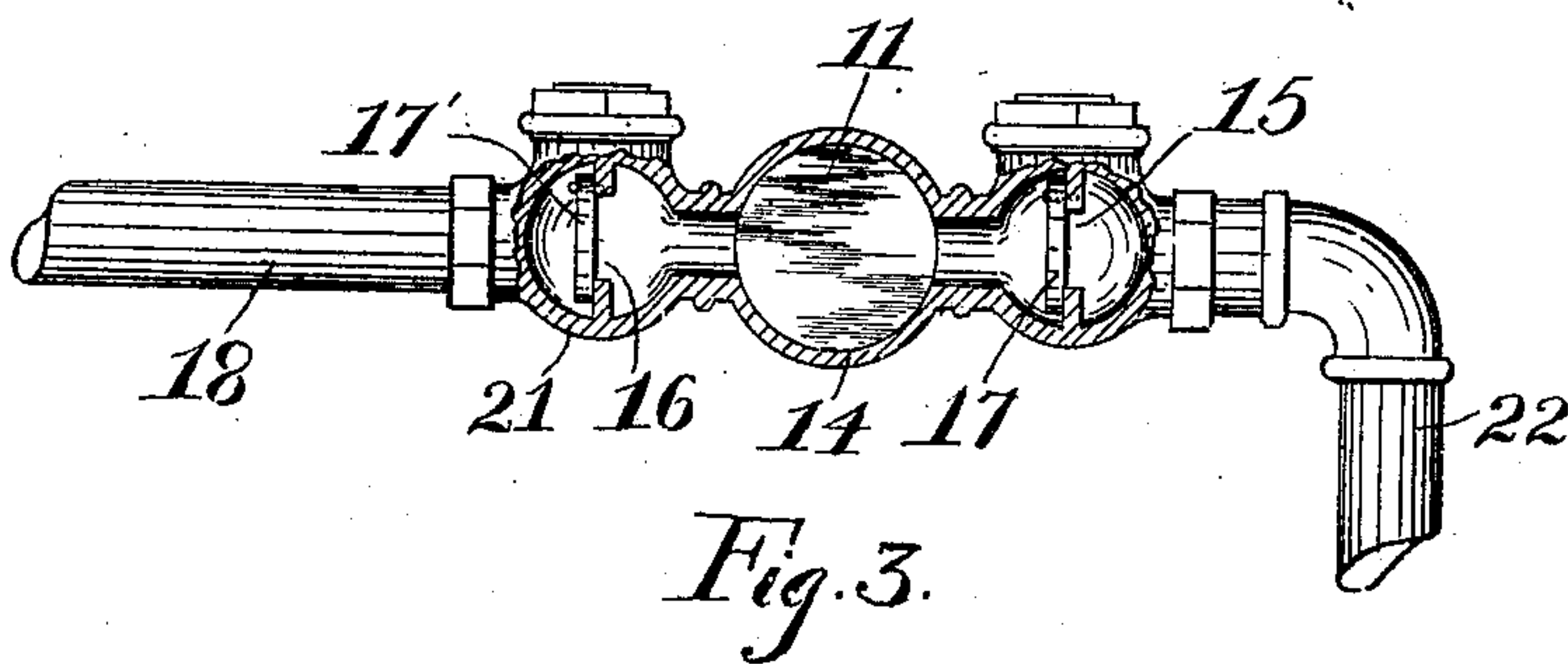
