No. 891,671. PATENTED JUNE 23, 1908.

R. E. COON.

CURRENT WATER MOTOR.

APPLICATION FILED JULY 3, 1907.

3 SHEETS—SHEET 1.

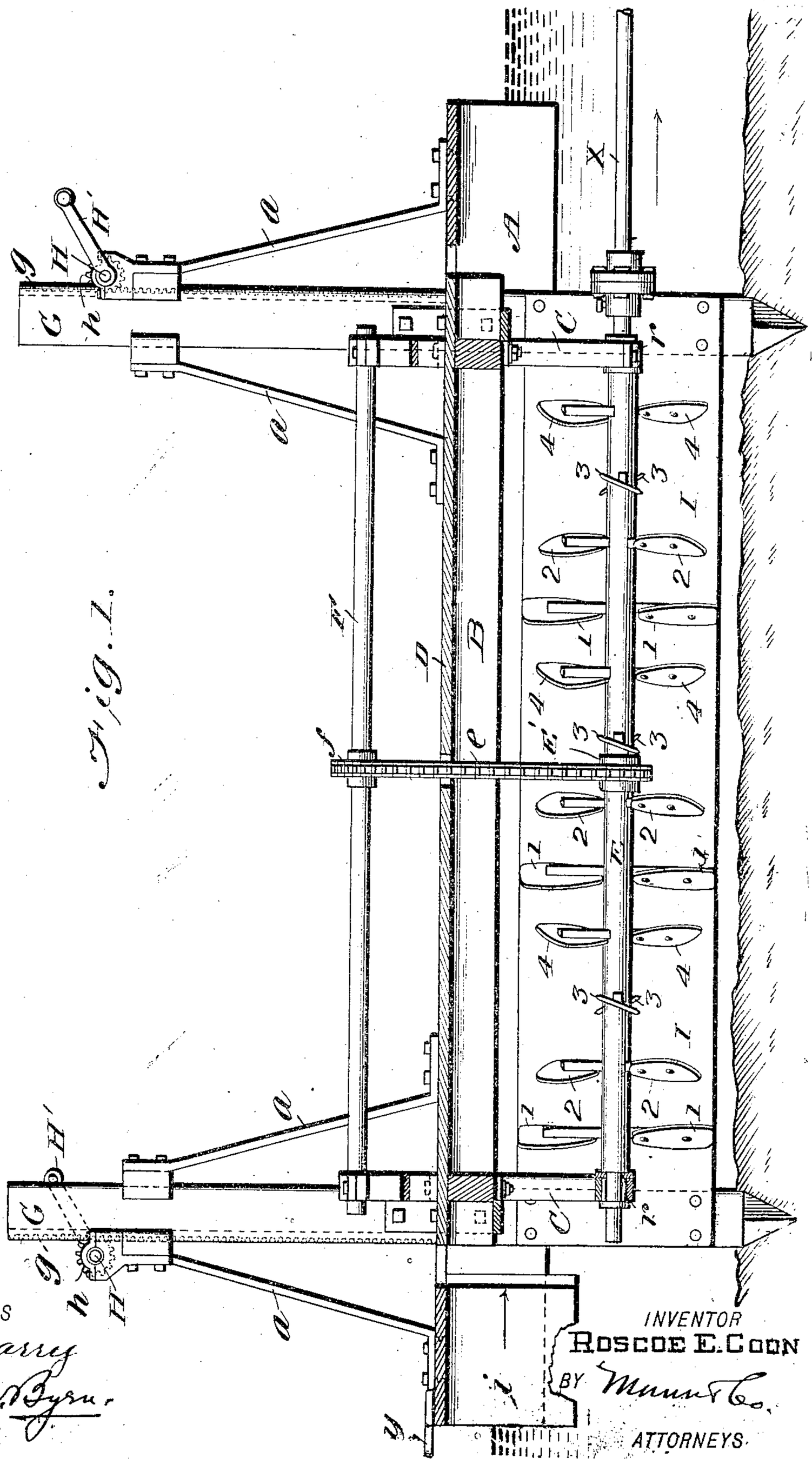

Fig. 1.

