

No. 880,912.

PATENTED MAR. 3, 1908.

F. J. PAYNE.
CURRENT MOTOR.

APPLICATION FILED FEB. 11, 1907.

3 SHEETS—SHEET 1.

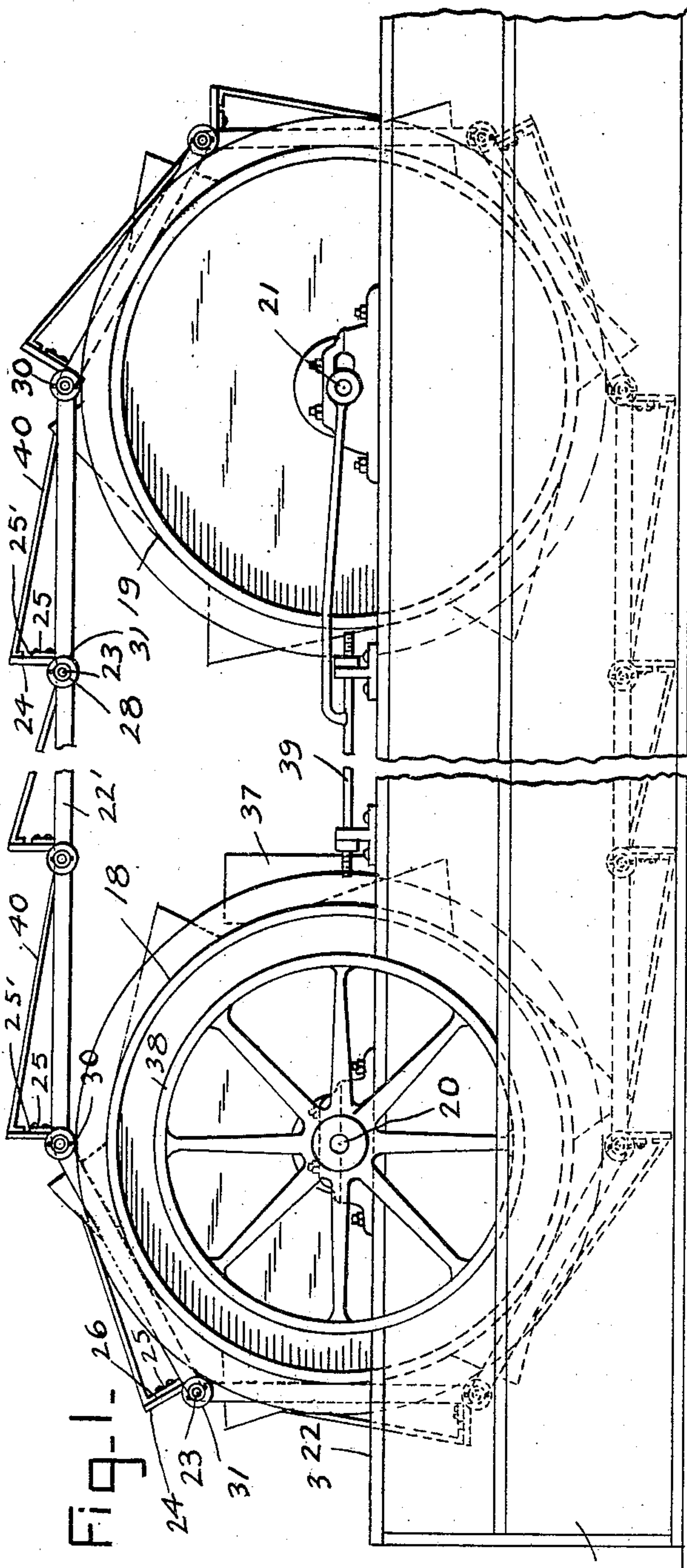
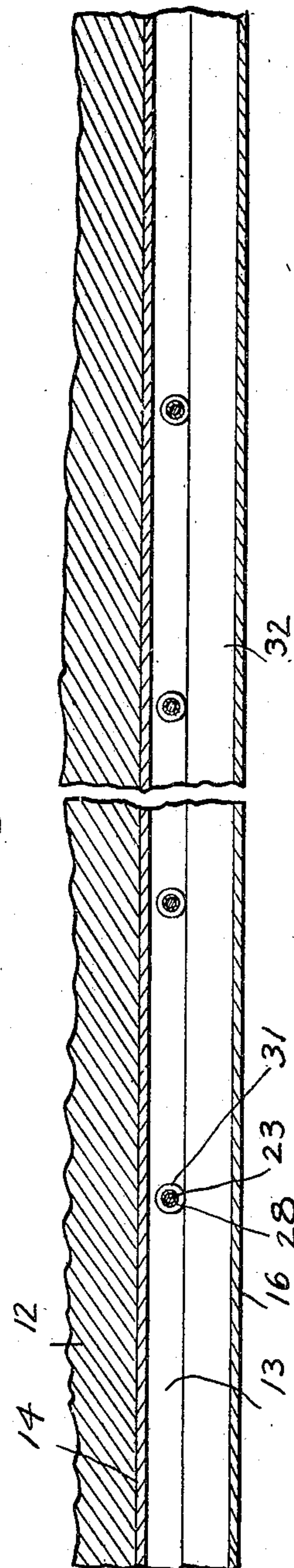


