

No. 684,288.

Patented Oct. 8, 1901.

J. D. MURRAY & J. BUCHANAN.
HYDRAULIC MOTOR.

(Application filed Feb. 18, 1901.)

(No Model.)

Fig. 1.

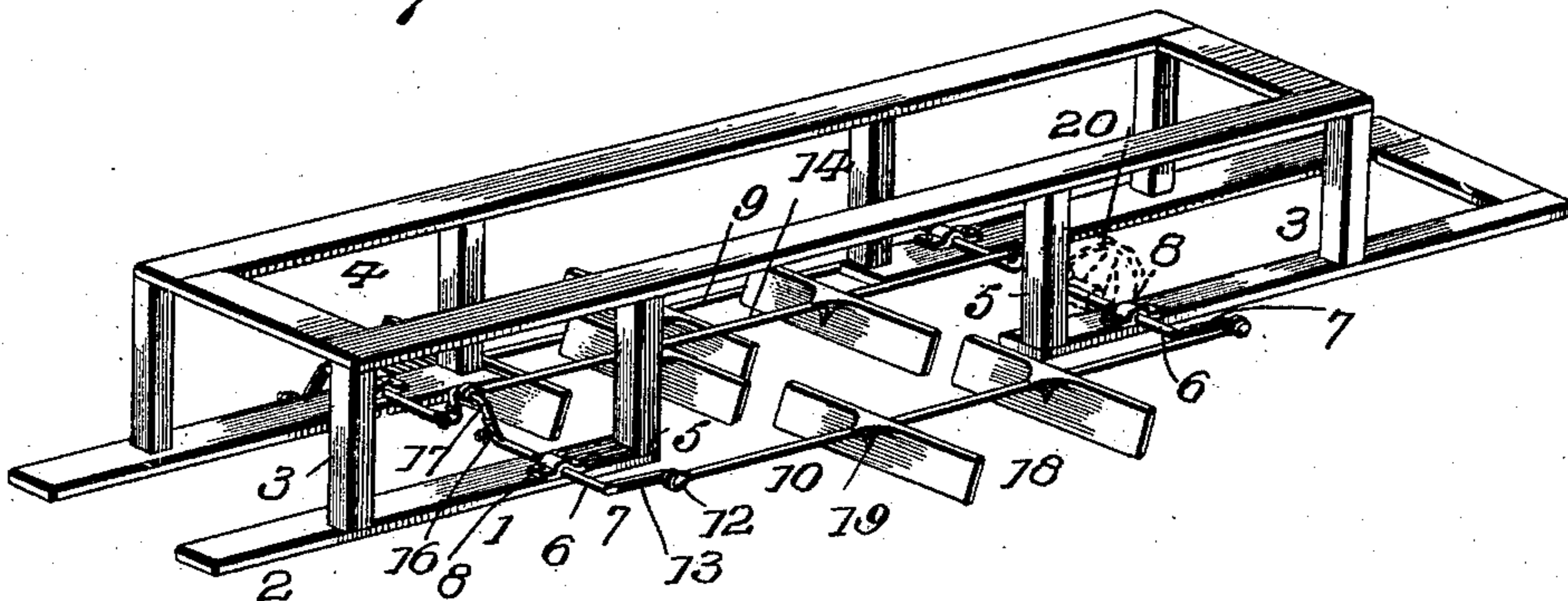


Fig. 2.