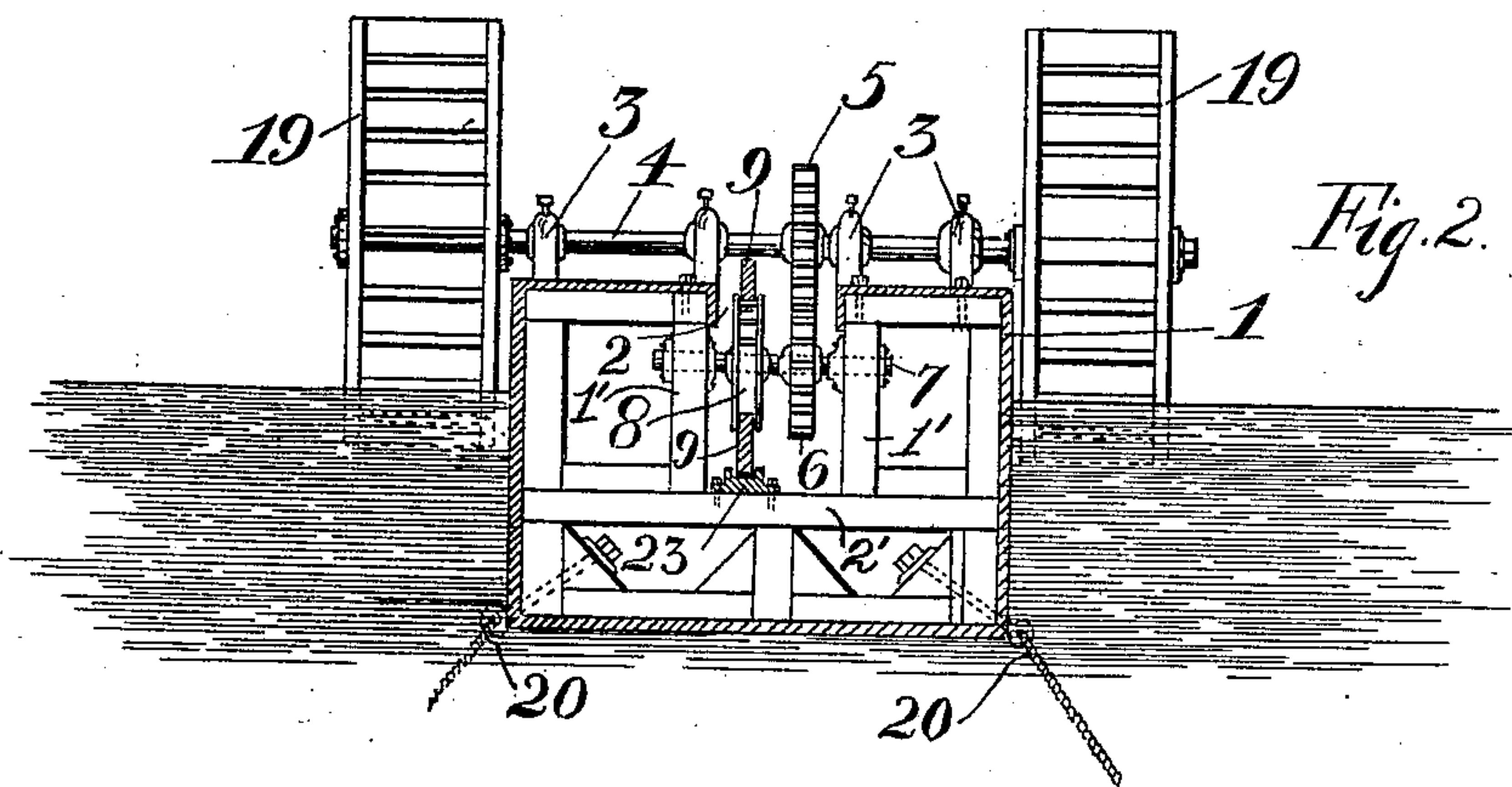