WITNESSES

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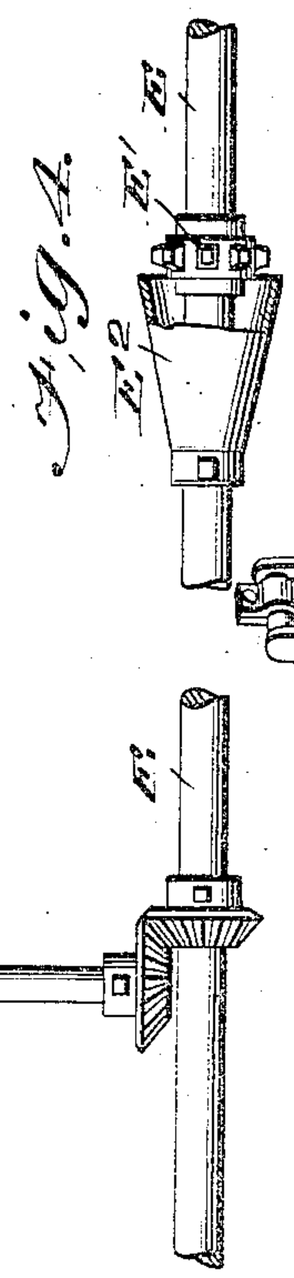
Fig. 4.

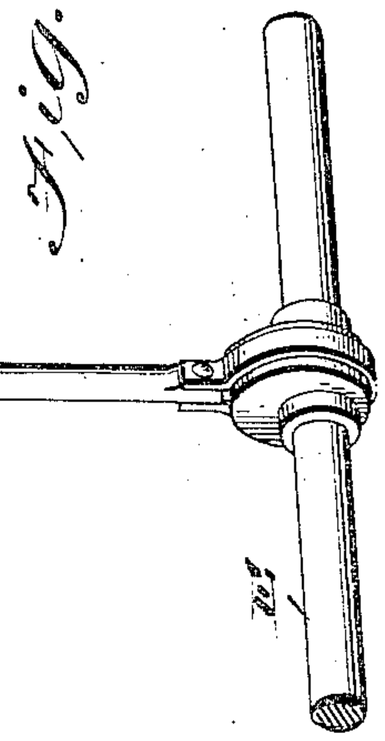
Fig. 6.

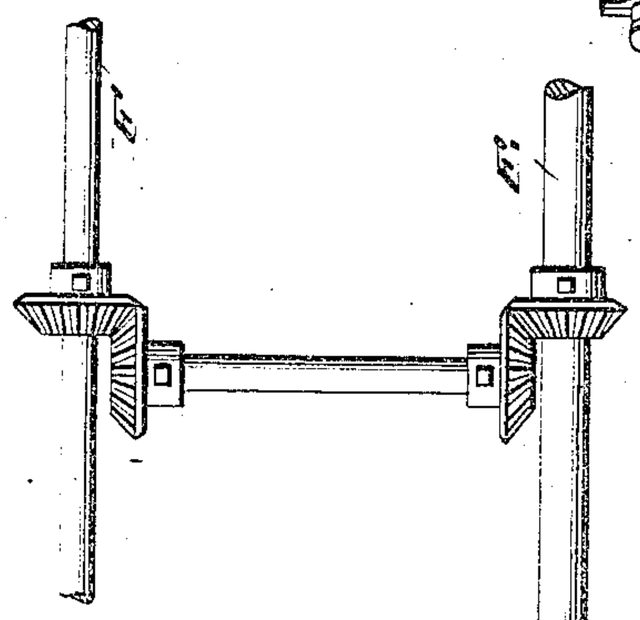
Fig. 5.

