

No. 671,090.

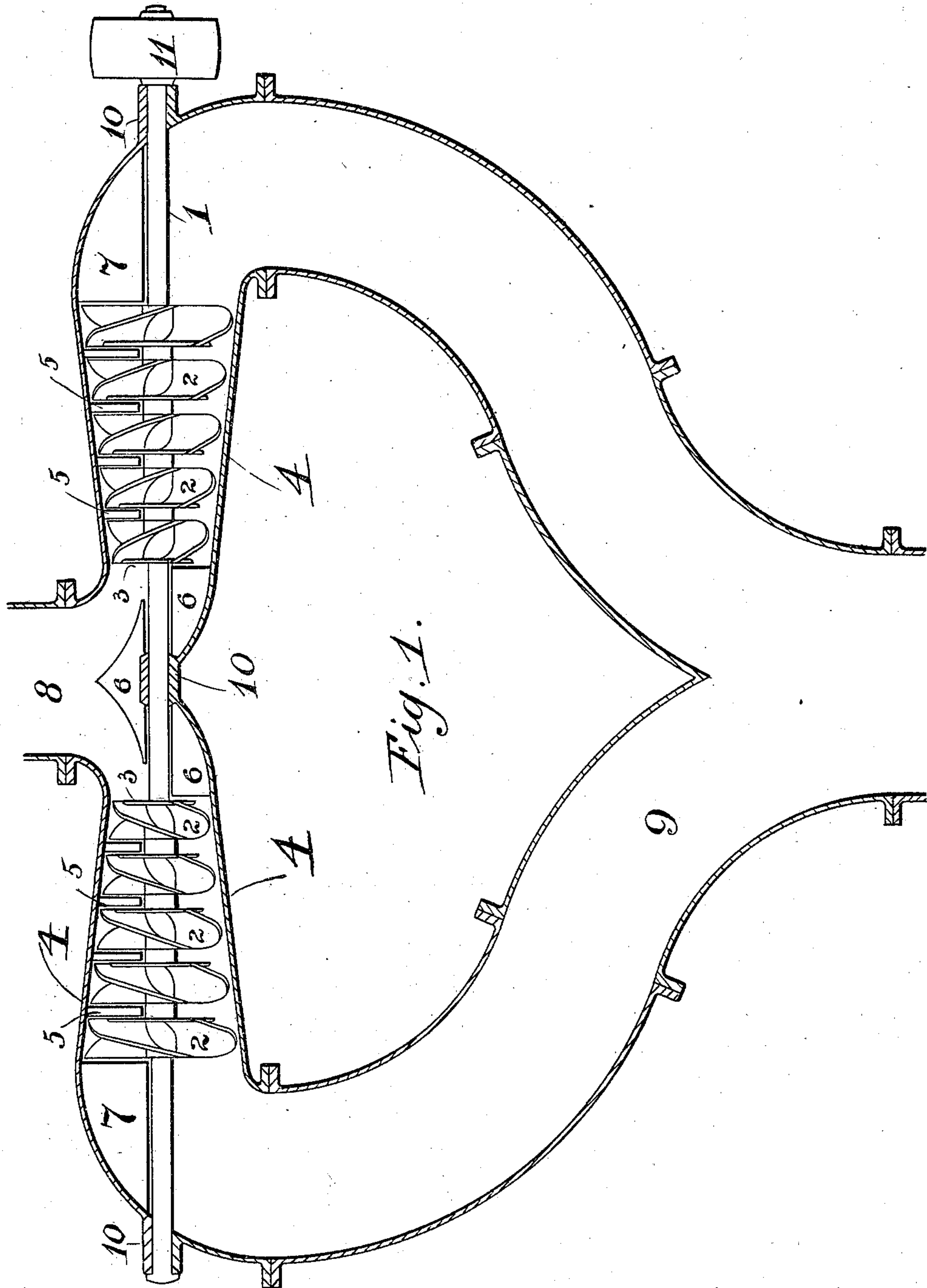
Patented Apr. 2, 1901.

