

B. W. MASTERSON.
 WATER WHEEL.
 APPLICATION FILED APR. 28, 1909.

Patented Mar. 22, 1910.

952,919.

2 SHEETS—SHEET 1.

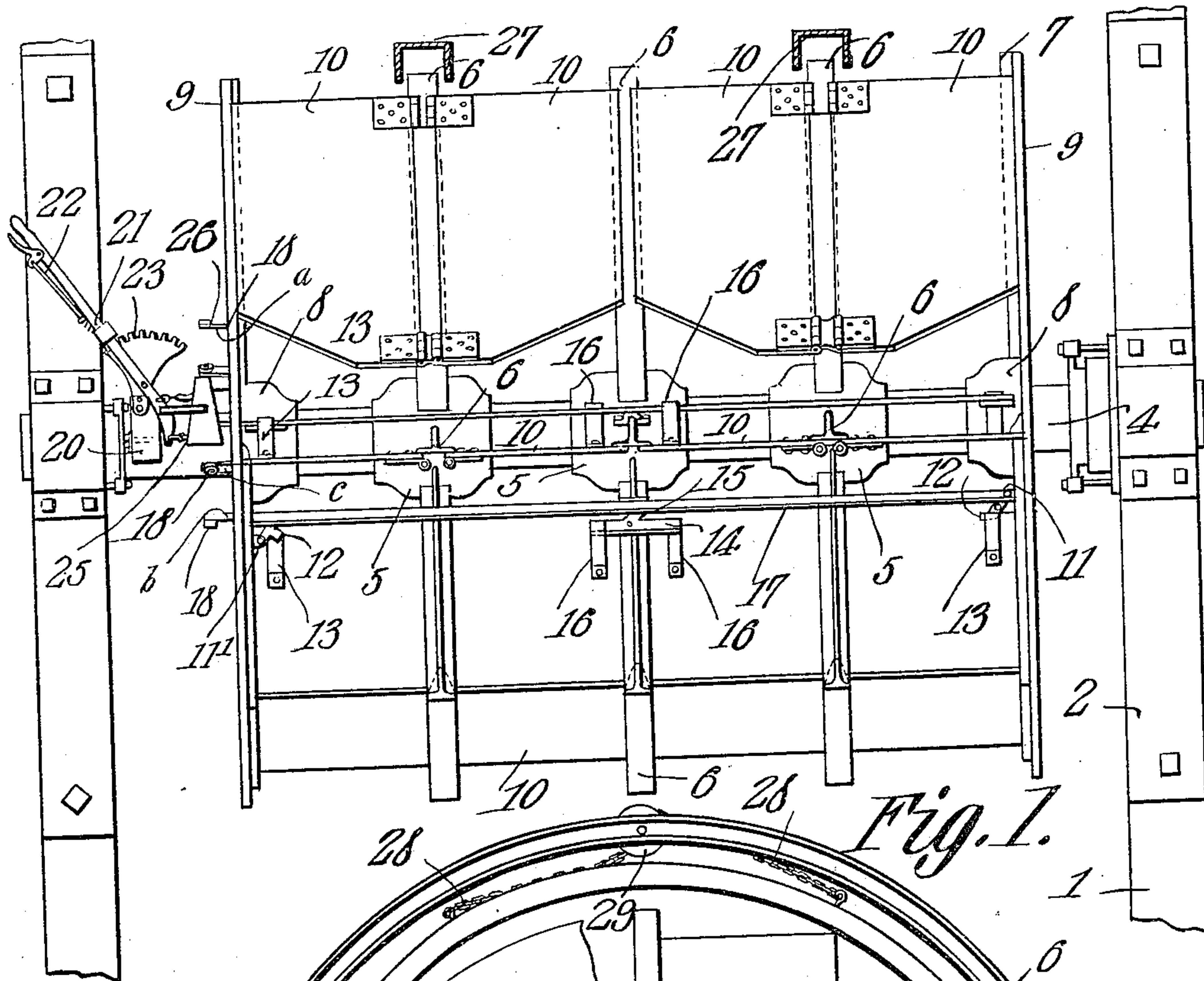


Fig. 1.

