Sept. 8, 1931. M. KIRSCH 1,822,659

MEANS FOR EXTRACTING AIR FROM WATER

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Fig. 1.

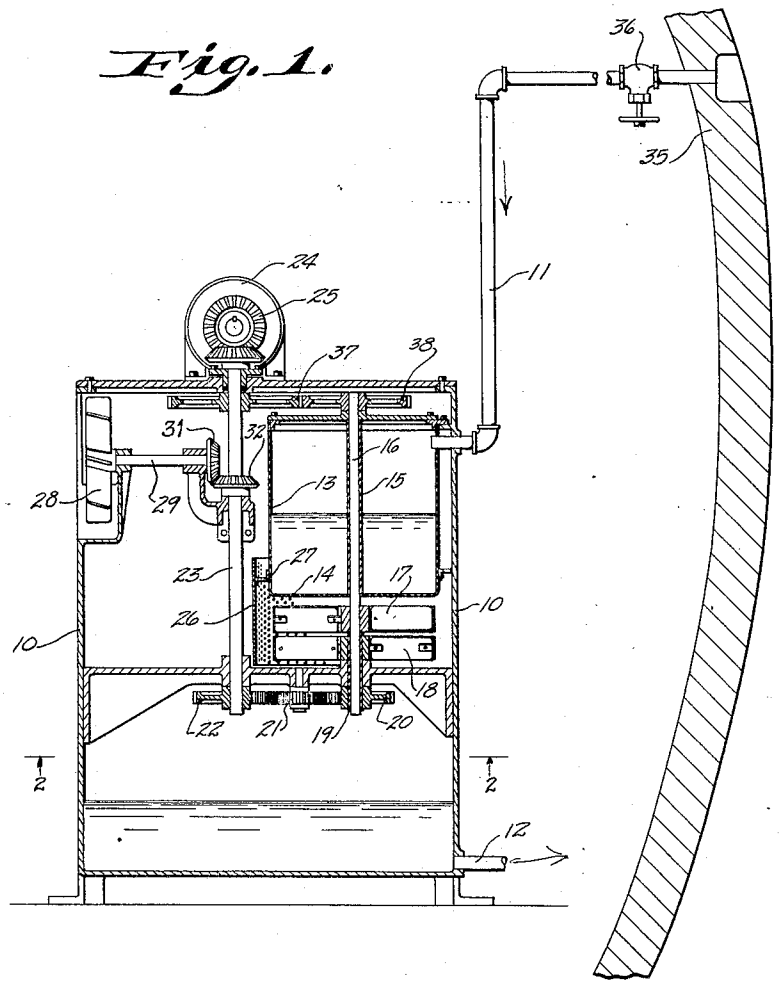
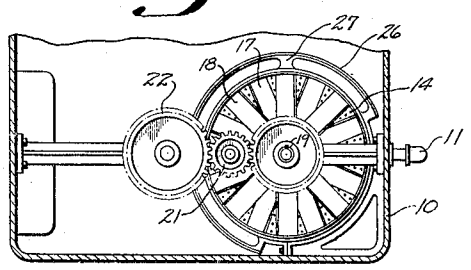


Fig. 2.



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Fig. 3.

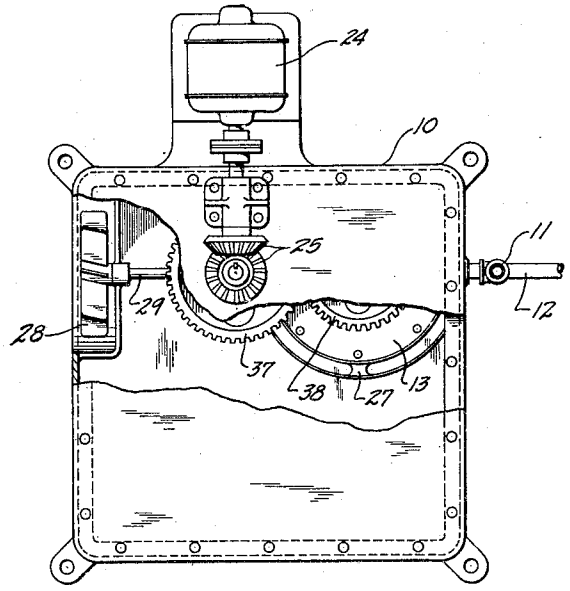
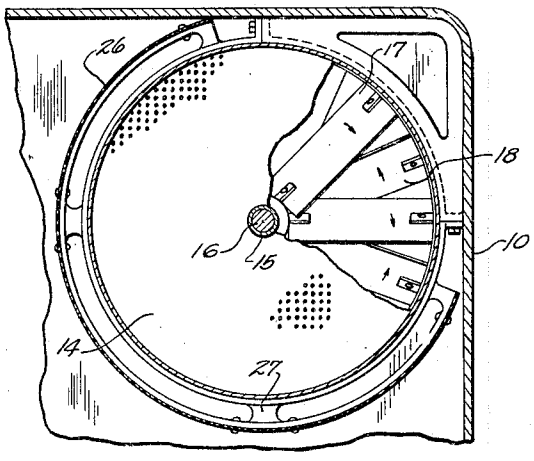


Fig. 4.