Fig. 4-



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3 SHEETS—SHEET 2.

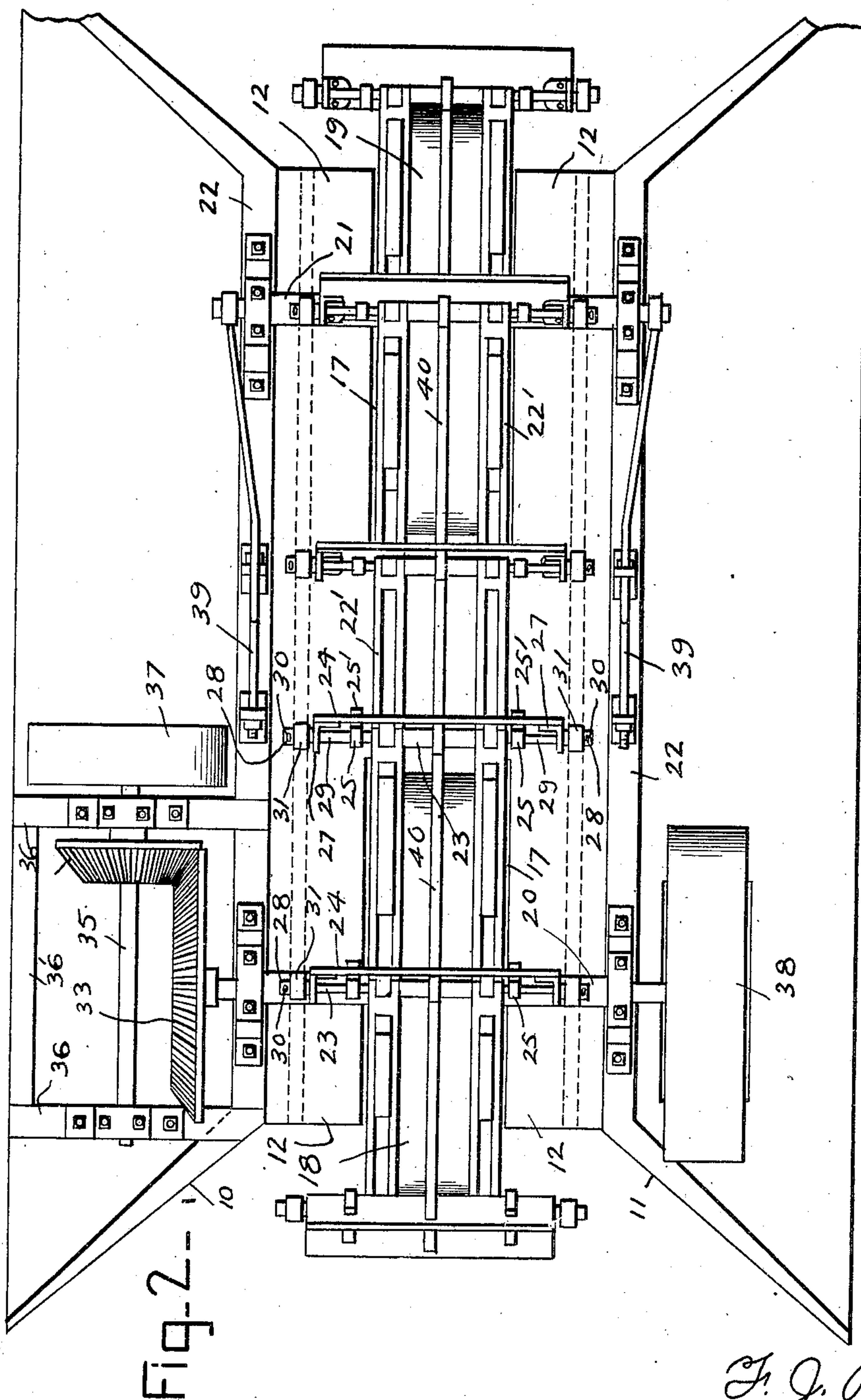