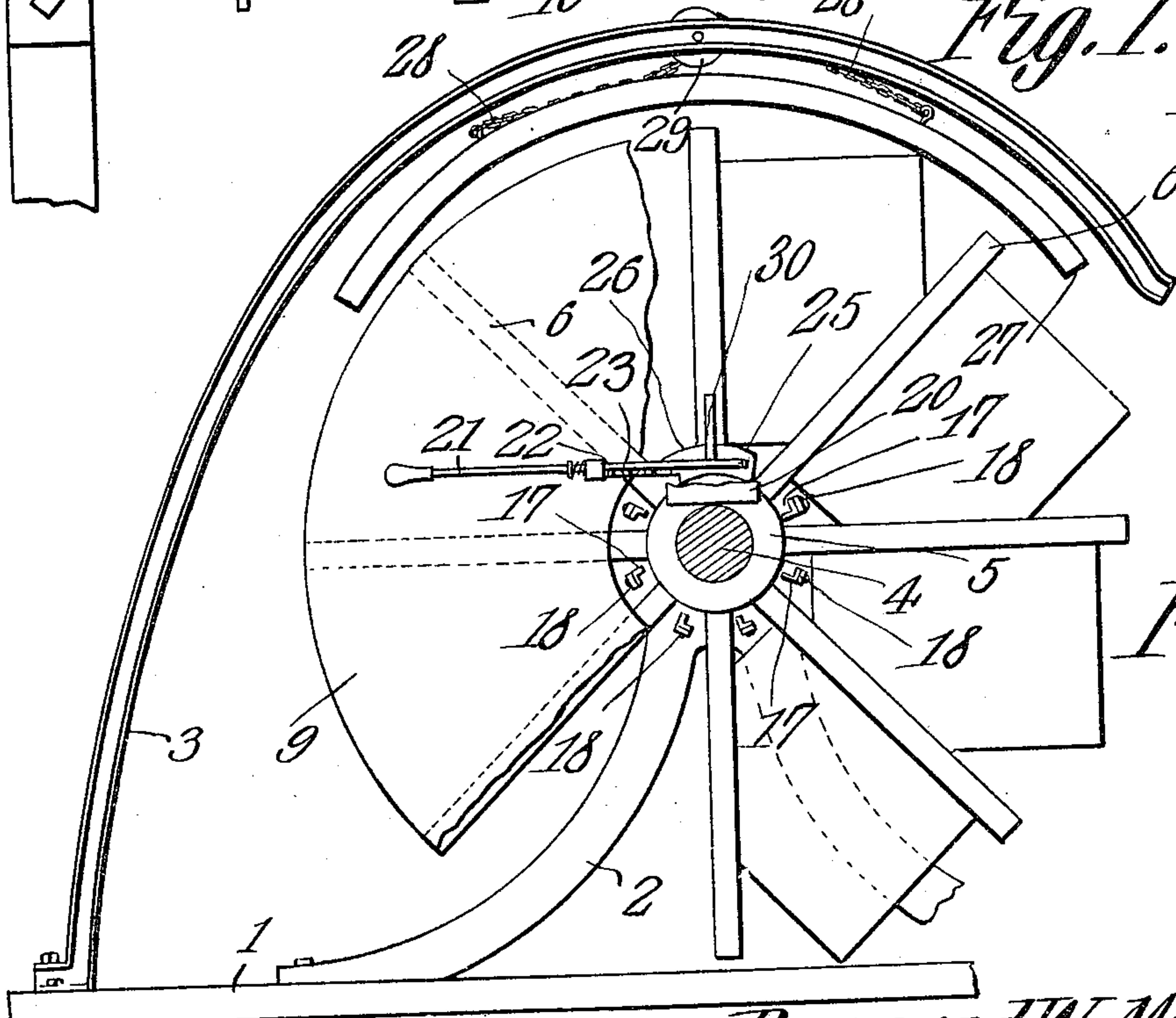


Fig. 2.

