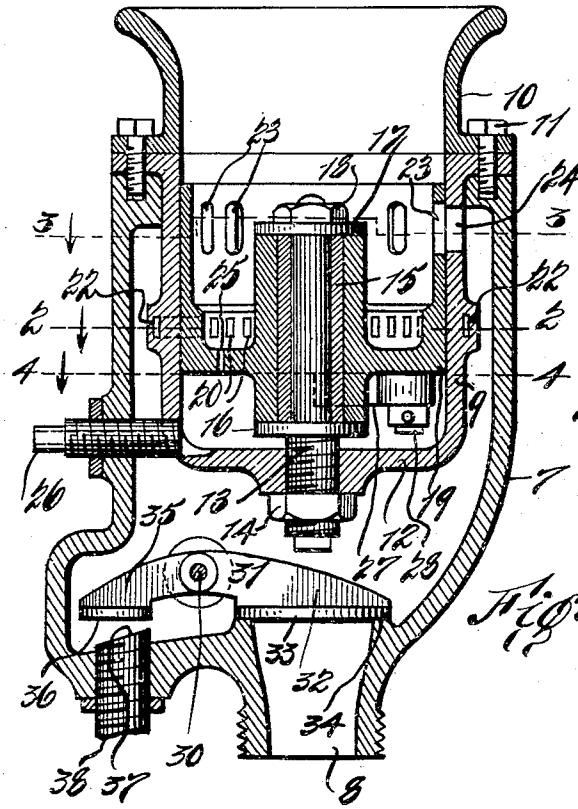


Fig. 1.

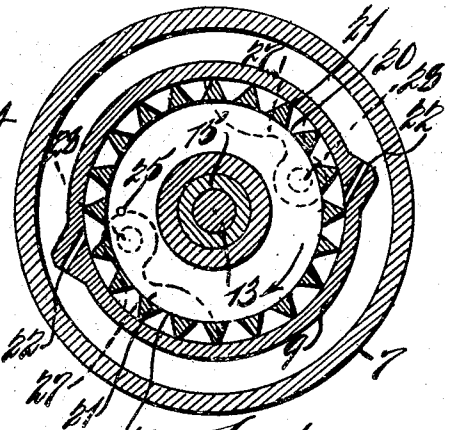


Fig. 2.

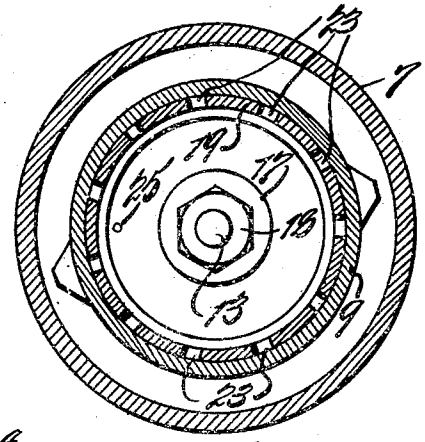


Fig. 3.

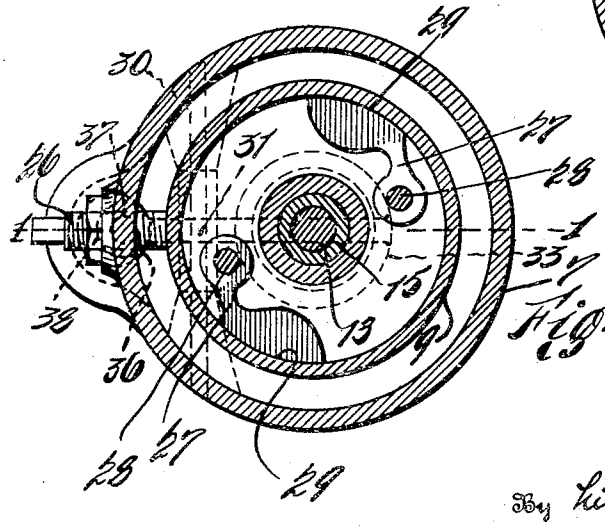


Fig. 4.

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2 SHEETS—SHEET 2.

