May 22, 1945. E. P. GONZER 2,376,536

FLUID POWER DEVICE

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Fig. 1.

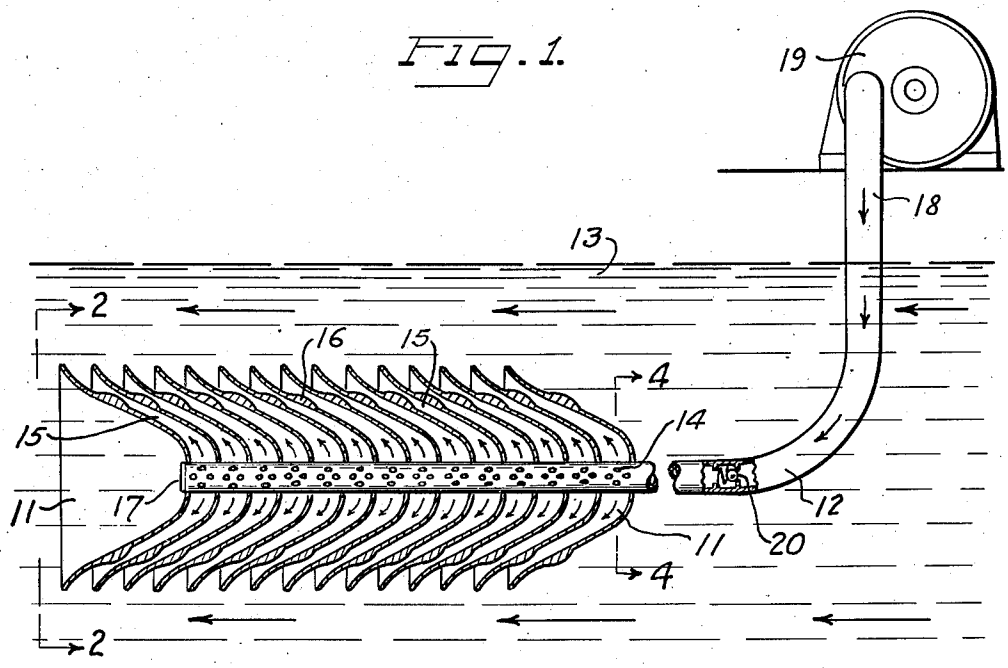


Fig. 2.

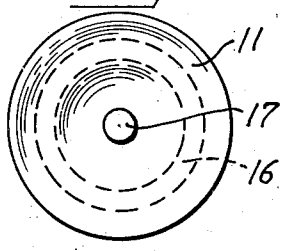


Fig. 3.

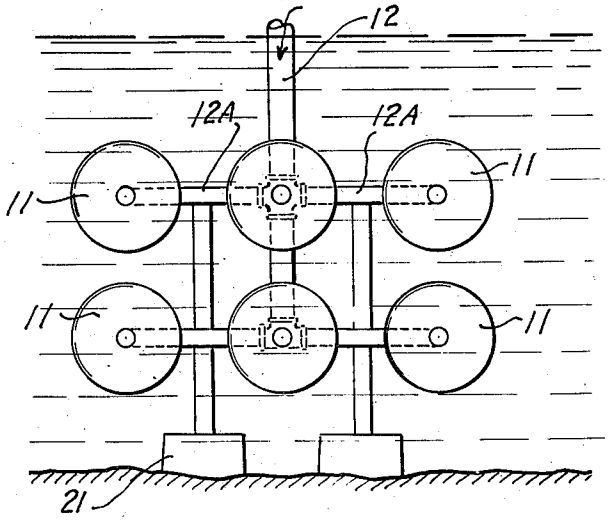
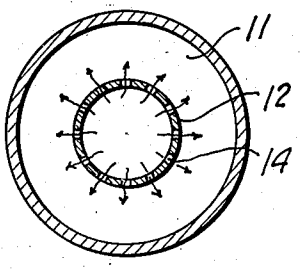


Fig. 4.



INVENTOR.
Earnest P. Gonzer

BY
Edward M. Apple

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Fig. 5.