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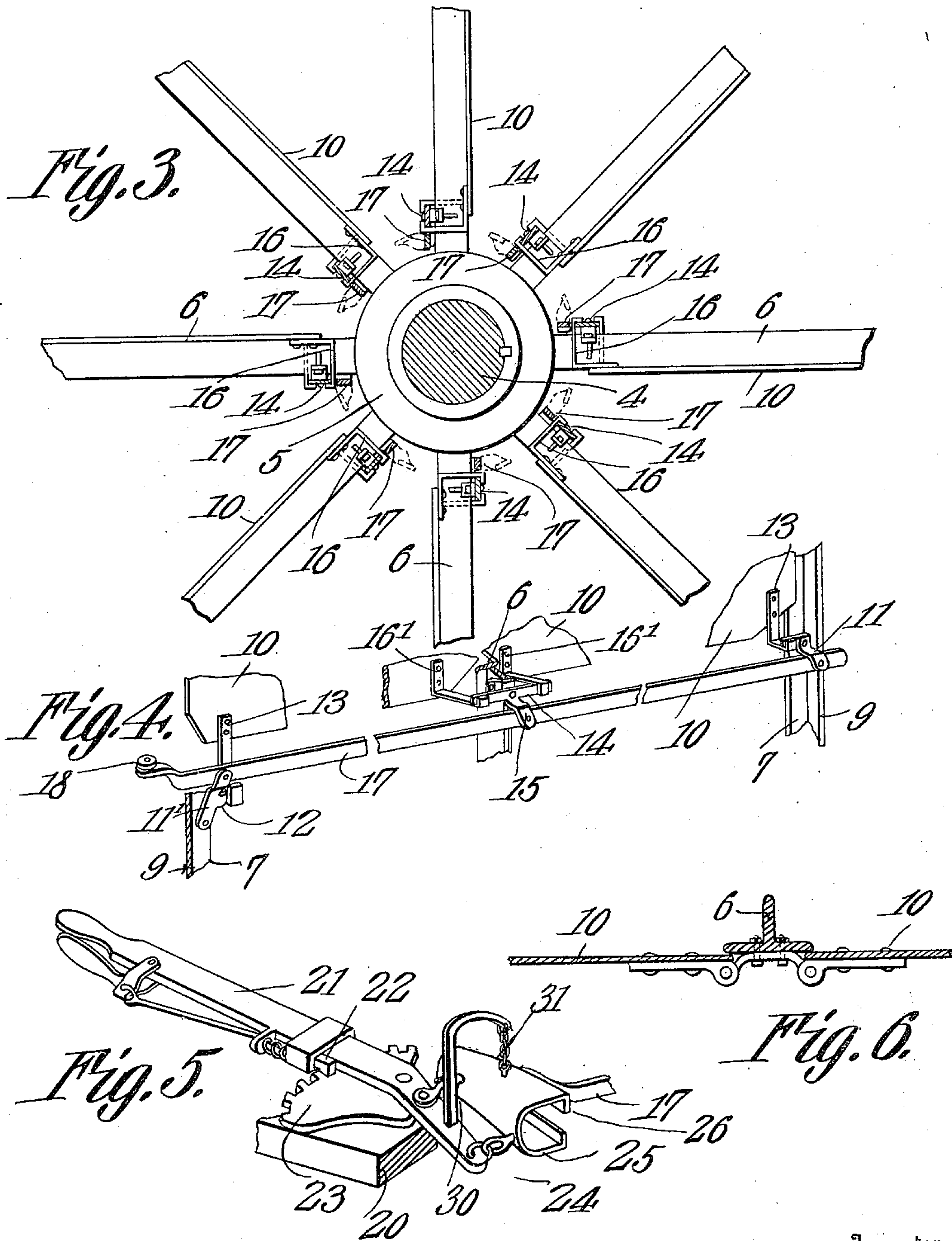
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UNITED STATES PATENT OFFICE.

BERNARD W. MASTERSON, OF LAREDO, TEXAS.

WATER-WHEEL.

952,919.