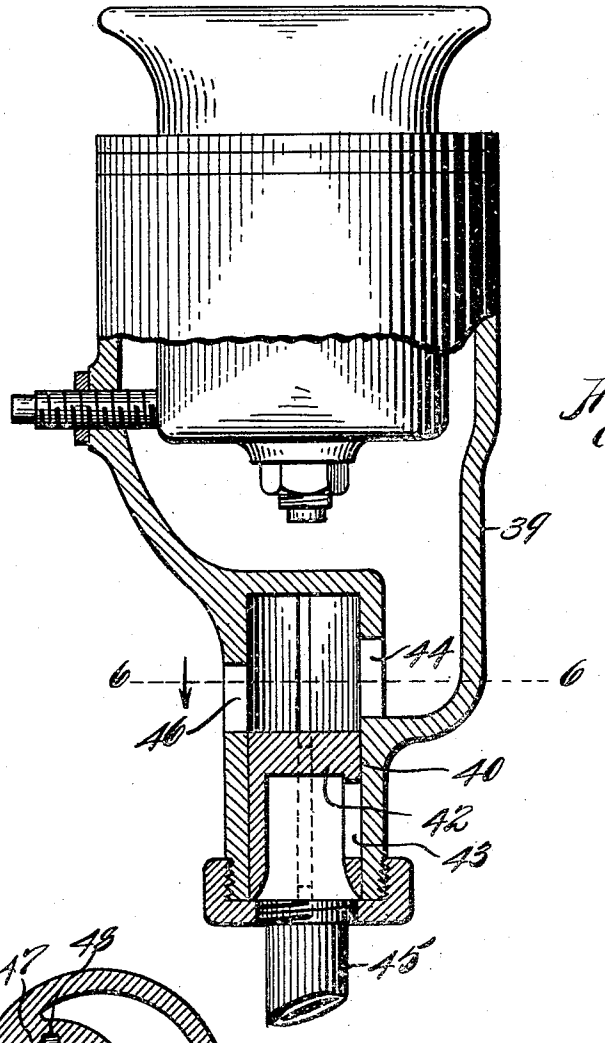


Fig. 5.

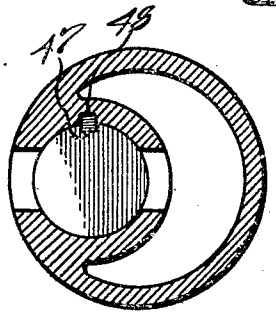


Fig. 6.

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UNITED STATES PATENT OFFICE.

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SIREN.

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To all whom it may concern:

Be it known that I, ARTHUR C. WOODWARD, a citizen of the United States, and a resident of Cranford, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sirens, of which the following is a specification, reference being made to the accompanying drawings, forming a part thereof.

My invention relates particularly to sirens for use on submarines, the siren being so constructed and operated that it may immediately be in a condition for use as soon as the siren emerges above the surface of the water. Heretofore such submarine sirens have been incapable for use until the water has been removed or blown out by the compressed air used to operate same, which requires some time and is a great disadvantage, particularly in severe winter weather, since the siren mechanism is likely to become immediately clogged by the formation of ice upon exposure to the air as the submarine rises to the surface.

The principal object of my invention is, among other things, to provide a siren construction which shall automatically and immediately drain itself upon the emerging of the submarine from below the surface of the water, and will also automatically seal itself when the siren is operated by compressed air or other gas under pressure. The novel and improved construction of my siren is illustrated in its preferred embodiments in the accompanying drawings and is particularly pointed out in the following specification and appended claims.

In the drawings, Figure 1 is a vertical sectional view taken on the line 1—1 of Fig. 4;

Fig. 2 is a sectional plan view taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional plan view taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional plan view taken on the line 4—4 of Fig. 1;

Fig. 5 is a vertical sectional view, partly in elevation of a modified form of my invention; and

Fig. 6 is a sectional plan view taken on the line 6—6 of Fig. 5.

Similar numerals refer to similar parts throughout the several figures.

Referring to the drawings, 7 indicates the outer hollow body of the siren having the passage 8 connected by a pipe to a source of compressed air, or other gas held in a suitable container under pressure, which air or gas operates the siren. Mounted on the upper rim of the outer body 7 is the depending cup-shaped casing 9, and the upwardly extending trumpet 10 secured to the body 7 by the screws 11 as shown in Fig. 1. Extending upwardly from the center of the bottom 12 of the casing 9 is bolt 13 which is screw-threaded into the bottom 12 as shown, and held rigidly in place by the nut 14. The bolt 13 carries the sleeve 15 between the lower and upper washers 16 and 17 respectively, the washer 17 being held in position on top of the sleeve 15 by the nut 18 as shown. Rotatably mounted on the sleeve 15 is the siren 19 which is cup-shaped in formation and adapted to revolve within the casing 9, the outer cylindrical surface of the siren 19 coacting closely with the inner surfaces of the casing 9 as shown in Figs. 1 and 3. The lower portion of the siren 19 is constructed with a series of slots 20, the intermediate sections 21 between the slots being tapered in opposite directions as shown in Fig. 2 so that the compressed air or gas in passing through the oppositely-disposed oblique ports 22 formed in the casing 9 may successively impinge against the sections 21 and then pass through the slots 20 thereby imparting a rapidly rotating movement to the siren 19 in the direction of the arrow shown in Fig. 2. The upper part of the siren 19 has a plurality of vertically elongated slots 23 which are adapted to produce the rapidly-succeeding sounds or tympanic shocks common in sirens as the compressed air or gas alternately passes through the port 24 and the successive slots 23 as the siren 19 is rapidly rotated. A small drainage port 25 connects the bottom of the siren 19 with the interior bottom portion of the casing 9 which in turn is connected to the atmosphere by the pipe 26.