Fig. 2--

Fig. 6--

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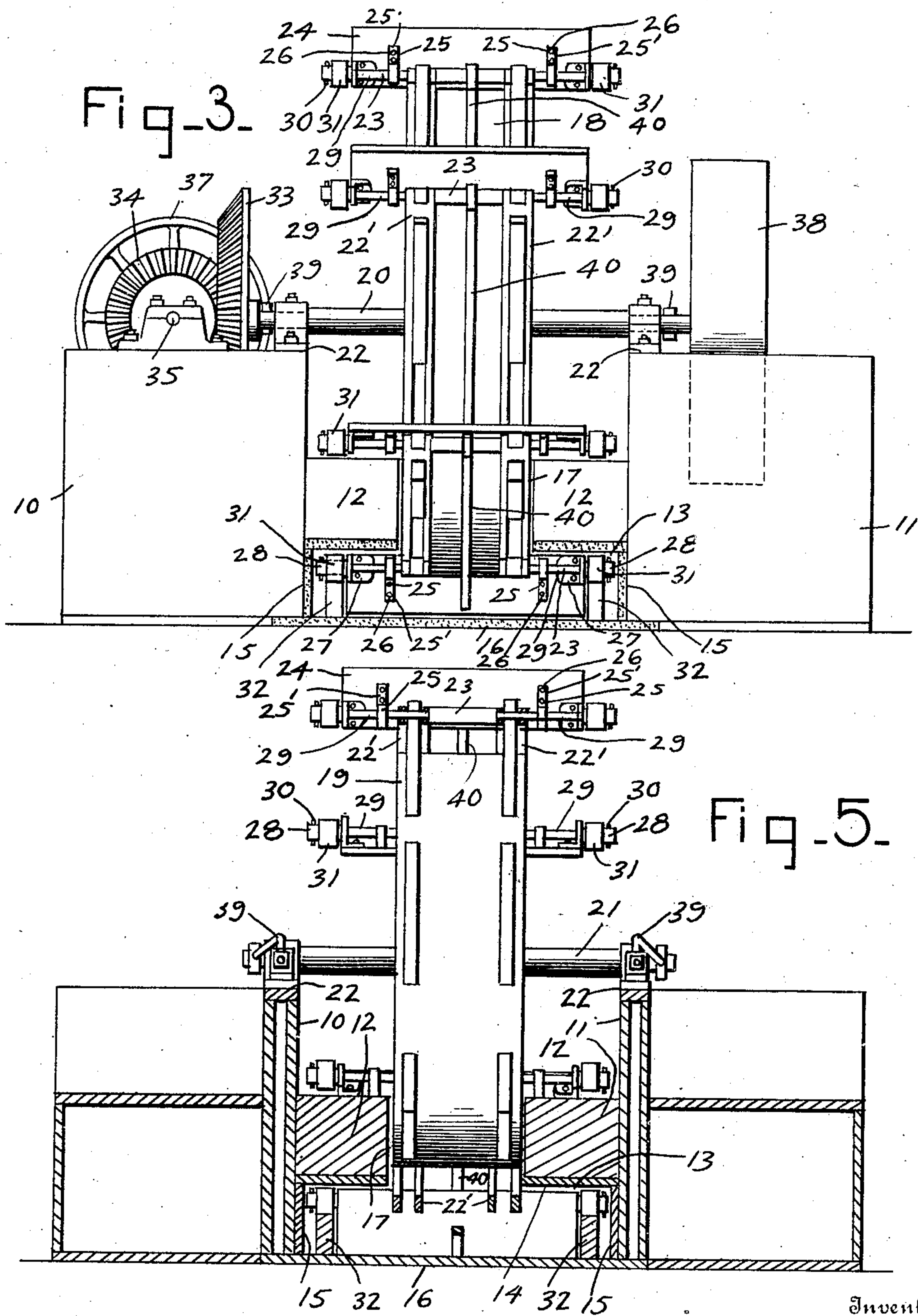


