No. 676,467. Patented June 18, 1901.

W. L. MORGAN.

WATER MOTOR.

(Application filed June 30, 1900.)

(No Model.)

Fig. 1.

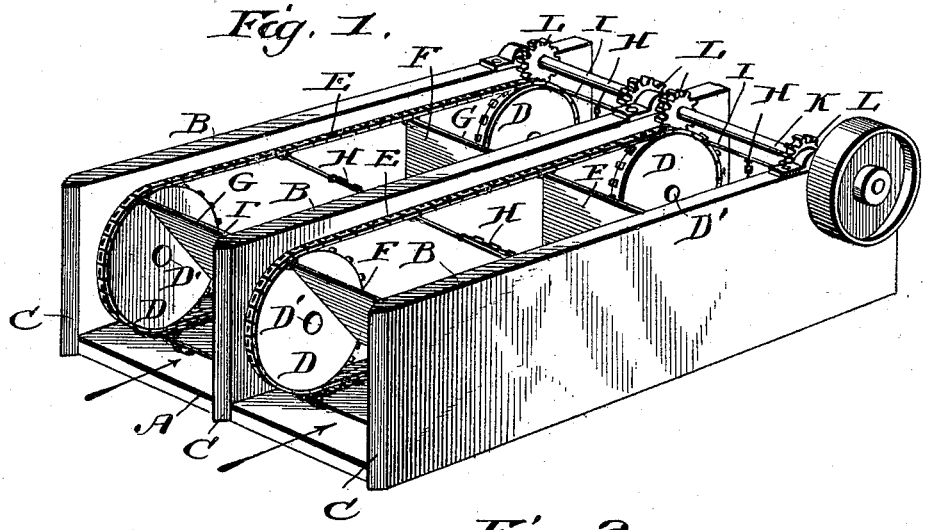


Fig. 2.

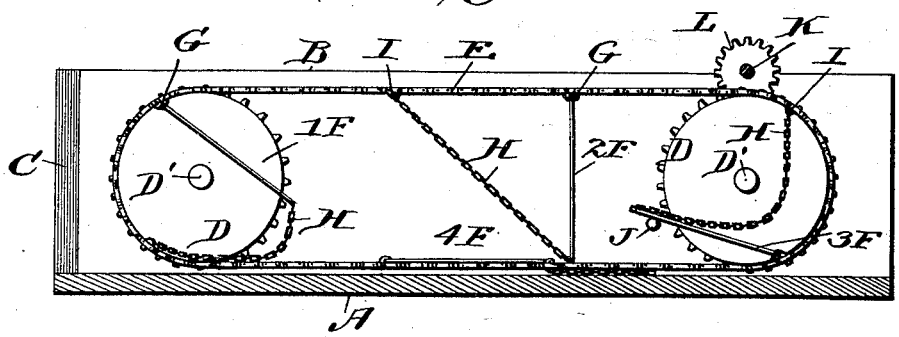
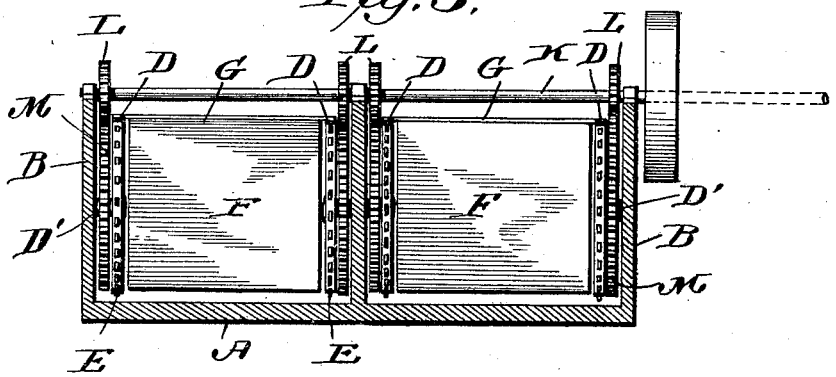


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM L. MORGAN, OF BURLINGTON, IOWA.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 676,467, dated June 18, 1901.

Application filed June 30, 1900. Serial No. 22,153. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. MORGAN, a citizen of the United States, residing at Burlington, in the county of Des Moines and State of Iowa, have invented a new and useful Water-Motor, of which the following is a specification.