J. S. MORTON.
PUMP.

(Application filed Apr. 9, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

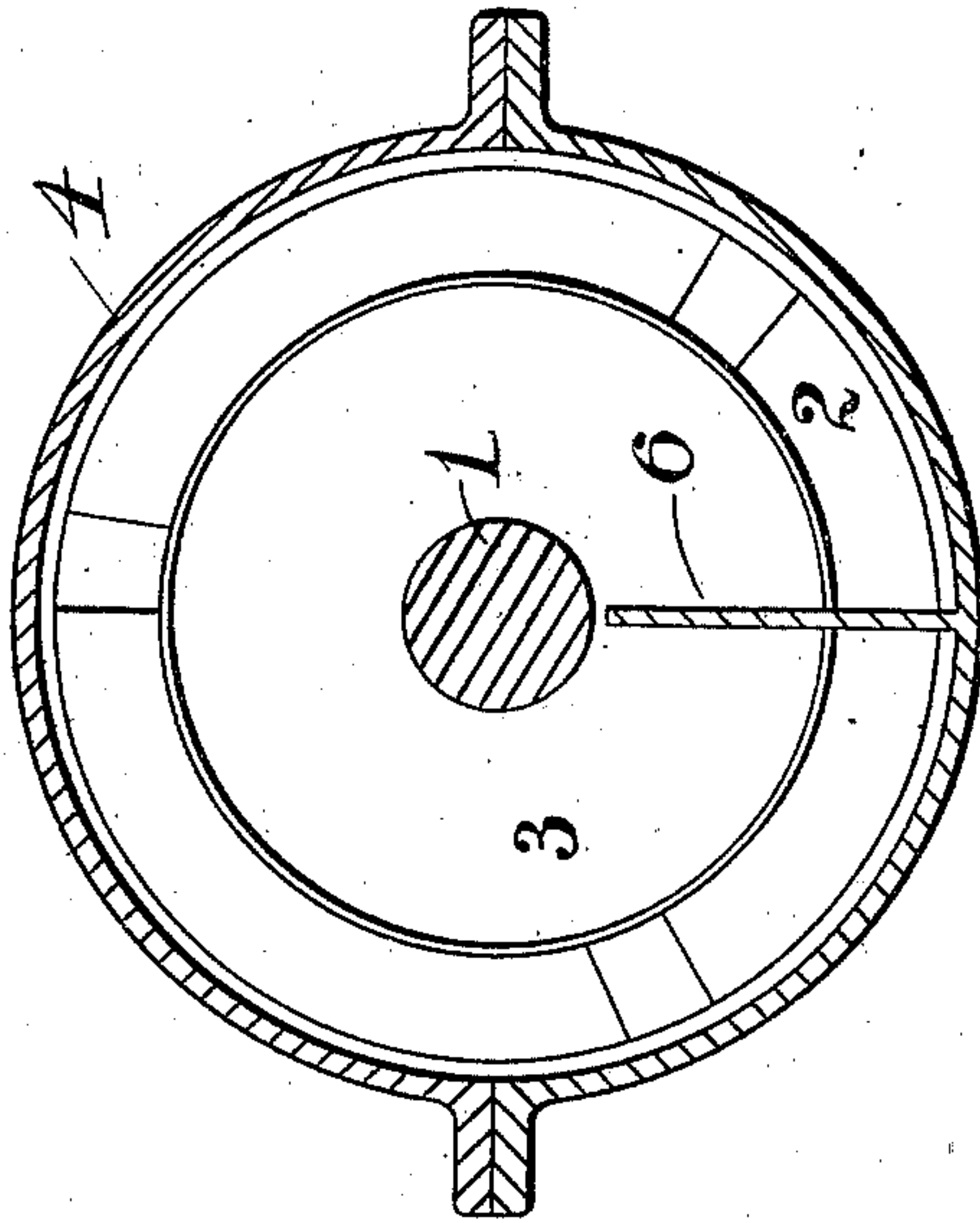
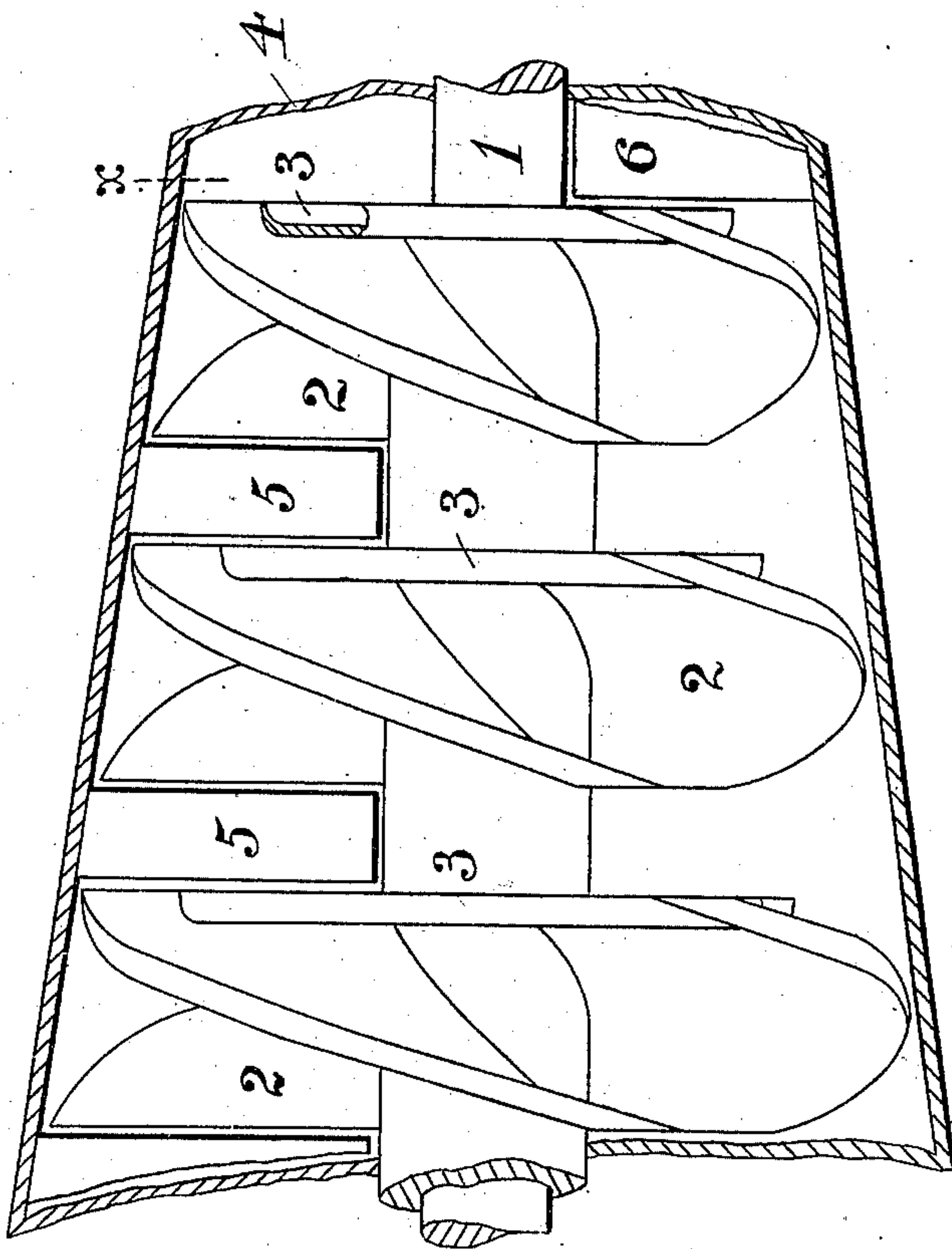