Fig. 5.

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UNITED STATES PATENT OFFICE.

FRANCIS J. PAYNE, OF PORTLAND, OREGON.

CURRENT-MOTOR.

No. 880,912.

Specification of Letters Patent.

Patented March 3, 1908.

Application filed February 11, 1907. Serial No. 356,828.

To all whom it may concern:

Be it known that I, FRANCIS J. PAYNE, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Current-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention has reference to current motors, and it aims to provide a simple, and at the same time highly efficient mechanism of that class for utilizing the current of a body of running water for the generation of power.

Heretofore, where current motors have been made use of in connection with sluice ways, it has been possible to utilize only the momentum of the water, so that the use of a train of gears between the motor shaft and the shaft to be driven therefrom is practically essential to obtain the requisite speed of the latter. By the present invention, however, it is proposed to augment the momentum of the water by closing the sluice to such an extent as to create an increased pressure or "head" directed against the chain paddles as they enter the sluice, so as to carry the same therethrough at an increased rate of speed.

A further object of the invention resides in the provision of a sluice way in which the depth of the water traveling therethrough is at all times equal to the height of the paddles, thus preventing a waste of the current power.

A still further object of the invention consists in the provision of means disposed against the opposite sides of the sluice for supporting the lower stretch of the paddle chains.

With the above and other ends in view, the invention consists in the construction, combination, and arrangement of parts, all as hereinafter fully described, specifically claimed and illustrated in the accompanying drawings, in which like parts are designated by corresponding reference numerals in the several views.

Of the said drawings—Figure 1 is a side elevation of the improved current motor. Fig. 2 is a top plan view thereof. Fig. 3 is an end view. Fig. 4 is a longitudinal section through the sluice way showing the dis-

position of one of the tracks thereon. Fig. 5 is a transverse section therethrough. Fig. 6 is a perspective view of one of the plates for supporting the paddles.

Referring more particularly to the drawings, reference numerals 10 and 11 designate a pair of walls formed of masonry or wood, as desired, and disposed in spaced relation to each other in the bed of the stream. These walls are connected by a section 12 of similar material, so arranged as to form the top or roof of a sluice way 13, which latter is further provided with an upper facing 14, side facings 15, and a bottom 16, preferably of cement. The walls 10 and 11 are flared outwardly at opposite ends so as to form a converging mouth-piece or intake, and the wall 12 is provided at opposite ends with longitudinal slots 17, into which a pair of sprocket wheels 18 and 19 extend, said wheels being mounted upon shafts 20 and 21 journaled in bearings disposed upon the upper face of the uprights 22 which form an extension of the walls 10 and 11. The sprocket wheels above referred to are connected by a pair of endless chains or conveyers 22', the corresponding links of which are connected by a series of transversely disposed shafts 23, each of which carries a paddle blade 24, secured thereto by straps 25 disposed at opposite ends of each shaft and including a depending section 25', which extends across the face of the corresponding paddle and is fastened thereto by bolts 26. The paddles are further secured at each end to the inwardly-directed rear arm of the L-shaped end plate 27, whose forwardly-projecting arm is provided with an outwardly extending sleeve 28, formed integrally therewithin. The reduced ends 29 of the shafts fitting in said sleeves and projecting therebeyond. The sleeves are, in turn, secured to the shaft ends by spring catches 30 which are passed through registering openings formed in the sleeve and shaft ends.