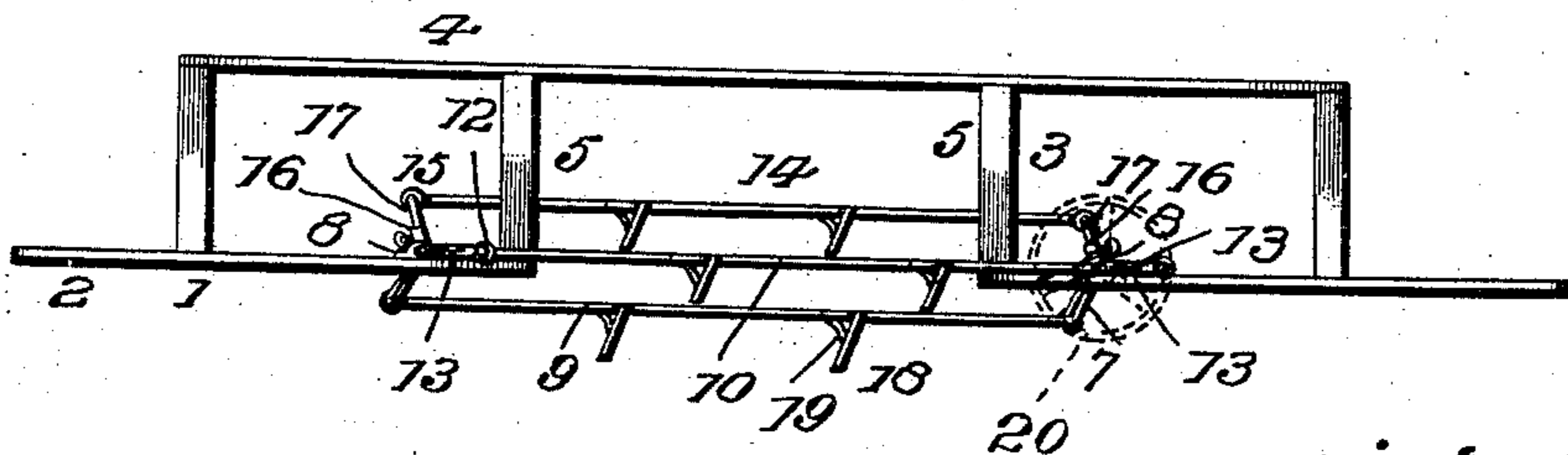


Fig. 3.