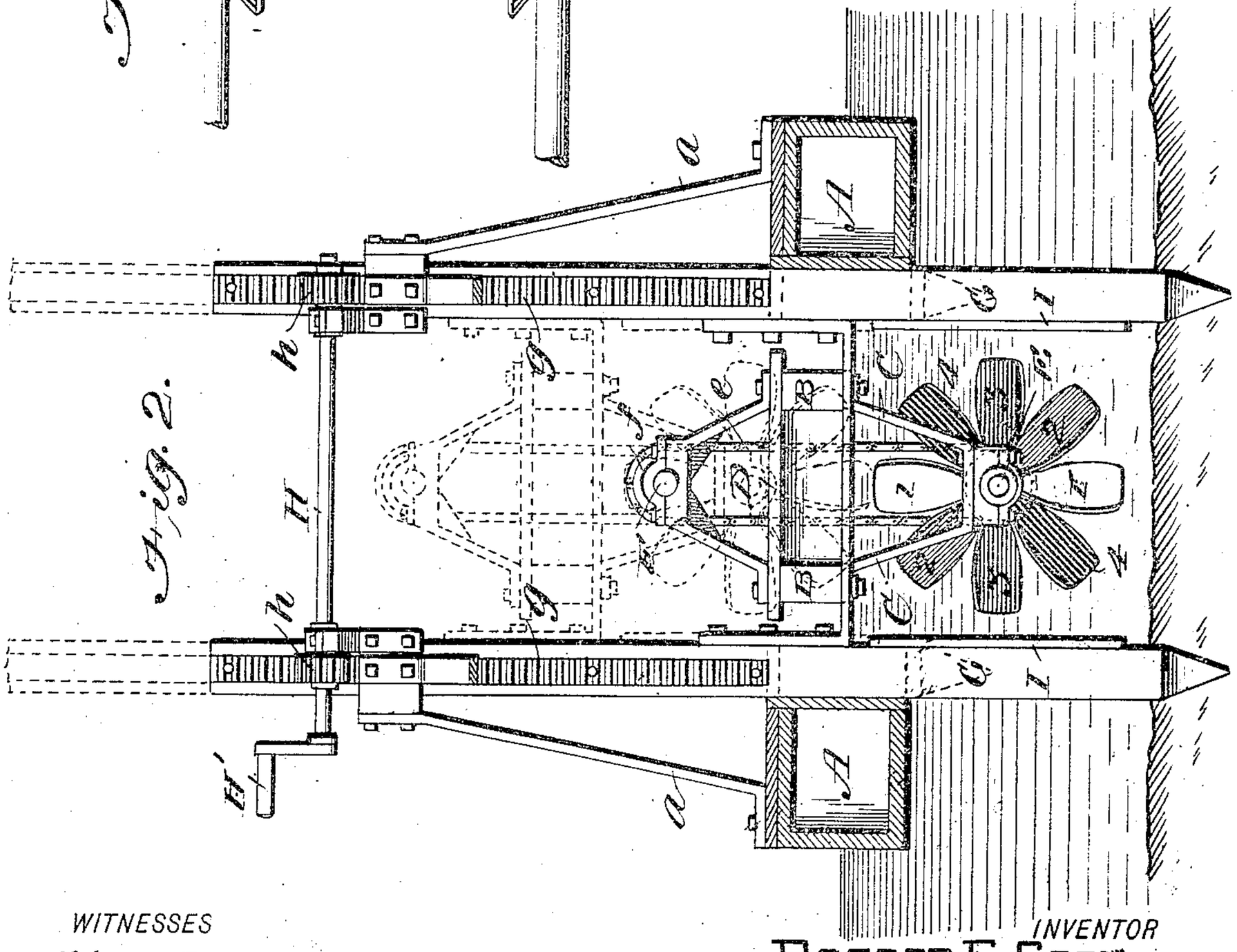
Fig. 2.

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3 SHEETS—SHEET 3.