The opposite ends of each shaft are further provided with wheels 31, which are loosely mounted on the sleeves 28 and run on tracks 32 disposed within the sluice way adjacent the side walls 15 thereof, so that during the passage of the chains and paddles therethrough the latter will be prevented from sagging and contacting against the bottom wall of the sluice way.

As shown in Figs. 3 and 5, the distance between the chains 22' is equal to approxi-

5 mately half the distance between the side
 walls 15 of the sluice way, while the paddles
 themselves are approximately equal in size
 to the cross sectional area of the sluice way,
 10 so that during their passage therethrough
 the full force of the current is directed there-
 against, thus preventing any loss of power.
 It will be likewise apparent from the same
 figures that owing to the disposition of the
 15 sluice way beneath the connecting wall 12,
 a slight head of water will be constantly
 maintained at the intake to the sluice way,
 resulting in an increased momentum or pro-
 pelling force of the current, which is aug-
 20 mented by the flared formation of the intake.

The shaft 20 of the front wheel 18, as
 shown in Fig. 3, extends at opposite ends
 beyond its uprights 22, and is provided at
 one end with a beveled pinion 33, in mesh
 25 with a similar pinion 34 mounted on a shaft
 35 journaled in bearings disposed upon the
 cross beams 36, which connect the uprights
 22 with the uprights 36', formed at the outer
 edge of the wall 10. The shaft 35 of the
 30 pinion 34 carries a belt pulley 37, through
 which power is transmitted by a belt (not
 shown) to the shaft to be driven. The oppo-
 site end of shaft 20 may, if desired, be li-
 e- wise provided with a pulley 38. The bear-
 35 ings in which the shaft 21 is journaled are
 preferably movable, and the wheel 19 carried
 thereby may thus be moved towards or from
 the wheel 18 to loosen or tighten chains 22',
 this adjustment being effected through the
 40 threaded shaft or rod 39 connected therewith
 and provided with an actuating means of any
 desired type.

As shown in Fig. 1, the paddle blades are
 at all times disposed at right angles to their
 40 corresponding links, and to this end their
 upper ends are connected by braces 40 of the
 succeeding shaft.

From the foregoing it will be understood
 that the ordinary momentum or force of the
 current will be augmented both by the for- 45
 mation of the flared intake and by the dis-
 position of the sluice way beneath the con-
 necting wall 12, the latter construction re-
 sulting in the maintenance of a slight head
 of water at all times at the intake, which, as 50
 is obvious, will increase the current force
 which thus drives the wheels at a greater rate
 of speed. It will be likewise apparent that
 the sluice way and the chains may have any
 desired length. It is to be further noted that 55
 by the formation of a closed sluice way no
 water will run over the tops of the blades or
 paddles, as is the case where an open sluice
 way is used, so that there will be no appre-
 ciable loss of power.

What is claimed, is—

The combination, in a current motor, of a
 closed sluice way; a pair of wheels disposed
 at opposite ends thereof; endless chains 65
 adapted to travel over said wheels and
 through the sluice way; transversely-dis-
 posed shafts connecting said chains; L-
 shaped plates secured to the opposite end of
 each shaft, each of said plates having an out-
 wardly-projecting sleeve formed upon its 70
 forward arm through which the correspond-
 ing shaft end extends; a wheel loosely
 mounted upon the sleeve of each plate; and
 tracks disposed within the sluice way, said
 wheels being adapted to travel upon the 75
 tracks to support the paddles during their
 passage through the sluice way.

In testimony whereof, I affix my signature,
 in presence of two witnesses.

FRANCIS J. PAYNE.

Witnesses:

WILLIAM WALTER,
 L. H. OSTERHOUS.