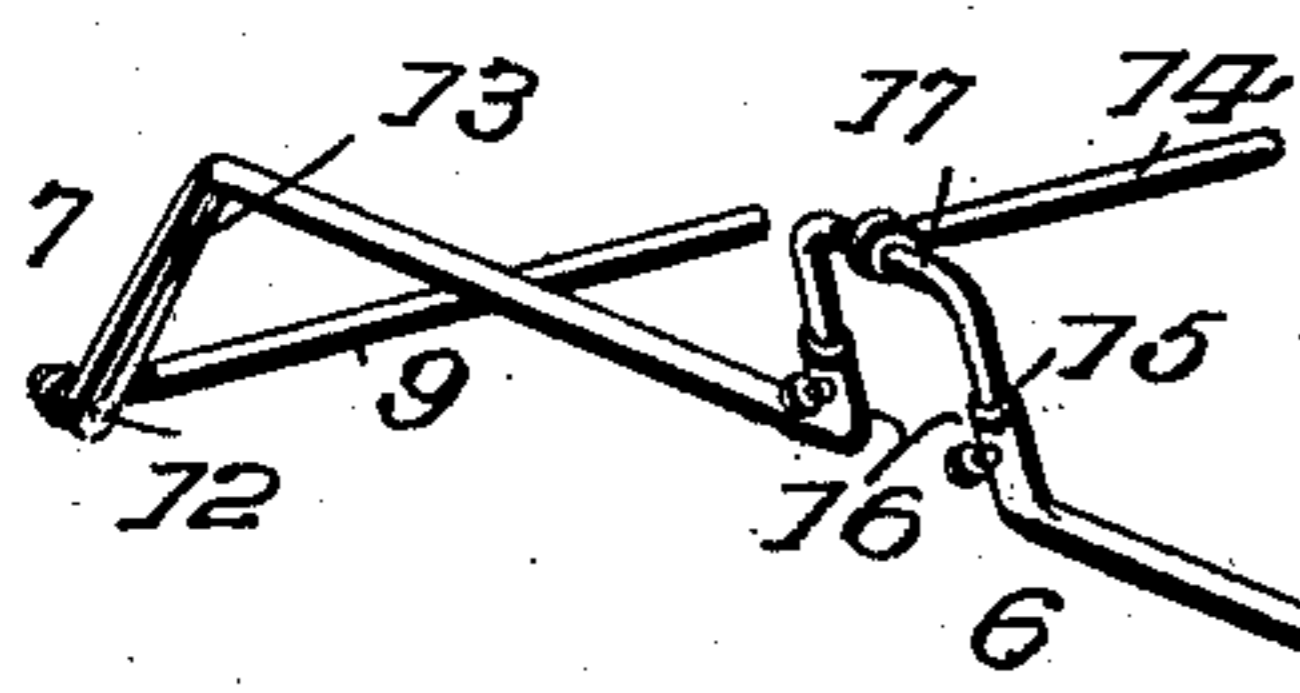
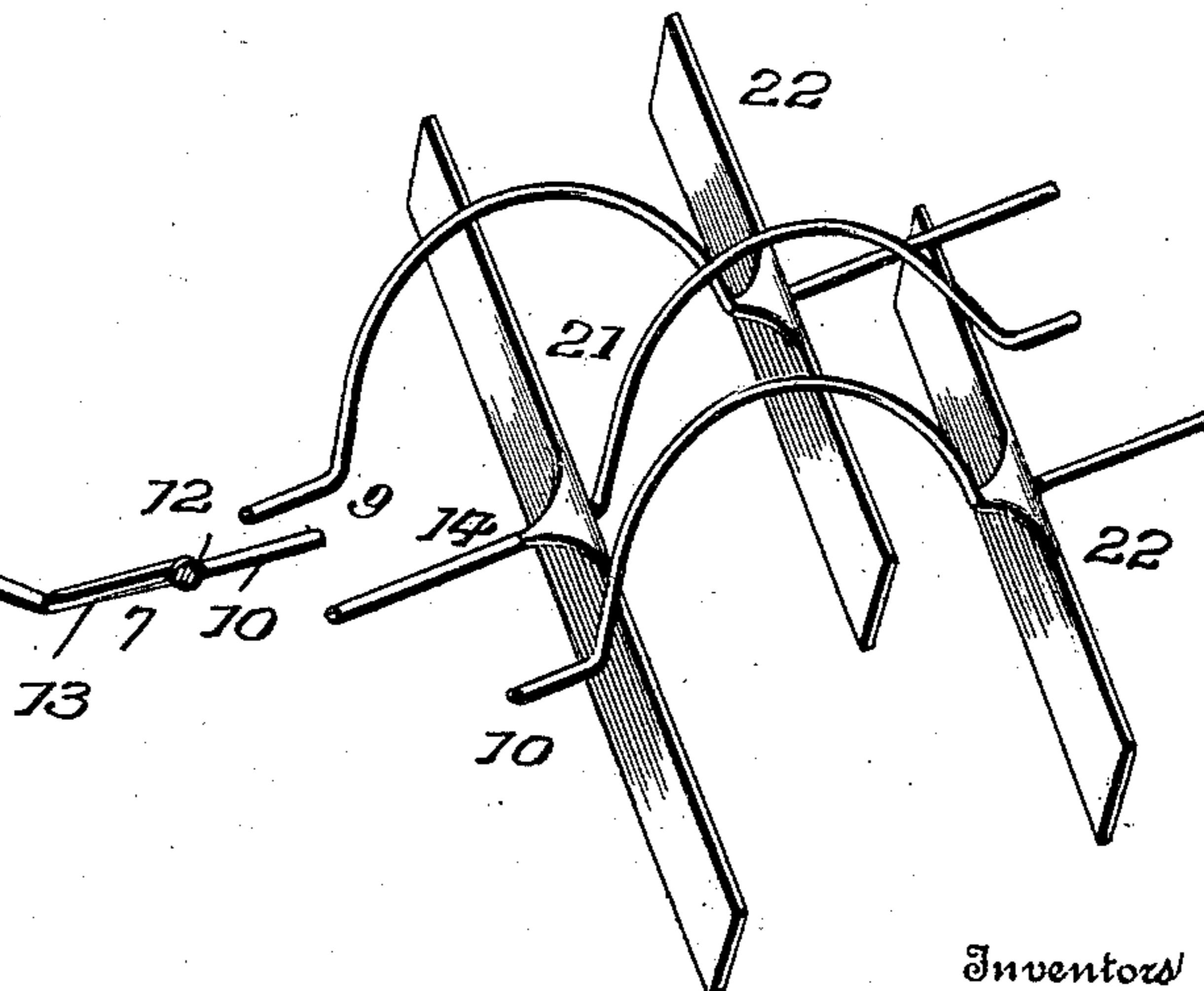


Fig. 4.