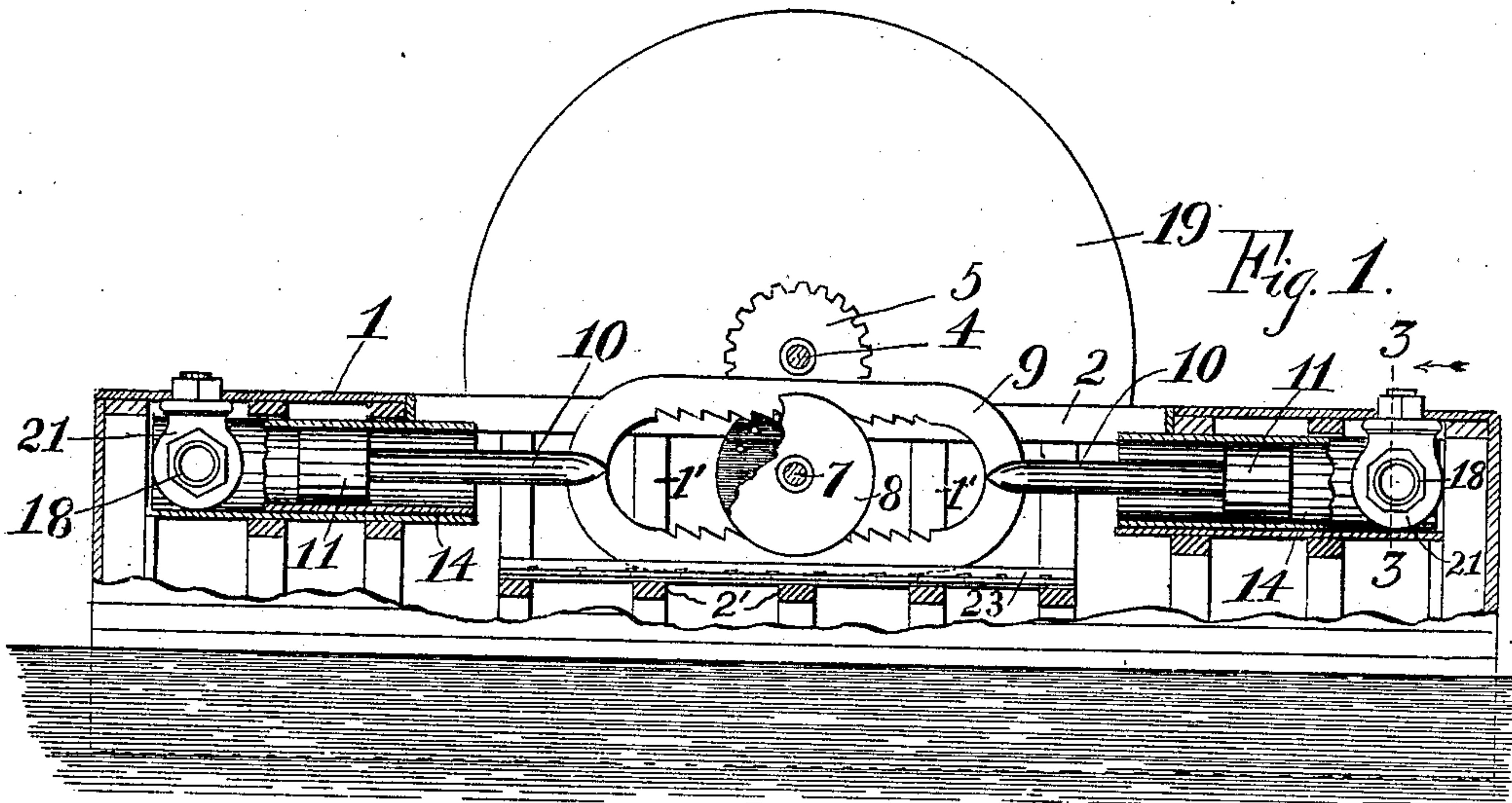