Specification of Letters Patent.

Patented Mar. 22, 1910.

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To all whom it may concern:

Be it known that I, BERNARD W. MASTERSON, a citizen of the United States, residing at Laredo, in the county of Webb and State of Texas, have invented a new and useful Water-Wheel, of which the following is a specification.

The objects of the invention are, generally, the provision, in a merchantable form, of a device of the class above mentioned which shall be inexpensive to manufacture, facile in operation and devoid of complicated parts; specifically, the provision of a motor which will operate with equal facility whether totally or partially submerged; the provision of a motor embodying pivoted blades, and means for locking the blades in closed position when the wheel of the motor is partly submerged and for locking the said blades when the motor is nearly or totally submerged; other and further objects being made manifest hereinafter as the description of the invention progresses.

The invention consists in the novel construction and arrangement of parts, hereinafter described, delineated in the accompanying drawings and particularly pointed out in that portion of this instrument wherein patentable novelty is claimed for certain distinctive and peculiar features of the device, it being understood that within the scope of what hereinafter thus is claimed, divers changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Similar numerals of reference are employed to denote corresponding parts throughout the several figures of the drawings.

In the accompanying drawings:—Figure 1 shows my invention in top plan, the doors being locked; Fig. 2 is an end elevation showing the doors open and rising out of the stream; Fig. 3 shows my invention in vertical transverse section, the doors being locked; Fig. 4 is a detail perspective of the locking mechanism; Fig. 5 is a detail perspective of the means for actuating the locking mechanism; and Fig. 6 is a transverse section showing in detail one of the spokes and the doors which are mounted to swing thereon.

In carrying out my invention I provide, primarily, a suitable base designed to be

anchored in the bed of a stream. Rising from either side of this base are frame posts in which are journaled for rotation the opposite ends of a main shaft. These frame posts may be pillars of rock or concrete or they may be fashioned from metal. The main shaft is provided with a series of spaced hubs having radial spokes to which are pivoted the doors or paddles, in such position that when the motor is rotating in a stream, these doors or paddles will be closed after the spokes have passed their vertical centers and are descending on the upstream side of the wheel. Each door will remain in this position until after the spoke has passed its vertical center on the lower side of the shaft and starts to raise when the door will gravitate into open position, so as to present a feathering edge to the water through which it passes.

A suitable operating means is employed to lock these doors so that each door after passing the vertical center of the spoke on the lower side of the shaft will, when desired, be locked against movement on the ascent of the spoke. The structure employed to perform this operation consists in a plurality of latches having their intermediate portions pivoted to the spokes and their upper ends designed to engage suitable keepers mounted on the faces of the doors. The opposite ends of the latches are pivoted to an operating rod disposed between the separate sets of spokes parallel with the main shaft. Upon one end of the motor a lever is mounted within easy reach of the operator and connection is made between the lever and the end of the operating rod by means of a suitable yoke adapted to engage the ends of the operating rod, whereby to force the latches into or out of engagement with the keepers.

The base 1 may be any suitable structure, its length corresponding to the length of the motor and it may extend partially or entirely across the stream in which it is anchored. A frame post 2 rises from the base 1 at either end thereof. A plurality of grating rods 3 are provided and these grating rods, as shown in Fig. 2, are arcuate in outline, their lower terminals being rigidly assembled with the base 1, their upper terminals curving above the motor to house the same against the intrusion of floating objects. There may be any number of these grating rods spaced at suitable distances

apart and since their function is well known, I have considered the showing of them made in Fig. 2 to be sufficient.

Each of the frame posts 2 is provided with a journal box having the usual packing devices to prevent the entrance of water or dirt, and in these boxes are journaled for rotation the opposite ends of the main shaft 4. A series of equally spaced hubs 5 are keyed to the main shaft 4 and radiating from these hubs are spokes 6. The spokes may be made of any suitable material and may be of any shape, being bolted or otherwise secured in suitable sockets provided for their reception in the hub. In the present instance they are formed from a single piece of metal substantially T-shaped in cross section, as best shown in Fig. 6.