This invention relates to improvements in current-motors; and the object is to provide a simple and effective motor to be entirely submerged in a stream for the purpose of utilizing the force of the current of the stream.

With the above object in view the invention consists in the novel features of construction hereinafter fully described, particularly pointed out in the claims, and clearly illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my improved motor; Fig. 2, a vertical longitudinal sectional view of the same, and Fig. 3 is a vertical transverse sectional view taken through the rear pair of chain-disks.

In practice it is designed that a number of the motors shall be used, the same being placed side by side.

The casing of my invention consists of a bottom wall A and side walls B, which latter have their front ends C pointed for the purpose of dividing the current and directing the same to the different motors where more than one is used. Thus an open-ended casing is provided to contain the motor, and this casing is entirely submerged in the stream, it being positioned at a sufficient depth beneath the surface of the stream to permit floating obstacles or ice to pass over the motor without coming in contact therewith and obstructing its operation and also for the purpose of enabling the motor to operate even though the stream should be frozen over.

At the forward and rear ends of the casing the pairs of disks D are journaled to the side walls by means of shafts D′, said disks being arranged directly opposite each other and having no connecting-shaft, so that the space between them is entirely free from any obstruction. These disks are provided about their periphery with cogs to engage in the links of the endless chains E, said chains connecting the disks of the forward pair with those of the pair at the rear end of the casing. A plurality of blades F are pivotally connected at one end to said chains by the transversely-extending rods G, while the opposite or free ends of the blades are connected with the chains by chains H, one end of the chains being attached to the blades and the opposite ends to rods I, connecting chains E. The movement of each swinging blade in one direction is limited by its chain H, as will be readily understood. These blades F are of substantially the same longitudinal extent as the diameter of the chain-disks and are of a width to fill the space between the side walls of the casing.

Projections J are carried by the side walls of the casing in front of the rear pair of disks and adjacent thereto for the purpose presently to be set forth.

I have numbered the blades illustrated by the numerals 1 2 3 4 in addition to the letter F.

The operation of my invention is as follows: The current entering the casing at the forward end thereof, as indicated by arrow, strikes the blade 2^F and moves the lower end of the same until said blade is vertical, the chain H preventing further movement of the blade, as before described. The force of the current against said blade causes the same to move rearwardly, carrying with it the endless chains. When said blade reaches the projections J, it will engage said projections adjacent to its free end, and said end will be retained by said projections, while the pivoted end of the blade will be carried around by the movement of chains, the free end of the blade swinging on said projections as a pivot until the blade assumes the position illustrated by blade 3^F. In this position the current will strike against the under side of the blade and swing the same on its pivot G until said blade lies flat upon the bottom wall of the casing, as illustrated by blade 4^F. The blade will then be moved forwardly until the disks at the forward end of the casing are reached, when said blade will assume the position illustrated by blade 1^F and from this position to operative position, receiving the force of the current and continuing the movement of the chains. The projections J act as a reversing means for the blades at the rear

end of the motor, as will be understood from the above description. It is necessary to provide some mechanism for causing both of the chains to move together; otherwise the blades would not effectively operate. This construction consists of a shaft K, journaled transversely of the casing and at a point above the rear pair of disks, said shaft carrying the cog-wheels L, which mesh with gears M, carried by the shafts of the rear disks. Thus the two disks at the rear of the casing turn together, so that the chains move at the same rate of speed and the blades are prevented from becoming twisted in the casing. Motion may be communicated by the disks to any machinery which it is desired to drive by any preferred arrangement of shafting and gearing, the same not being shown in the drawings.

Should more than one motor be used, the side wall of one casing will be used as a party-wall, as will be understood.

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

1. In a current-motor, the combination with a casing, of pairs of disks mounted at the respective ends of said casing, endless chains connecting the disks of each pair, transversely-arranged blades pivotally connected at one end to said chains, flexible connections between the free ends of said blades and said chains, and reversing means for said blades, substantially as described.

2. A current-motor comprising a casing, pairs of disks mounted in said casing, endless chains connecting the disks of each pair, transversely-arranged blades pivotally connected at one end to said chains, flexible connections between the free ends of said blades and chains, and projections arranged adjacent to one pair of disks and adapted to engage the free ends of the blades, for the purpose of reversing the blades, substantially as described.

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