

No. 736,421.

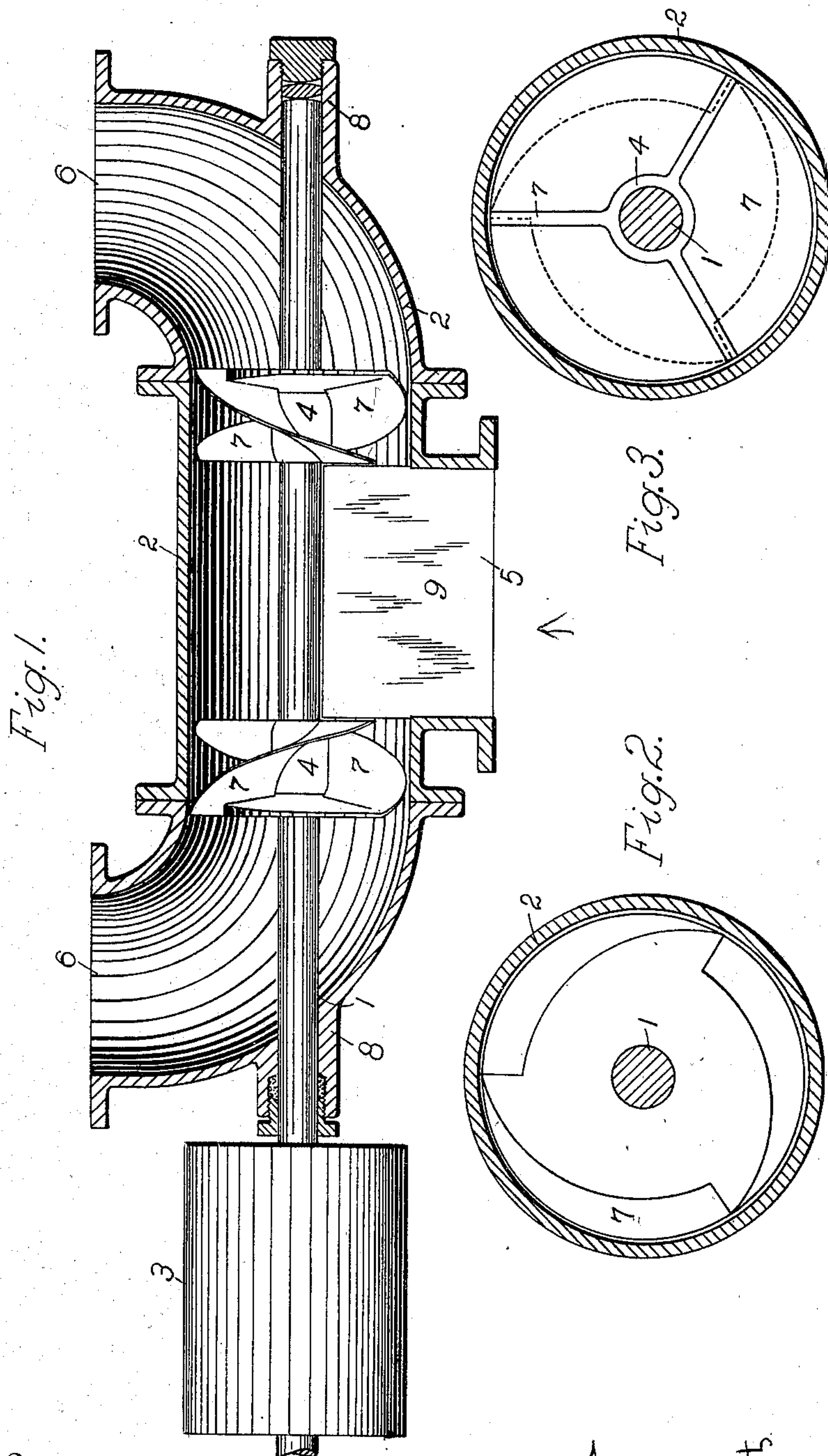
PATENTED AUG. 18, 1903.

E. T. MILES & Z. STORCH.

PUMP.

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NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD T. MILES AND ZDENY STORCH, OF ALAMEDA, CALIFORNIA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 736,421, dated August 18, 1903.

Application filed February 17, 1902. Serial No. 94,545. (No model.)

To all whom it may concern:

Be it known that we, EDWARD T. MILES, a subject of the King of Great Britain, and ZDENY STORCH, a citizen of the United States, both residing at Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Pumps; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to improvements in means for raising or moving water or other fluids.

It consists in the novel arrangements and combinations of devices, which will be hereinafter described, and pointed out in the claims.

The object of this invention is to provide a simple, cheap, and efficient device for raising or moving water or other fluids in large volumes.

In practice it has been observed that in helical-runner pumps a large proportion of the water is driven from the peripheral portion of the runner, and of this a very large percentage leaves the extreme eduction-tip. Thus with a three-bladed runner the water is thrown off therefrom in three curved wedge-shaped streams. In order to provide for this observed action of the water under the conditions referred to, a special form of runner is necessary to prevent internal circulation and cross-currents within the body of the runner. The form hereinafter described accomplishes this function and produces a very efficient pump.