In the construction shown in Fig. 1 the shaft is provided with three hubs each having, as shown in Fig. 2, eight spokes. It is to be understood, however, that the construction is by no means limited to this number, since it is obvious that a greater or less number may be employed without departing from the spirit of the invention. Disposed between each of the outer hubs and the frame posts 2 and keyed to the main shaft is a boxing 8, on the outer end of which is fitted the end plate 9, the same being provided with a rib 7 projecting from the said plate toward the center of the wheel. It is obvious that, if desired, this boxing 8 may be replaced by a hub of the construction denoted by the numeral 5 and that the end plate 9 may be replaced by the spokes 6.

Referring particularly to Fig. 1, it will be seen that each of the end spokes 6 supports a pair of doors 10. The latter may be of any suitable material and are designed to swing in opposite directions on their respective spokes. The adjacent edges of the middle doors 10 are adapted to be received by the center spoke 6, while the remote edges of the outer doors 10 are adapted to be received by the ribs 7 of the end plates 9.

In order to prevent the doors from swinging when the motor is submerged no deeper than the center of the shaft 4, the following manually operated mechanism is employed, consisting of a plurality of operating rods which are adapted to operate the latches to engage the keepers secured to the faces of the doors. The construction is such that one operating rod is placed longitudinally of the shaft 4 between two sets of spokes, as shown in Figs. 1 to 3.

The operating rods, the latches and keepers for each set of doors are similar in construction, so that a description of one will be sufficient for all.

In the following description, that end of the motor which is farthest removed from the lever operating mechanism shown in Fig. 1, will be termed the remote end of

the motor, while that end of the device which is closest to the lever operating mechanism will be termed the adjacent end thereof.

The construction of latch employed for the remote end of the motor consists of an oblong piece of metal 11, one end of which is pivoted to the rib 7 of the end plate 9, the lower end of the latch being pivoted to the operating rod 17. Referring particularly to Fig. 4 wherein the construction of the latch 11 is most clearly shown it will be seen that the end thereof which is pivoted to the rib 7 is provided with a laterally extending finger projecting inward from the end plate 9. The remote end door 10 is provided with a depending keeper 13 bent at its lower end to form a hook, and it will be seen that when the operating rod 17 is moved in the direction of its length, the finger of the latch 11 which is pivoted upon the rib 7 of the end plate will be moved into and out of engagement with the hooked portion of the keeper 13. The adjacent latch 11' is pivoted at its lower end to the rib 7 of the adjacent end plate 9, its upper end being pivotally connected with the operating rod 17. The latch 11' is provided with a finger 12 which projects inward from the adjacent end plate 9 to engage, below the operating rod 17, the hooked end of the keeper 13 which is carried by the adjacent end door 10. By referring to Fig. 4, it will be seen that the latch 11' is pivoted lower down upon the rib 7 of the end plate than is the keeper 11, so that the operating rod 17 will lie substantially parallel with the axis of the main shaft 4.

The latch 14 which is designed to control the middle doors 10 may roughly be described as being of T-shape. At the point of union between the shank 15 of the latch and the head thereof, the same is pivotally mounted upon the middle spoke 6, the lower extremity of the shank 15 of the latch being pivotally connected with the operating rod 17. The middle doors 10 carry keepers 16, the ends 16' of which are upbent substantially at right angles to the bodies of the keepers, and these portions 16' are bolted or otherwise secured to the middle doors 10. The keepers 16 are disposed substantially normal to the plane of the middle doors 10, the extremity of one of the keepers being upbent and the extremity of the other keeper being downbent, the said bent portions of both of the keepers 16 being adapted to be engaged by the remote ends of the head of the T-shaped latch 14. As shown to best advantage in Fig. 1, the ends of the operating rods 17 are extended through suitable apertures in the adjacent end plate 9, and the ends of these operating rods carry buttons 18. Assembled in any suitable manner with the frame post 2 at one end of the motor

is a block 20, and mounted upon the upper face of this block 20, as shown in Fig. 5, is a toothed segment 23. A lever 21 is fulcrumed intermediate its ends upon the segment 23 and is provided with suitable latch mechanism 22 to engage the teeth of the segment. Shackled to the end of the lever 21 is a tubular conoidal yoke 25. This yoke 25, as shown in Fig. 2, is curved to conform to the arc in which the buttons 18 move when the motor is in operation. The side of the yoke adjacent the end plate 9 is flattened and slotted from end to end to form fingers 26.