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UNITED STATES PATENT OFFICE

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MEANS FOR EXTRACTING AIR FROM WATER

Application filed July 5, 1928. Serial No. 290,317.

My invention relates to an improvement in means for extracting air from water.

The object of my invention is to provide means for renewing the supply of oxygen in submarine vessels or in any compartment where oxygen is needed and wherein the atmosphere is being vitiated of its supply of oxygen.

In the drawings:

Figure 1 is a vertical section through my air renewing device showing a fragmentary section of the wall of a submarine vessel in which my device may be utilized.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a view of the top of my device showing a portion thereof broken away to indicate the method of mounting and driving various parts.

Figure 4 is a transverse section through the dispersing tank 13, and showing a portion of the bottom of the tank 13 broken away to exhibit the oppositely rotatable fans.

Like parts are identified by the same reference characters throughout the several views.

I am aware that means for renewing the air in submarines have heretofore been provided, however, I have found that a device constructed according to the disclosure hereinafter set forth is much more efficient of operation and actually supplies more available oxygen to a compartment containing vitiated atmosphere than has heretofore been possible with any other device. In the devices heretofore provided water was admitted in the form of spray into a compartment in which a partial vacuum was maintained, and the oxygen secured from the water has been conveyed to other parts of the submarine or other vessel through the mechanism for maintaining the partial vacuum. My device is much more efficient than such devices.

Various working parts of my improved air renewing structure are contained and operated in an enclosure 10 into which water is introduced through a pipe 11 and from which water is released or pumped through a pipe 12. Within the closure 10 are provided three principal units each performing a definite function in connection with my device, in the order in which the various parts function upon water introduced through the pipe 11, these three units are as follows:

First, a container 13 comprising side walls in any desired shape and a perforated bottom 14. In the specific structure shown in Figure 1 I have shown a tubular insert 15 through which a power shaft 16 may pass for the transmission of power from above the container 13 to a point below the container where a second unit of my device is installed.

Below the perforated bottom 14 of the container 13 the second unit of my structure is constructed. This unit comprises a set of oppositely rotatable propellers or fans 17 and 18, one of these fans 17, being mounted for rotation directly upon the shaft 16 and the other 18, being mounted for opposite rotation upon a hub or sleeve 19, power being transmitted to said sleeve 19 through gears 20, 21 and 22, gear 22 in turn being mounted upon a power shaft 23 driven through bevel gears or otherwise from a motor 24 as shown at 25.

Surrounding the propellers or fans 17 and 18, I provide a perforated shield 26 which has no bottom and which is, therefore, formed in the shape of a perforated cylinder mounted upon a bracket 27 secured to the side wall 13 of the first receiving unit described above.

The third and last unit of my device a fan 28 mounted in an aperture in the wall of the compartment 10, said fan being mounted for rotation upon a shaft 29 supported by bracket 30 so as to receive power through bevel pinions 31 and 32.

This fan 28 is an evacuating fan acting upon air within the compartment 10.

As stated above my device is adapted for use in submarines and I have, therefore, shown my device mounted within the wall 35 of a submarine and I have shown that pipe 11 is so constructed as to carry water from without the submarine through a globe valve 36 into the first unit of my device within the compartment 10.

In operation my device functions as follows: Water admitted through the pipe 11 into the container 13 passes in the form of small drops downwardly through the per-

forated bottom of said container where the fans 17 and 18 revolving oppositely under the power transmitted from the motor 24 through gears 37 and 38 at the top of my device and through gears 20, 21, and 22 through shaft 16 and sleeve 19, respectively, disperse the drops of water in the form of mist. These fans swirl the drops of water outwardly ultimately against the perforated cylinder 26 through which a constant spray is induced and from which finely divided particles of water pass into the atmosphere into the main compartment 10.

The atmosphere of the main compartment 10 is maintained at a slightly reduced pressure by reason of the operation of the evacuating fan 28 with a result that all oxygen extracted or impacted from the water by the revolving parts of my device is passed into the main body of the submarine or other vessel to be made available for any purpose desired.

I have found that each of the several units of these described is invaluable for the purpose for I have found that if any of the fans or propellers 17, 18 or 28 are stopped the proper functioning of my device is seriously impaired and that whereas my entire device will replenish atmosphere in an air tight vessel to maintain life or to maintain combustion, the device will neither maintain life or combustion if any one of said units is dispensed with or disconnected from normal operation as described.

I claim:

1. In the device of the character described an apertured compartment, a fan in the aperture of said compartment for maintaining a reduced atmospheric pressure, a container within the compartment provided with an apertured wall section, oppositely rotatable fans adjacent said wall section, a shaft through the container and secured to one of said fans to provide an axis of rotation for said fan, a sleeve secured to the other said fan and rotatable about said shaft, a power shaft provided with spaced gears, and gears upon said sleeve and shaft to interact upon said power shaft, whereby to operate said fans oppositely.

2. In a device of the character described, an apertured compartment provided with a water inlet, a fan in the aperture of said compartment for maintaining a reduced atmospheric pressure therein, a container within the compartment supplied with water from the inlet and provided with an apertured wall section, oppositely rotatable fans adjacent said wall section, and a foraminous shield partially surrounding said fans.

MICHAEL KIRSCH.