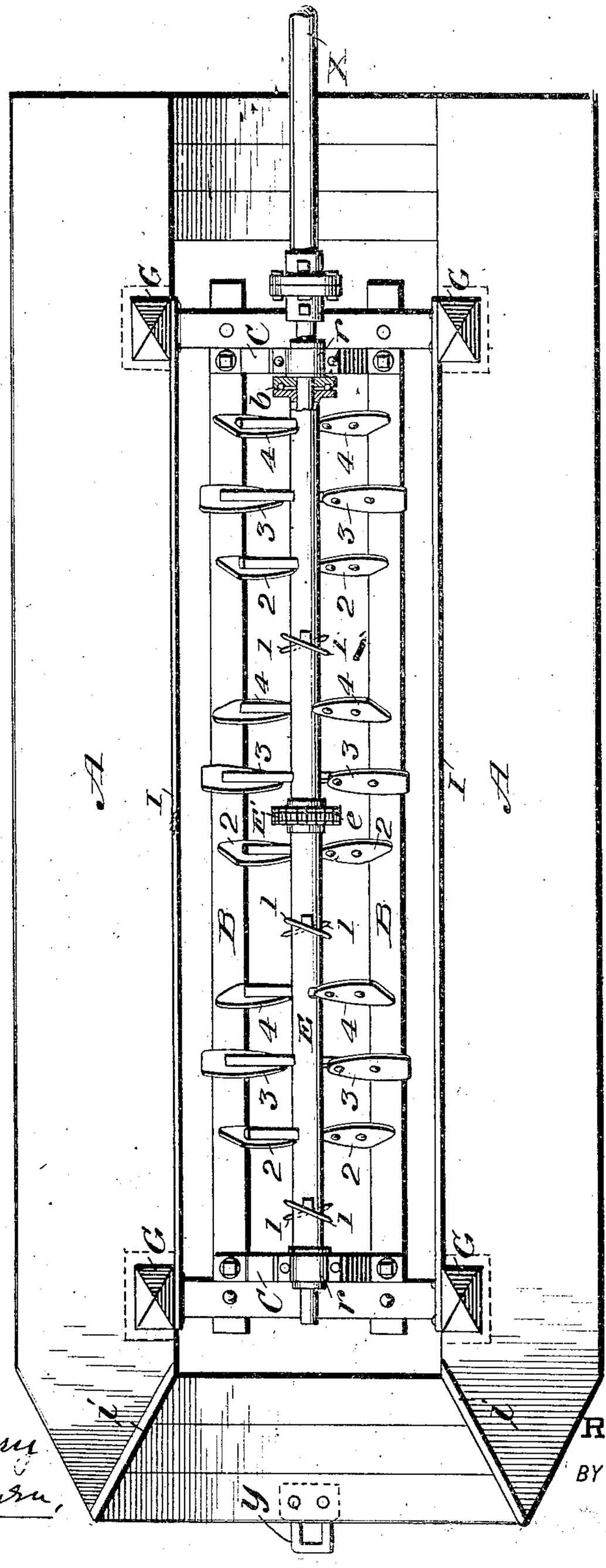

Fig. 3.

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UNITED STATES PATENT OFFICE.

ROSCOE EMERALD COON, OF PORTLAND, OREGON.

CURRENT WATER-MOTOR.

No. 891,671. Specification of Letters Patent. Patented June 23, 1908.

Application filed July 8, 1907. Serial No. 382,039.

To all whom it may concern:

Be it known that I, ROSCOE EMERALD COON, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Current Water-Motors, of which the following is a specification.

The object of my invention is to provide a current water motor of high power and of cheap installation which shall be specially adapted for use in running streams for pumping water for irrigating and mining purposes, but which is applicable for furnishing power for all purposes.

It relates to that type of current motors in which a series of inclined blades are arranged at intervals in different angular relation to each other along a relatively long shaft immersed in a flowing stream and it consists in the novel construction of the parts with means for adjustment as hereinafter fully described with reference to the drawings, in which

Figure 1 is a vertical longitudinal section. Fig. 2 a vertical transverse section. Fig. 3 a bottom plan view and Figs. 4, 5 and 6 are details showing modifications.

In the drawing, Figs. 2 and 3, A A represent two parallel floats connected together at opposite ends after the manner of the catamaran or twin boat and which together have sufficient bouyancy to float the entire apparatus. These boat-shaped floats are closed on all sides to form water tight compartments and have wedge shaped forward ends, as seen in Fig. 3, to facilitate passage through the water when transporting the device and for the purpose of making a converging or funnel shaped forward end to catch the current water and concentrate it in a stream between the two floats.

Between the two floats A A, see Fig. 2, is arranged a movable and vertically adjustable deck D having two heavy longitudinal sills B B extending nearly the full length of the apparatus. To these sills are securely bolted strong hanger frames C, Figs. 1 and 2, which carry in suitable bearings the main motor wheel shaft E. This shaft extends the full length of the apparatus and turns in roller bearings *r*, Fig. 1, and has also a ball bearing *b*, Fig. 3, to receive the longitudinal thrust. This motor wheel shaft is provided along its length with a large number of radial blades arranged in diametrical pairs, as seen at 1, 1, 2, 2, 3, 3, and 4, 4. These pairs of blades are spaced two feet apart along the shaft and occupy an angular relation to each other of one eighth of a circle difference in their arrangement around the shaft, and the shaft has the same arrangement of blades repeated in every eight feet along the shaft which in a shaft 25 feet long will have 24 blades. The radial length of the blades is preferably 3½ feet and the angle which the plane of the blade makes to the plane of revolution is 22½°. These proportions I find give remarkable results as to power and efficiency, owing to the fact that the spacing avoids the carrying of dead water and the angular position of the blades gives the best results of power from the moving current of water in which they are immersed.

When the apparatus is arranged with the bow portion up stream and is anchored, the elongated motor wheel is completely immersed in the water between the two floats as seen in Fig. 2 and the water striking the blades turns the shaft E.