Referring to Fig. 1, wherein the doors of the motor are shown in locked position, it will be seen that as the end of the operating rod enters the space between the fingers 26, the button 18 will travel the inner face of said fingers and since the yoke 25 is conoidal in shape, the button 18 in moving toward the smaller end of the yoke will cause the operating rod 17 to move outward, unlocking the doors from the position shown in Fig. 4. By throwing the lever 21 toward the opposite end of the segment from that shown in Fig. 1, the button 18 will be thrown into contact with the outer face of one of the fingers 26, or in other words, into contact with the face of the yoke 25 which is adjacent the water wheel, the yoke 25, by the last named movement of the lever 21, being tilted to position its smaller end nearer to the water wheel than its larger end. When the yoke is thus disposed, the buttons 18, engaging the outer face of one of the fingers 26, will slide the operating rods inward, and lock the doors.

It will be seen that the foregoing mechanism furnishes a simple means whereby the doors of the motor may be moved to an open or closed position at the will of the operator.

In order to stop the rotation of the motor and to hold the doors in an open position, the following mechanism is employed:—

Referring to Fig. 2, it will be seen that a windlass 29 is journaled for rotation upon the grate bars 3 of the motor. This windlass 29 may be operated in any suitable manner and it is designed to receive chains 28 which support the locking bars 27. These locking bars are curved longitudinally to conform to the circumference described by the end of the spoke 6, and one of these locking bars is provided, as shown in Fig. 1, for each end set of the spokes 6. These locking bars are channel-shape in cross section, as shown in Fig. 1, and they are of sufficient length to include between their ends several of the spokes 6.

When it is desired to stop the motor, the windlass 29 is rotated, allowing the locking bars 27 to drop down upon the motor to include between their depending sides the doors 10 in an open position. The locking

bars are then permitted to ride downward upon the periphery of the wheel to a point adjacent the base 1, so that when the doors 6 pass beneath the surface of the water, they will be held open and in a position inoperative to receive the current impulse.

For the support of the yoke 25 a bracket 30 may be provided, one end of which is mounted on the lever 21, the other end being provided with a chain 31, or like element, which is connected with the yoke 25.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent, is:—

1. In a water motor, the combination with a wheel having pivoted doors provided with keepers, of pivoted latch members carried by said motor, and an operating rod pivoted to said latch members and serving to bring the same into and out of engagement with said keepers.

2. In a water motor, the combination with a wheel having pivoted doors provided with keepers, of pivoted latch members carried by said motor, and an operating rod pivoted to said latch members and arranged to be reciprocated to oscillate said latches into and out of engagement with said keepers.

3. In a water motor, the combination with a wheel having pivoted doors provided with keepers, of latch members pivoted to said motor, an operating rod pivoted to one end of said latches, said operating rod being provided at one end with a button, and means arranged to be brought into engagement with said button, whereby said operating rod is reciprocated and the latches oscillated into and out of engagement with said keepers.

4. In a water motor, the combination with a plurality of spokes, of a plurality of doors pivoted to said spokes, a keeper on each of said doors, latch members pivoted to said spokes, and an operating rod pivoted to said latch members, a lever, and means connected to said lever, whereby to reciprocate said operating rod to oscillate said latches into and out of engagement with said keepers.

5. In a water motor, the combination with a wheel having pivoted doors, of a locking bar arranged to be lowered into engagement with the doors to hold the same in open position, the locking bar being arranged to travel downward with the periphery of the wheel beneath the surface of the water; and means for raising and lowering the locking bar.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

BERNARD W. MASTERSON.

Witnesses:

W. R. PACE,
A. LOZER.