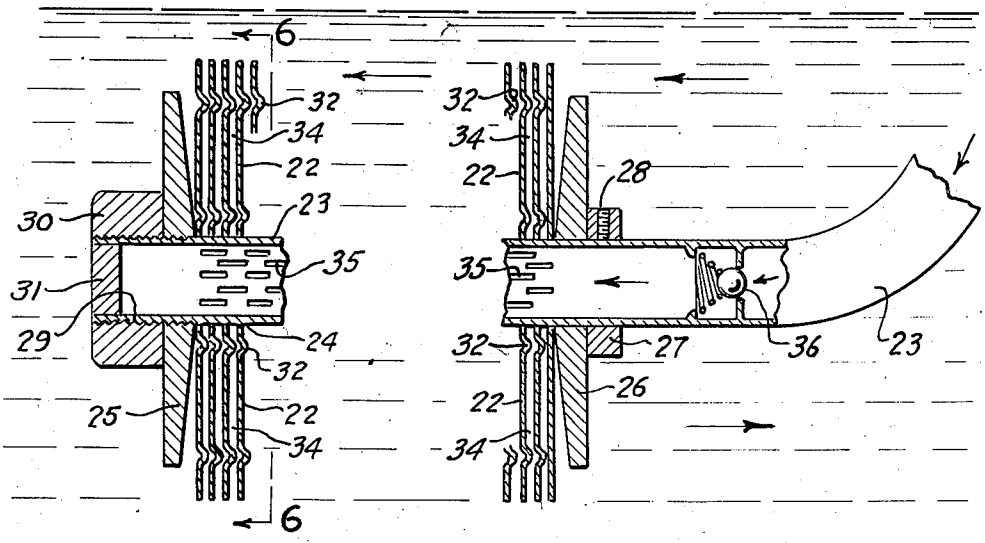


Fig. 6.

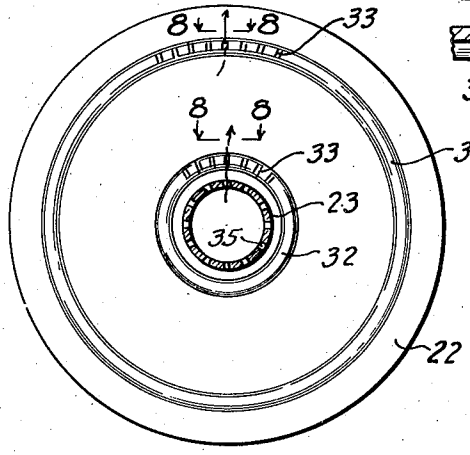


Fig. 8.

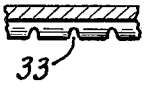


Fig. 7.

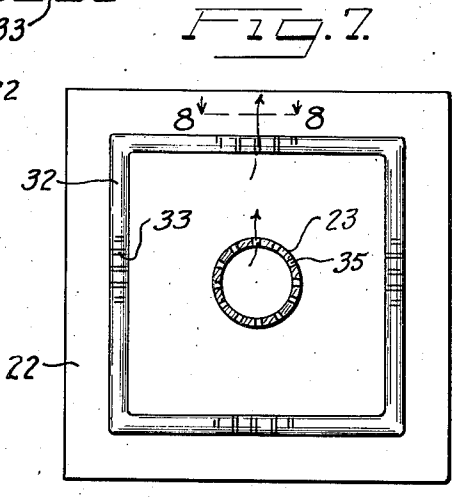
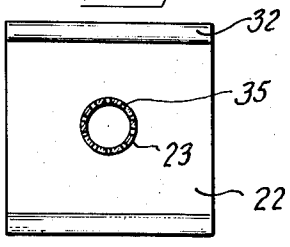


Fig. 9.



INVENTOR.
Earnest P. Gonzer
BY
Edward M. Apple

Patented May 22, 1945

2,376,536

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2,376,536

FLUID POWER DEVICE

Earnest P. Gonzer, Romulus, Mich.

Application October 4, 1943, Serial No. 504,844

5 Claims. (Cl. 230—92)

This invention relates to fluid power apparatus and has particular reference to a suction device for doing effective work.

An object of the invention is the provision of a device of the character referred to, which may be employed in a moving body of water or air, whereby the movement of the water or air about the device creates a suction in the device, which can be employed to do work at a remote place.

A stream of water having a well defined current is an ideal place for the operation of the device, although in a modified form it may be employed in the ocean so as to take advantage of wave motion, undercurrents and the like.

Because of the numerous conditions which might be found in the activating current where the device might be used, such as strength, turbulence, depth, speed and other factors that might be used to describe flow, and because of the number of forces brought into play by the device, such as vacuum, vibration, cavitation and others, it will be understood that many modifications can be made, all of which are within the contemplation of the invention. The embodiments herein disclosed are illustrative of the principles involved and are not to be considered conclusive.

The force generated by this device may be employed to operate a turbine, a pump, or other types of machines, or may be used for other useful work, wherein suction may be employed directly or may be converted to other types of energy.

In the drawings forming part of the within disclosure:

Fig. 1 is a fragmentary sectional view of a device embodying the invention.

Fig. 2 is a front elevation of the device illustrated in Fig. 2, taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a front elevation of a device employing a plurality of structures, such as illustrated in Fig. 1, tied together through a common intake conduit.

Fig. 4 is an enlarged view in section taken substantially on the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary sectional view of a modified form of a device embodying the invention.

Fig. 6 is a section taken substantially on the line 6—6 of Fig. 5.

Fig. 7 is a modified form of one of the baffles employed in a structure such as illustrated in Fig. 5.

Fig. 8 is a section taken substantially on the lines 8—8 of Figs. 6 and 7.

Fig. 9 is another modified form of a square baffle such as shown in Fig. 7.