No. 828,412.

PATENTED AUG. 14, 1906.

G. A. LARSON.
CURRENT MOTOR.

APPLICATION FILED MAR. 28, 1905.



WITNESSES:
Refuse B. Clark
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UNITED STATES PATENT OFFICE.

GUSTAF ADOLF LARSON, OF SEATTLE, WASHINGTON.

CURRENT-MOTOR.

No. 828,412.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed March 28, 1905. Serial No. 252,582.

To all whom it may concern:

Be it known that I, GUSTAF ADOLF LARSON, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Current-Motors, of which the following is a specification.

My invention relates to certain new and useful improvements in current-motors; and the primary object thereof is to provide an efficient yet simple construction of this type which will be operated to pump water from the river for various purposes.

Further objects and advantages will be set forth in the following description and those features of construction upon which I desire protection particularly set forth in the appended claim.

In the accompanying drawings, in which like numerals of reference indicate like parts throughout the several views, Figure 1 is a fragmentary longitudinal sectional view of my improvement. Fig. 2 is a cross-sectional view thereof; and Fig. 3 is a cross-sectional view on line 3 3 of Fig. 1, showing the arrangement of the valves to the pump-cylinder.

I mount the drive mechanism of my invention upon a suitable float 1, which can be of any desired form or construction. In the present showing, however, an open hull is illustrated, the same having a narrow longitudinal opening, as 2, in its top and provided on opposite sides thereof with suitable standards or brackets 3, in which the drive-shaft 4 is journaled. 5 indicates a pinion fixed to the shaft and projecting through the opening in the top of float 1 and meshing with a pinion 6, fast on driven shaft 7, which is suitably supported in vertical line with the shaft 4 for rotation in vertical frame-walls 1' within the casing or hull 1 on each side of the said opening 2. A pin-wheel 8 is also secured to this shaft 7 and is adapted to have its pins alternately engage the opposite teeth of mangle-rack 9, whereby said rack is caused to reciprocate, and to the opposite ends of this rack I connect by rods 10 the pistons 11, which latter operate in pump-cylinders 14, said cylinders 14 being arranged beneath the float-top on opposite ends of and in horizontal line with the mangle-rack.

The pump-cylinders are provided with suitable inlet and outlet ports 15 and 16, re-

spectively, and suitable valves, as 17 and 17', of the well-known flap type control these ports. By this construction the pistons 11 on their rearward stroke draw in water into the pump-cylinders through ports 15, the valves 17 swinging inwardly during this movement of the pistons, and on the forward stroke of said pistons valves 17 are closed and valves controlling outlets 16 are opened by the pressure of the water, and therefore the water in said cylinders will be forced from said cylinders into pipes, as 18. These pipes 18 can be extended to the shore, if desired, so as to convey the water to tanks or for various other purposes.

Connected to the opposite ends of drive-shaft 4 are suitable water-wheels 19, which are provided with suitable blades or buckets, as shown, and are adapted to be driven by the flowing water.

In operation the float 1 is anchored in the river or other stream possessed of a swift current, cables, as 20, being attached to the anchors, and pipes 18 are then secured to the valve-casings 21. The flowing water will then operate the wheels 19 and through gearing 5 and 6 and pin-wheel 8 cause the reciprocation of the mangle-rack 9, as heretofore stated. Pipes 22 communicate with the inlet-ports and serve as a means for conveying the water from the river to the cylinders 14. The mangle-rack 9 is preferably mounted for sliding movement in a guide 23, secured to a platform 2', underlying the opening 2 and supporting the said vertical frame-walls 1', the particular construction, however, of this guide, as well as the detail construction of the various minor parts, can be readily varied without departing from the spirit of my invention, and I therefore reserve the right to make such alterations and changes as fall within the scope of the appended claim. It will be observed that the said guide 23 and shaft 4 will arrest any vertical play of the mangle-rack, thus preventing disengagement of the mangle-rack teeth from the pin-wheel 8.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States of America, is—

A current-motor comprising a float, the casing thereof being provided in its top with a narrow longitudinal opening, vertical frame-walls within the casing on each side of the opening, a platform underlying the said

opening and forming a support for the vertical frame-walls, a horizontal shaft journaled in said vertical frame-walls; a pin-wheel and a gear-wheel rigidly mounted on the shaft between the vertical frame-walls, a mangle-rack surrounding the pin-wheel and operated thereby, a second horizontal shaft mounted above the float in vertical line with the first-named shaft, a current-wheel mounted on each end of the second shaft adjacent the sides of the float, a pinion on the second shaft projecting through the top opening and meshing with the gear-wheel on the first shaft, pump-cylinders arranged be-

neath the float-top on opposite ends of and in horizontal line with the mangle-rack, pistons operating within the cylinders, rods rigidly connecting the pistons with the rack, and a guide mounted on the said platform beneath the mangle-rack, said guide and second-mentioned shaft limiting vertical play of the mangle-rack.

Signed at Seattle, Washington, this 15th day of March, 1905.

GUSTAF ADOLF LARSON.

Witnesses:

STEPHEN A. BROOKS,
ARLITA ADAMS.