

(No Model.)

A. BAIN.
HYDRAULIC MOTOR OR REVERSING GEAR.

No. 577,342.

Patented Feb. 16, 1897.

Fig. 1.

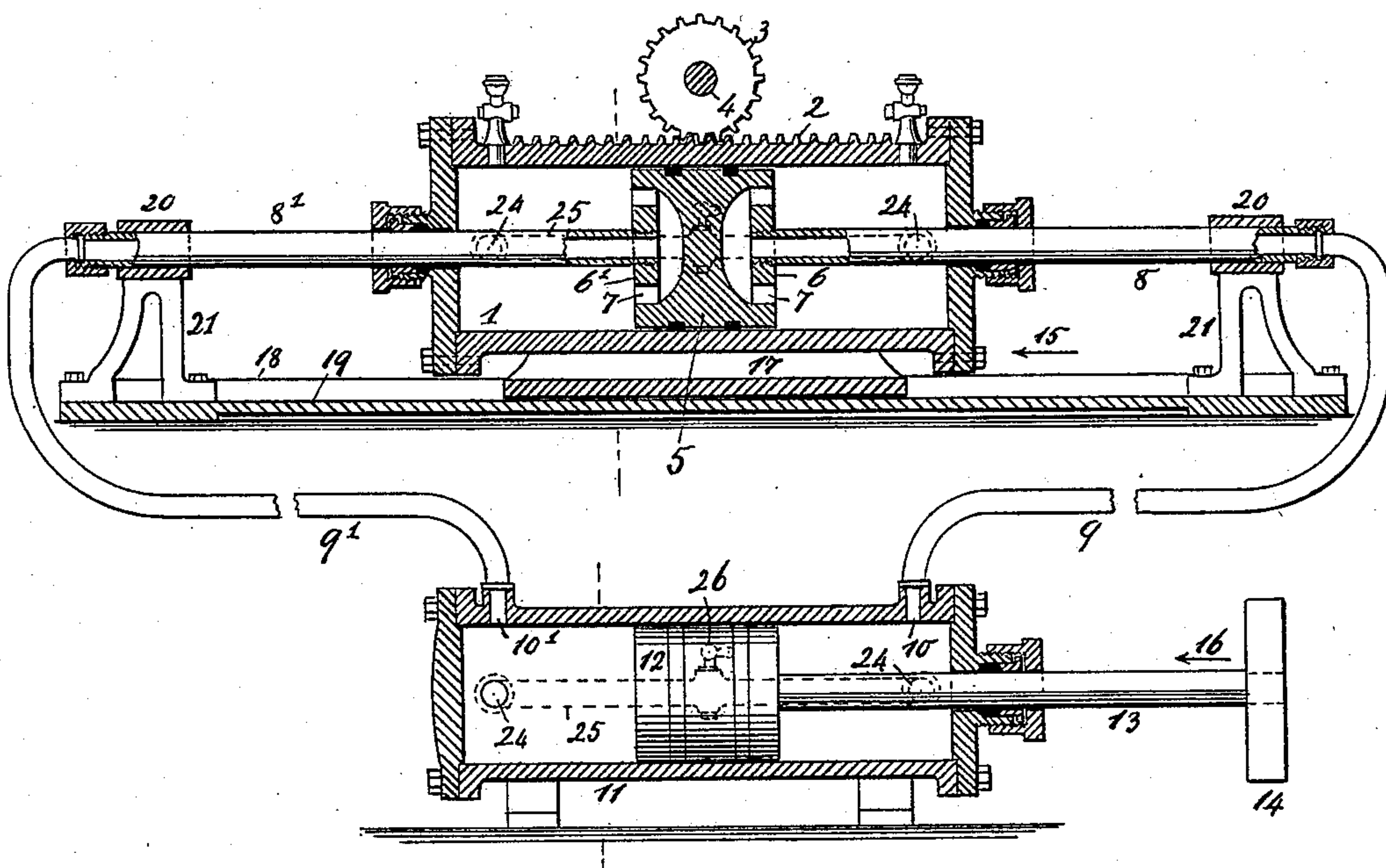


Fig. 2.