Upon the bottom of the siren 19 I have secured two automatic governors 27 which are mounted and swing on the pivot-pins 28 affixed to the bottom of the siren 19 as shown. The governors 27 are so shaped as to have an outer circular surface 29 of the

same concentricity as the inner surface of the casing 9, as shown in Fig. 4. As the siren 19 revolves the governors 27 bear frictionally against the casing 9 through centrifugal force, thereby preventing the siren from rotating at an abnormal speed or velocity; it is obvious that the governors are self-acting and that the friction produced by their coaction with the casing 9 increases with the velocity of the siren 19.

Mounted on the cross bar 30 transversely within the lower part of the outer body 7, is the valve lever 31, the longer and heavier arm 32 having the valve 33 adapted to normally rest on the valve seat 34 formed on the top of the passage 8 as shown in Fig. 1. The shorter arm 35 carries the valve 36 adapted to coact with the port 37 formed on the top of the pipe 38 which leads to the atmosphere. The construction is such that when the valve 33 is resting on its seat 34, the valve 36 is lifted from the port 37, so that when the siren is out of operation, the interior of the body 7 is cut off from the passage 8 but is open to the atmosphere through the pipe 38.

The operation of my improved siren is substantially as follows: When the submarine rises to the surface the water that has collected in the hollow body 7, casing 9 and trumpet 10 at once drains downwardly through the slots 23 and port 24 into the hollow body 7; also through the slots 20 and ports 22, and whatever water remains in the bottom of the siren 19 passes through the port 25 and thence through the pipe 26. The water in the body 7 rapidly passes through the pipe 38 and no water can pass into the passage 8 and thence into the compressed air tanks since the valve 33 closes such passage. When the operator wishes to blow the siren, the force of the compressed air or gas at once lifts the valve 33, thereby admitting the compressed air to the body 7 to operate the siren, and simultaneously closing the valve 36 on the port 37 thereby shutting off the hollow body 7 from the atmosphere.

In the modified form shown in Figs. 5 and 6, the body 39 is so shaped as to have the passage 40 of a closed cylindrical formation within which is reciprocated the valve member 42 having the port 43 adapted to register with the port 44 when the valve 42 is in its upper position, thereby providing free communication between the compressed air pipe 45 and the interior of the body 39. Oppositely-disposed to the port 44 is the port 46 leading to the atmosphere. The lug 47 carried by the valve 42 and adapted to be reciprocated in the vertical groove 48 formed in the interior of the passage always maintains the ports 43 and 44 in proper vertical alinement. When the siren is out of operation the valve is in its lower position, as shown in Fig. 5, due to gravity, in which position the interior of the body 39 is in free communication with the atmosphere for drainage through the ports 44 and 46. When the siren is to be operated the force of the compressed air or gas at once raises the valve 42 to its upper or raised position in which the port 46 is closed and ports 43 and 44 are in register. This upper position is obviously maintained so long as the compressed air or gas passes upwardly from the pipe 45 into the interior of the body 39. In the appended claims the compressed air or gas which operates my improved mechanism is broadly designated as a "fluid".

It will be understood that the siren construction herein shown and described may be variously modified and changed without departing from the principle and scope of my invention, and it will be understood that the invention is not limited to any particular form except in so far as such limitations are set forth in the claims.

I claim as my invention:—

1. The combination with a siren construction, of means for introducing compressed fluid through the siren, means for draining the siren, and coacting means in one position closing said compressed fluid means and opening said draining means and in a second position opening said compressed fluid means and closing said draining means.

2. The combination with a siren construction, of means for introducing compressed fluid through the siren, means for draining the siren, and coacting means in one position closing said compressed fluid means and opening said draining means, and in a second position opening said compressed fluid means and closing said draining means, said means in said second position being operable by the introduction of said compressed fluid.

3. The combination with a siren construction, of means for introducing compressed fluid through the siren, means for draining the siren, and coacting means in one position closing said compressed fluid means and opening said draining means, and in a second position opening said compressed fluid means and closing said draining means, said means in said second position being operable and maintained only by the introduction of said compressed fluid.

4. The combination with a siren construction, of means for introducing compressed fluid through the siren, means for draining the siren, and means, normally closing said compressed fluid means and opening said draining means, for closing said draining means when compressed fluid is introduced into the siren.

5. The combination with a siren construction, of means for introducing compressed fluid through the siren, means for draining

the siren, and automatic means, normally closing said compressed fluid means and opening said draining means for closing said draining means when compressed fluid is introduced into the siren.

6. The combination with a siren construction, of means for introducing compressed fluid through the siren, means for draining the siren, and means, normally closing said compressed fluid means and opening said draining means, operable by said compressed fluid, for closing said draining means when compressed fluid is introduced into the siren.

7. The combination with a siren construction, of means for introducing compressed fluid through the siren, means for draining the siren, and an automatic valve member, normally closing said compressed fluid means while maintaining the draining means open, for closing said draining means when the compressed fluid means is open.

ARTHUR C. WOODWARD.

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