To take off motion from this shaft various mechanical connections may be employed. As shown in Figs. 1, 2, 3, a sprocket wheel E′ on the shaft E is geared to a chain belt *e* which extends up to a corresponding sprocket wheel *f* on a horizontal shaft F journaled in bearings on the movable deck D. This shaft F is designed to be provided with pulleys, cranks or other devices for utilizing to power in any well known way.

Instead of connecting the two shafts E and F by a chain and sprocket wheels, I may employ bevel gears and a right angular shaft as seen in Fig. 5, or an eccentric and crank as seen in Fig. 6 and I may use any number of these connections.

When the stream contains grass or rubbish, some means for preventing the fouling of the submerged gear is desirable. In Fig. 4 I have provided a conical deflector E^2 on the shaft on the up stream side of the sprocket wheel which throws off the grass and rubbish therefrom.

To hold the current motor stationarily in place against the pull of the stream an anchorage attachment *y*, Fig. 1, is placed at the bow to which a cable is attached and is carried to and made fast to an anchorage on the banks.

Vertically adjustable posts G are also provided like those on a dredging machine which are pointed at their lower ends to enter the river bottom. There are four of

these posts arranged in two pairs, one pair at each end and inside the two floats A A. The posts are provided with rack bars *g* and each pair is adjusted vertically by pinions *h* on a transverse shaft H which pinions mesh with the rack bars on the posts. The shaft H is turned by a crank H′ or by a power gearing and the shaft is sustained in bearings in derricks or upright braced frames *a*.

To the posts G G is connected the movable deck D and with it the current motor wheel, so that said posts not only aid in anchoring the apparatus to place, but, when elevated a sufficient distance, raise also the current wheel as seen in dotted lines in Fig. 2. This is important in adjusting it to escape half buried logs and stones in the river bottom and it also permits the motor wheel to be lifted entirely above the water for transportation of the boat to another point or for inspection and repairs.

On each side of the motor wheel is arranged a continuous guard I, Fig. 2, which extends the full length of the wheel as seen in Fig. 3. These two guards form a passage for the water below the floats which concentrates the flow of the water on the wheel and very greatly increases its efficiency. These guards may be conveniently mounted on the posts G so as to be adjustable therewith.

For causing a larger amount of water to enter the central channel two convergent fins *i*, *i*, Fig. 3, are arranged at the bow of the boat and on the inner inclined faces of the same.

In making use of my invention I propose where great power is desired to use a series of these current motors, arranged in alinement in the stream and in such case their shafts will be connected coaxially by a coupling shaft X, as seen in Figs. 1 and 3.

I claim

1. A current motor, consisting of two elongated boat-shaped floats connected together at the bow and stern, an intermediate deck arranged between the floats and having pendent shaft bearings on its under side, a wheel shaft journaled in said bearings and provided with inclined blades, bearings mounted above the deck, a driven shaft arranged in said bearings above the deck parallel with the wheel shaft, gearing connecting the two shafts and means for adjusting vertically the deck and the two shafts.

2. A current motor, consisting of two elongated boat-shaped floats connected together at the bow and stern, an intermediate deck arranged between the floats, a water wheel shaft with inclined blades spaced along its length, pendent bearings for the same connected to the lower side of the deck, a driven shaft arranged above the deck, gearing connecting the two shafts and vertically adjustable side guards arranged on opposite sides of the wheel shaft and below the level of the floats to concentrate the flowing water on the wheel.

3. A submerged current water wheel consisting of a shaft having radial blades set at an inclination along the shaft, a gear fixed rigidly to the shaft for taking off the motion and a deflector arranged to prevent the fouling of the same with grass and debris.

4. A current motor consisting of two elongated boat-shaped floats connected together at the bow and stern, a movable deck between the floats, a horizontal wheel shaft arranged in bearings on the under side of the deck, a driven shaft arranged in bearings on top of the deck, vertically adjustable posts connected to the deck to sustain the same, said posts being arranged to engage the river bottom and means for raising and lowering the posts.

5. A current motor consisting of two elongated boat-shaped floats connected together at the bow and stern, a movable deck between the floats, a horizontal wheel shaft arranged in bearings on the under side of the deck, a driven shaft arranged in bearings on top of the deck, vertically adjustable posts connected to the deck to sustain the same, said posts being arranged to engage the river bottom, means for raising and lowering the same and two parallel side guards arranged on opposite sides of the wheel shaft and connected to the vertical posts.

ROSCOE EMERALD COON.

Witnesses:
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EDW. W. BYRN.