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN SKETCHLEY MORTON, OF OAKLAND, CALIFORNIA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 671,090, dated April 2, 1901.

Application filed April 9, 1900. Serial No. 12,234. (No model.)

To all whom it may concern:

Be it known that I, JOHN SKETCHLEY MORTON, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Pumps; and I 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 simple and efficient means for raising or moving water or other fluids in large volumes.

Described generally this invention consists of helical runners or fluid-impellers within a suitable casing, together with means for preventing wasteful internal circulation of the water within the casing or flow of water other than that in the direct course from intake to discharge.

In pumping with rotating devices of the general character of the present invention there are four directions of flow or travel possible to the water within the pump-casing under the impulse given it by the helical runner. They are, first, rotation in the direction of the motion of the runner; second, in a radial direction due to centrifugal force; third, motion in the direction and form of vortex eddies or rings, of which the hub of the runner occupies the central cavity, the periphery determining the large diameter of the annulus, the direction of the water forming the annulus being toward the discharge at the major periphery, and, fourth, longitudinally forward from intake to discharge.

So far as concerns the utilitarian objects the first and third results are simply waste of power. This waste it is one of the objects of the present invention to avoid.

The objects of this invention are accomplished by means of the constructions herein-after more fully described, reference being had to the accompanying drawings.

Figure 1 is a sectional elevation of the device. Fig. 2 is a section of the casing show-

ing some of the runners on an enlarged scale. Fig. 3 is a transverse section through x of Fig. 2.

Referring to the drawings, 1 is a rotatable shaft provided with a double series of runners or propeller shaped fluid-impelling devices 2, secured thereon. The elements of one series are made with a right-hand pitch and the elements of the other series are made with a left-hand pitch. The two opposing series are set on the shaft at some distance apart. Each element of the series is preferably provided with a plate or shallow cup 3, of somewhat less diameter than the runner, on the forward face of which it is secured or into which it is inlet, but of larger diameter than the hub. (Shown particularly in Figs. 2 and 3.) Each element of each series is secured upon the shaft at a little distance from its succeeding neighbor, preferably a distance not exceeding the width of the individual element, and the individuals of the series are preferably made diminishing in diameter from the suction to the discharge end of the series.