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JOHN D. MURRAY AND JAMES BUCHANAN, OF NEWCASTLE, COLORADO.

HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 684,288, dated October 8, 1901.

Application filed February 18, 1901. Serial No. 47,848. (No model.)

To all whom it may concern:

Be it known that we, JOHN D. MURRAY and JAMES BUCHANAN, of Newcastle, in the county of Garfield and State of Colorado, have invented certain new and useful Improvements in Hydraulic Motors; and we 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.

This invention contemplates certain new and useful improvements in hydraulic motors.

The object of the invention is to provide improved, simple, and highly-efficient means for utilizing the power of a stream of water to operate a pump or other machinery.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective. Fig. 2 is a side elevation. Fig. 3 is a view of one of the crank-shafts. Fig. 4 is a modification.

Referring to the drawings, 1 designates a frame on which the shafts are carried. The form shown comprises flat side bars 2, provided with posts 3, upon which is mounted a rectangular top frame 4. Between posts 5 side bars 2 are broken away to provide space for the movement of the paddles. This frame can be placed on any float adapted to the stream on which it is used.

6 designates a pair of crank-shafts having each a double crank at its center and a single crank 7 at each end. These crank-shafts are mounted in boxes 8, secured to side bars 2. The opposite single cranks 7 at the ends of the shafts are connected by rods 9 and 10, said rods being provided with bolts 12, which are adjustable in slots 13, formed in the cranks. The double cranks are connected by a rod 14, the extended end of which may be coupled to a pump or other machine. The parallel portions 15 of the double cranks are each formed in two parts 16 and 17, the part 17 being designed to be held within the tubular part 16. The object of these connections between the rods and the cranks is to permit of regulating the depth to which the paddles are immersed, according to the stream in which the motor is used.

18 designates a series of paddles secured by means of braces 19 to the connecting-rods 9, 10, and 14. If desired, a pulley 20 may be placed on one of the crank-shafts between the single and double crank to transmit motion to any machinery.

The cranks are set at an angle of about one hundred and twenty degrees from each other, so as to avoid a dead-center and to insure a greater power being derived, since one set of paddles is always receiving the full force of the stream. We have found that by attaching the paddles to the connecting-rods a greater efficiency is attained than when the paddles are connected directly to the crank-shafts. In the latter construction there is a loss of power by reason of the fact that the paddle itself revolving around the shaft will when first submerged be slanted or at an angle to the surface of the water and will consequently offer resistance to submersion; but when the paddles are fast on the connecting-rods they always maintain the same position relative to the latter and are held at one angle, causing them to enter the water edgewise. Consequently at all points in their movement while submerged they receive the full force of the current against their entire surface. It will be noted that the paddles are immersed to a depth corresponding to the length of the cranks and that such length may be increased or lessened, according to the current in the stream.

In Fig. 4 we have shown another form of embodiment in which the connecting-rods are curved upwardly. Rod 14 is provided with a long paddle 21, and rods 9 and 10 have shorter paddles 22. In operation paddle 21 revolves in a circle underneath rods 9 and 10, and the latter revolve around each other beneath rod 14. This construction we have found to possess advantage when the motor is used in small shallow streams. The length of paddle 21 may be made the same as the width of the stream, so as to receive the full force of the latter. The connections of the curved connecting-rods to the cranks are the same as those before described.

We claim as our invention—

1. A hydraulic motor comprising a frame, crank-shafts extended transversely of said frame, having each a double crank in its cen-

ter and a single crank at each end, said double crank having an extensible and contractible section and means for locking the same, and said end cranks having slots, the several
5 cranks of each shaft being set at different angles, rods connecting the single cranks of one shaft to those of the other shaft, bolts for fastening such rods to the slotted portions of such cranks, a rod connecting said double
10 cranks, and paddles on said connecting-rods, as set forth.

2. A hydraulic motor comprising a frame, crank-shafts mounted on said frame, curved

rods connecting the several cranks, and paddles depending from said rods, one of said 15 paddles being of greater length than the others, as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

JOHN D. MURRAY.
JAMES BUCHANAN.

Witnesses:

JOSEPH T. CAMPBELL,
K. G. MORLEY.