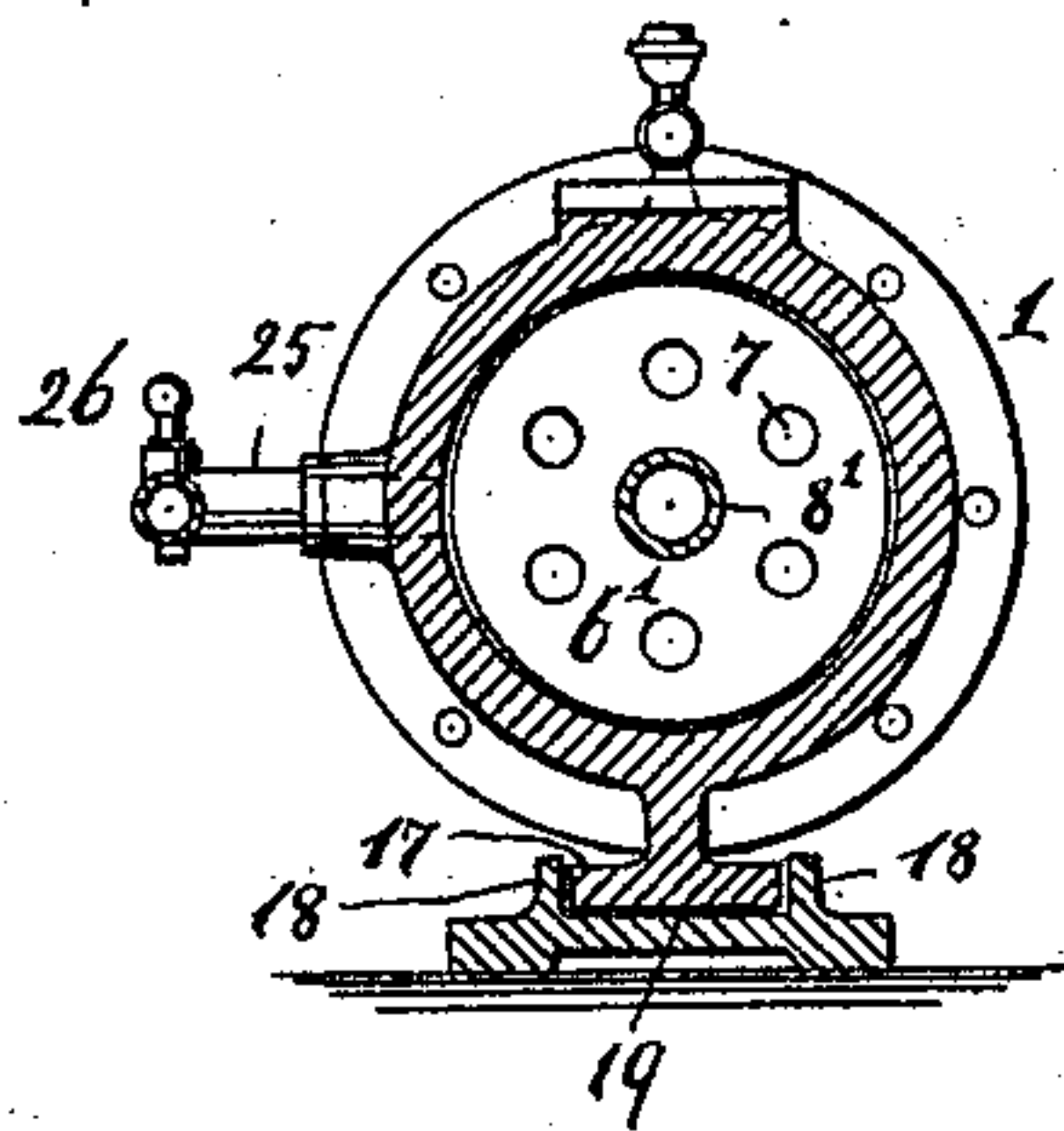
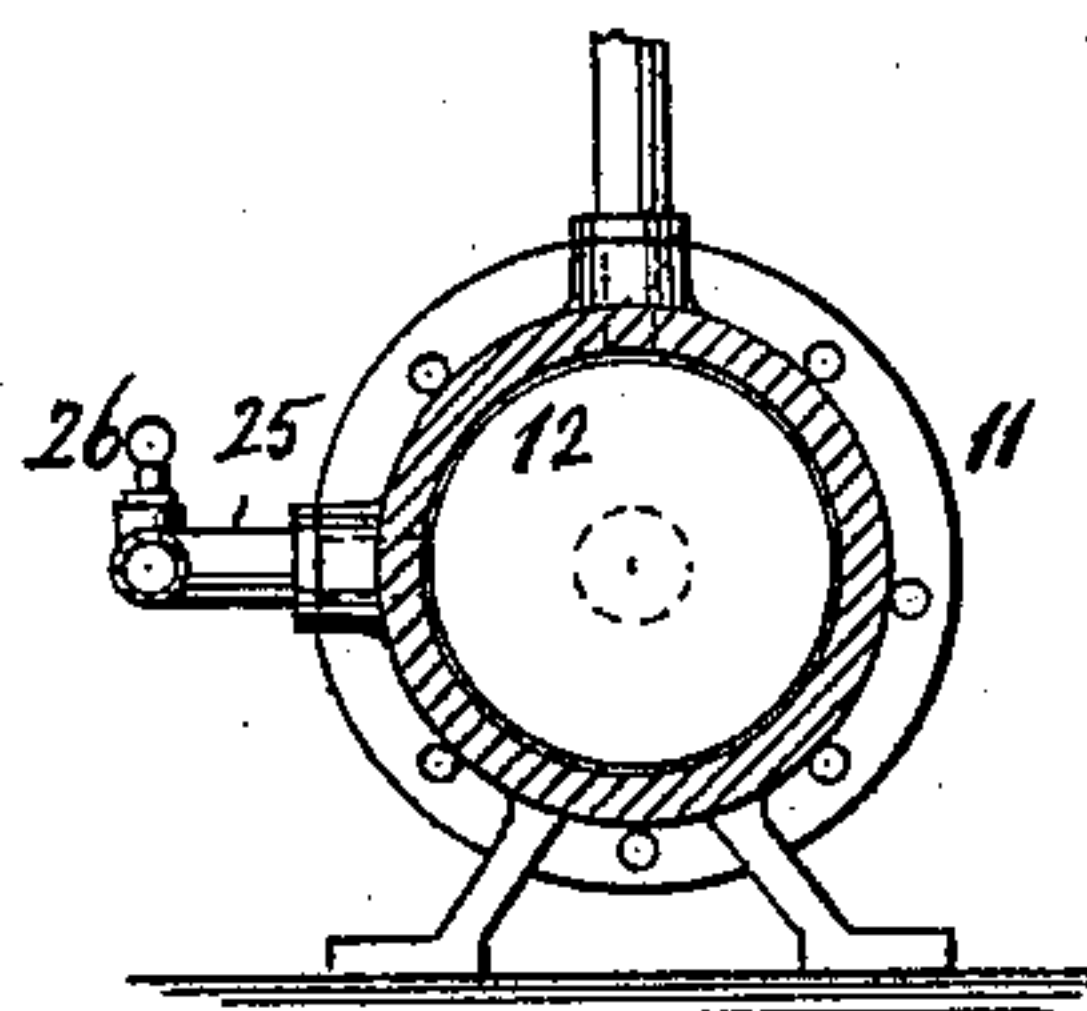