A suitable casing 4 concentrically surrounds the multiple series of runners, and between the adjacent elements of each series are provided radial plates 5, adapted to prevent the rotation of the fluid stream between the elements of the multiple runners. Radial plates 6 are also placed between the opposing sets of runners, adapted to effect a like purpose, and plates 7 are also placed to effect the same purpose with respect to the fluid contiguous to the initial element of each series.

A bifurcated discharge-pipe 8 may connect the discharge ends of the casings surrounding the opposing runners to provide for the unification of the separate streams emerging therefrom into a more convenient form of a single discharge. Similarly a bifurcated suction-pipe 9, formed in easy curves, may connect the opposite induction ends of the casing with the more convenient form of a single suction-pipe.

Suitable bearings 10 may support the driving-shaft 1 at proper intervals and provide for the exit of the shaft through the ends of the inclosing casing. Any suitable power connections may be provided. For simplic-

ity I have shown the belt-pulley 11 secured upon one end of the main shaft for this purpose.

In operation the rotation of the blades 2 tends to set up motion in the water in the four directions referred to in the opening paragraphs of the specification; but the annular rotation of the water is prevented by the longitudinal plates 5, and the vortex-eddies are prevented by the concentric plates 3. Thus there remains but one direction in which the power imparted to the runners can impel the water, and that is forward, due to the combined action of the centrifugal force and the angularity of the blades.

Under these circumstances it may be found desirable or convenient to have the runners of uniform diameter, or the runners may be made of uniform diameter with the exception of the initial runner of each series. Other changes in the arrangement of the opposing runners may suggest themselves or be suggested by the conditions under which the invention is intended to be employed without departing essentially from the invention herein disclosed. I therefore do not desire to confine myself to the exact form, proportion, or arrangement of the parts herein set forth; but

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

1. Means for raising or moving water or other fluids, comprising a series of helical runners secured upon a rotatable shaft in combination with a substantially similar series of reversely-formed helical runners, each element of each series being separated from its adjacent element and being provided with a plate upon one of its faces of less than its own diameter but larger than that of the hub and means adapted to prevent the rotation of the fluid between the adjacent elements of each series of runners.

2. Means for raising or moving water or other fluids, comprising a series of helical runners of ununiform diameters secured upon a rotatable shaft in combination with a substantially similar series of reversely-formed helical runners, each element of each series being separated from its adjacent element and being provided with a plate upon one of its faces of less than its own diameter but larger than that of the hub and means adapted to prevent the rotation of the fluid between the adjacent elements of each series of runners.

3. Means for raising or moving water or other fluids, comprising a series of helical runners secured upon a rotatable shaft in combination with a substantially similar series of reversely-formed helical runners, each element of each series being separated from its adjacent element and being provided with a plate upon one of its faces of less than its

own diameter but larger than that of the hub and means adapted to prevent the rotation of the fluid between the adjacent elements of each series of runners, a casing surrounding and inclosing the multiple runner provided with suitable induction and eduction pipes.

4. Means for raising or moving water or other fluids comprising a series of helical runners of ununiform diameters secured upon a rotatable shaft in combination with a substantially similar series of reversely-formed helical runners, each element of each series being separated from its adjacent element and being provided with a plate upon one of its faces of less than its own diameter but larger than that of the hub and means adapted to prevent the rotation of the fluid between the adjacent elements of each series of runners, a casing surrounding and inclosing the multiple runner provided with a suitable induction and eduction pipe.

5. Means for raising or moving water or other fluids, comprising a series of helical runners secured upon a rotatable shaft in combination with a substantially similar series of reversely-formed helical runners, each element of each series being separated from its adjacent element and being provided with a plate upon one of its faces of less than its own diameter and larger than that of the hub and means adapted to prevent the rotation of the fluid between the adjacent elements of each series of runners, a suitable casing surrounding and inclosing the multiple runner provided with a bifurcated induction-pipe and a bifurcated eduction-pipe adapted to connect the induction and the eduction ends of the casing with a single induction and eduction pipe respectively.

6. Means for raising or moving water or other fluids, comprising a series of helical runners of ununiform diameters secured upon a rotatable shaft in combination with a substantially similar series of reversely-formed helical runners, each element of each series being separated from its adjacent element and being provided with a plate upon one of its faces of less than its own diameter but larger than that of the hub and means adapted to prevent the rotation of the fluid between the adjacent elements of each series of runners, a suitable casing surrounding and inclosing the multiple runner provided with a bifurcated induction-pipe and a bifurcated eduction-pipe adapted to connect the induction and the eduction ends of the casing with a single induction and eduction pipe respectively.

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