Described generally, this invention consists of two or more helical runners or fluid-impellers of peculiar form within a suitable casing, with the intake located in the center of the device between the helical runners.

The object of this invention is accomplished by means of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the device. Fig. 2 is a cross-section showing an end view of runner. Fig. 3 is a cross-section showing opposite side of runner to that shown in Fig. 2.

Referring to the accompanying drawings, 1 is a rotatable shaft journaled in and longi-

tudinally of a suitable inclosing casing 2 and provided exteriorly to the casing with any ordinary driving mechanism, shown in the present instance as a belt-pulley 3, to be driven from any suitable source of power. Secured upon the shaft 1 are two or more runners or fluid-impelling devices 4. The runners or fluid-impellers are preferably made with a right and left hand pitch, respectively, the two opposing runners being set on the shaft at some distance apart. The intake 5 is located intermediate of the opposing runners 4, and the discharge ends 6 are located on the opposite ends of the casing 2.

The intake portion of the blades 7 of the runners 4 are preferably made with a graduated pitch, increasing from the intake to the discharge at about the ratio of seventeen to twenty-five.

When two or more runners are used on each side of the intake, the pitch of the second runner will commence with the pitch on the discharge side of the first runner and increase at about the same proportion as the first runner, and the pitch of the other runners will be in a like proportion. The eduction side of each runner-blade is continued till it joins its succeeding neighboring blade and without pitch. The peripheral part of this portion of the blade is formed with a suitable curve eccentric to the casing, forming therewith a curved wedge-shaped opening, as shown in Fig. 2, the base of the wedge being adjacent to the eduction side of the helical part of the runner, as shown in the various views.

Suitable bearings 8 may support the shaft 1 and provide for the exit of the shaft through the casing 2.

Antirotation-plates 9 may be provided, suitably located to prevent the wasteful internal circulation of the fluid.

Under circumstances where volume is required or when solid matter is mixed with the water, as when used as a dredger-pump, one runner on each side of the suction will be most effective and economical; but when pumping against a high head or against excessive resistance we prefer to employ a larger number of runners.

The employment of the reverse runner is

to balance the thrust, which cannot be disturbed, as in ordinary rotary pumps, by the intrusion of air through the stuffing-box 8.

The intake may be provided with one or
5 more openings, and when two openings are provided they may be connected together to form a single suction-pipe.

Where it is desirable, the discharge ends of the casing may be joined together to provide
10 for the unification of the separate streams emerging therefrom into a more convenient form of a single discharge.

It is obvious that many changes will suggest themselves to mechanics to adapt this
15 invention to the various conditions of use. We therefore do not desire to confine ourselves to the exact form, proportion, or arrangements of parts herein shown and described.

20 What we claim as new, and desire to secure by Letters Patent, is—

1. A pump-runner comprising helical blades on the induction side having a non-helical portion on the eduction side, said non-helical
25 portion having its periphery between the blades eccentric to the path of the periphery of the helical portion, forming a curved wedge-shaped discharge-opening between the blades.

30 2. A pump-runner comprising helical blades of graduated pitch on the induction side having a non-helical portion on the eduction side, said non-helical portion having its periphery between the blades eccentric to the path of
35 the periphery of the helical portion, forming a curved wedge-shaped discharge-opening between the blades.

3. A pump consisting of a casing, a runner therein secured upon a rotatable shaft, the
40 runner comprising helical blades on the induction side having a non-helical portion on the eduction side, said non-helical portion having its periphery between the blades eccentric to the path of the periphery of the heli-
45 cal portion, forming a curved wedge-shaped discharge-opening between the blades.

4. A pump consisting of a casing, a runner therein secured upon a rotatable shaft, the

runner comprising helical blades of graduated pitch on the induction side having a non-
50 helical portion on the eduction side, said non-helical portion having its periphery between the blades eccentric to the path of the periphery of the helical portion, forming a curved wedge-shaped discharge-opening between the
55 blades.

5. A pump consisting of a casing, a runner therein secured upon a rotatable shaft with a substantially similar reversely-formed runner, the runners comprising helical blades on
60 the induction side having a non-helical portion on the eduction side, said non-helical portion having its periphery between the blades eccentric to the path of the periphery of the helical portion, forming a curved wedge-
65 shaped discharge-opening between the blades.

6. A pump consisting of a casing, a runner therein secured upon a rotatable shaft with a substantially similar reversely-formed runner, the runners comprising helical blades of
70 graduated pitch on the induction side having a non-helical portion on the eduction side, said non-helical portion having its periphery between the blades eccentric to the path of the periphery of the helical portion, forming
75 a curved wedge-shaped discharge-opening between the blades.

7. A pump consisting of a casing, a runner therein secured upon a rotatable shaft with a substantially similar reversely-formed run-
80 ner, the runners comprising helical blades of graduated pitch on the induction side having a non-helical portion on the eduction side, said non-helical portion having its periphery between the blades eccentric to the path of
85 the periphery of the helical portion, forming a curved wedge-shaped discharge-opening between the blades, said casing provided with a supply-opening located intermediate of the helical runners.

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