Fig. 3.



WITNESSES:

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ALEXANDER BAIN, OF NEWARK, NEW JERSEY.

HYDRAULIC MOTOR OR REVERSING-GEAR.

SPECIFICATION forming part of Letters Patent No. 577,342, dated February 16, 1897.

Application filed February 20, 1896. Serial No. 580,089. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER BAIN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Hydraulic Motors or Reversing-Gears, of which the following is a specification.

The object of this invention is to provide a hydraulic motor of simple construction comprising two cylinders, one of which is capable of reciprocating the piston of the other so as to effect reversing movements, as set forth in the following specification and claim and illustrated in the annexed drawings, in which—

Figure 1 is a sectional elevation of reversing-gear. Fig. 2 is a sectional view of the primary cylinder. Fig. 3 is a sectional view of the secondary cylinder.

The device comprises a primary cylinder 1 and a secondary cylinder 11. Each cylinder has a piston 5 and 12 and ports located on opposite sides of the pistons. The ports at cylinder 1 are formed by the hollow piston-rods 8 and 8'. The interiors of these hollow piston-rods communicate with the interior of cylinder 1 by channels or communications 7, formed in or through the faces or portions 6 and 6' of the piston 5. These piston-rods 8 and 8' communicate, respectively, with the ports 10 and 10' of cylinder 11 by means of tubes or conduits 9 and 9'. As liquid or pressure is forced out of cylinder 1 at one side or another of piston 5 the resultant pressure in cylinder 11 will cause piston 12 to reciprocate or move back and forth.

In the drawings the cylinder 1 is shown movable, having a rack 2, which on rotation of gear-wheel 3 on shaft 4 in one direction or another will cause the cylinder 1 to move or slide. If the cylinder 1 is moved in the direction of arrow 15, the resultant pressure through port 8 and conduit or communication 9 will move piston 12 with rod 13 in the di-

rection of arrow 16. A reverse movement of cylinder 1 will cause a reverse movement of piston-rod 13. The reciprocations of rod 13 can be made to work a reversing-gear or steam-engine valves or a cross-head 14 or can be utilized in any suitable way.

The piston 5 remains fixed when the cylinder 1 reciprocates. The cylinder 1 has its foot 17 made to slide or travel and to be guided by the guide or flanges 18 on track or way 19. The tubular rods 8 and 8' are held by the collars 20 on brackets 21, and jam-nuts can be applied as known about or against collars 20 to clamp the ports 8 and 8'.

The cylinders 1 and 11 have the equalizing or oppositely-located ports 24, connected by pipes 25, having cocks 26. The cocks 26 being opened and the pistons 5 and 12 being brought to central position in their cylinders the liquid or pressure in such cylinders will be properly distributed therein, after which the cocks 26 are closed.

What I claim as new, and desire to secure by Letters Patent, is—

A movable cylinder having a piston with recessed or concave faces, perforated faces allowing communication from the cylinder to the recesses, and hollow piston-rods made to communicate through said faces with the recesses, combined with a fixed cylinder having a piston and ports located at opposite sides of the fixed cylinder-piston and made to communicate with the hollow piston-rods, said fixed cylinder having an equalizing-pipe and equalizing-ports located on opposite sides of its piston, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALEXANDER BAIN.

Witnesses:

WM. C. HAUFF,
E. F. KASTENHUBER.