Referring now more particularly to the drawings it will be understood that in the embodiment disclosed in Fig. 1, the device in its simplest form consists of a plurality of bell-shaped baffles 11, mounted on an intake pipe 12, and submerged in a body of water 13, in which there is a current moving in the direction indicated by the arrows. The intake pipe 12 is provided with a plurality of radial ports 14, arranged between the baffles 11, which ports 14 permit communication between the interior of the pipe 12 and the spaces 15 defined by the walls of the baffles 11. The walls of the baffles 11 are provided with increased thickness, as at 16, this restricts the area of the spaces 15, between the baffles 11, and results in a function similar in principle to that known as the Bernoulli effect. The intake pipe 12 may be closed at the lower end 17, and at the upper end 18, which is above the water level, communicates with a work producing unit 19, which may be of any character adapted to employ suction. The pipe 12 may be provided with a ball valve 20, adapted to prevent loss of suction in event of the lowering of the water level and to prevent water from entering the pipe 12 beyond its location.

In Fig. 3, I illustrate the manner of connecting together a plurality of the units shown in Fig. 1, to produce increased results. In this embodiment the units all tie unto the common intake pipe 12, through the sub-pipes 12A. The submerged assembly may be supported on the stream bed by any suitable means, as at 21. It will be understood that any number of units may be "ganged" together, and that many different installations may be made to suit the conditions encountered, without violating the spirit of the invention.

In Fig. 5, I show a modified form of a device in which I employ vertical baffles 22, which are mounted on the intake pipe 23, as hereinafter described. The baffles 22, are provided with an internal bore 24, so that they may be slipped onto the pipe 23, and secured in position by means of the stop members 25 and 26. The stop member 26 is backed up by a stop ring 27, which is provided with a set screw 28 which holds it against displacement on the pipe 23. The stop 25 is preferably internally threaded as at 29, and is held in position by a lock nut 30. The pipe 23 is preferably closed by a plug 31. The baffles 22 are preferably made of a corrosionless flexible metal or the like, and are adapted to bend one way and then the other under the influence of the water movement. This type of structure is admirably

suited for use in the ocean, where the movement of the water is reciprocable, or where there may be a current above and an undertow below.

The baffles **22** are provided with integral spacers **32**. The spacers **32** are provided with radial slots **33**, Figs. 6, 7, and 8, which communicate with the spaces **34** between the baffles **22**. The construction again simulates the action of a Venturi tube. It will be noted that in this embodiment the pipe **23** is provided with longitudinal slots **35**, which communicate the interior of the pipe **23** with the spaces **34**, between the baffles **22**. This embodiment is also provided with a spring backed ball valve **36** to prevent the loss of suction should the water level fall, and to prevent water from going beyond it into the pipe **23**.

In Figs. 6, 7, and 9, I have shown modified forms of the baffles **22**, which might be employed in a structure such as shown in Fig. 5.

The operation of the device illustrated in Fig. 5 is similar to that of the operation of the device shown in Fig. 1. The operation of the device in both embodiments is simple. In Fig. 1, the movement of the water in the direction indicated by the arrow, creates a partial vacuum in the spaces **15**, between the baffles **11** causing a suction in the pipe **12**, which draws air in from above the water level and discharges it into the water through the ports **12**, and the spaces **15** between the baffles **11**.

The operation of the device shown in Fig. 5 is substantially the same, except that in this embodiment the baffles **22** are flexible and are permitted to move in both directions with the motion of the water. This device is intended to be submerged in water having a forward and backward movement such as the surf of the ocean.

In this embodiment the spacers **32** are in contact with the surfaces of adjacent baffles **22**, and as the baffles **22** move with the motion of the water, the spacers **32** ride along the faces of the baffles, thereby helping to increase the suction in the spaces **34**, which acts, through the slots **33** in the spacers **32**, to draw air through the pipe **23**, and the slots **35** into the spaces **34** and thence discharge it into the water.

The suction created in the pipe **23** may be harnessed in any suitable manner to do effective work.

Having described my invention what I claim and desire to secure by Letters Patent is:

1. A device of the character described comprising a submerged conduit having an opening above water level, apertures in said conduit, a plurality of closely spaced, bell-like, peripheral baffles mounted on said conduit in predetermined relation to said apertures, said baffles having walls of increased thickness adjacent their free ends.

2. In a device of the character described, the combination of one or more submerged conduits having a common intake above water level, a plurality of flexible peripheral baffles secured to said conduits, spacers between said baffles, and apertures in said conduits communicating with the spaces defined between said baffles.

3. The combination defined in claim 2, in which there are passageways in said spacers in alignment with the apertures in said conduits.

4. The combination defined in claim 2, including means to limit the flexing of said baffles.

5. The combination defined in claim 2, including means to prevent the breaking of the suction in said conduits in the event of the water level falling below the upper edges of said baffles.

EARNEST P. GONZER.