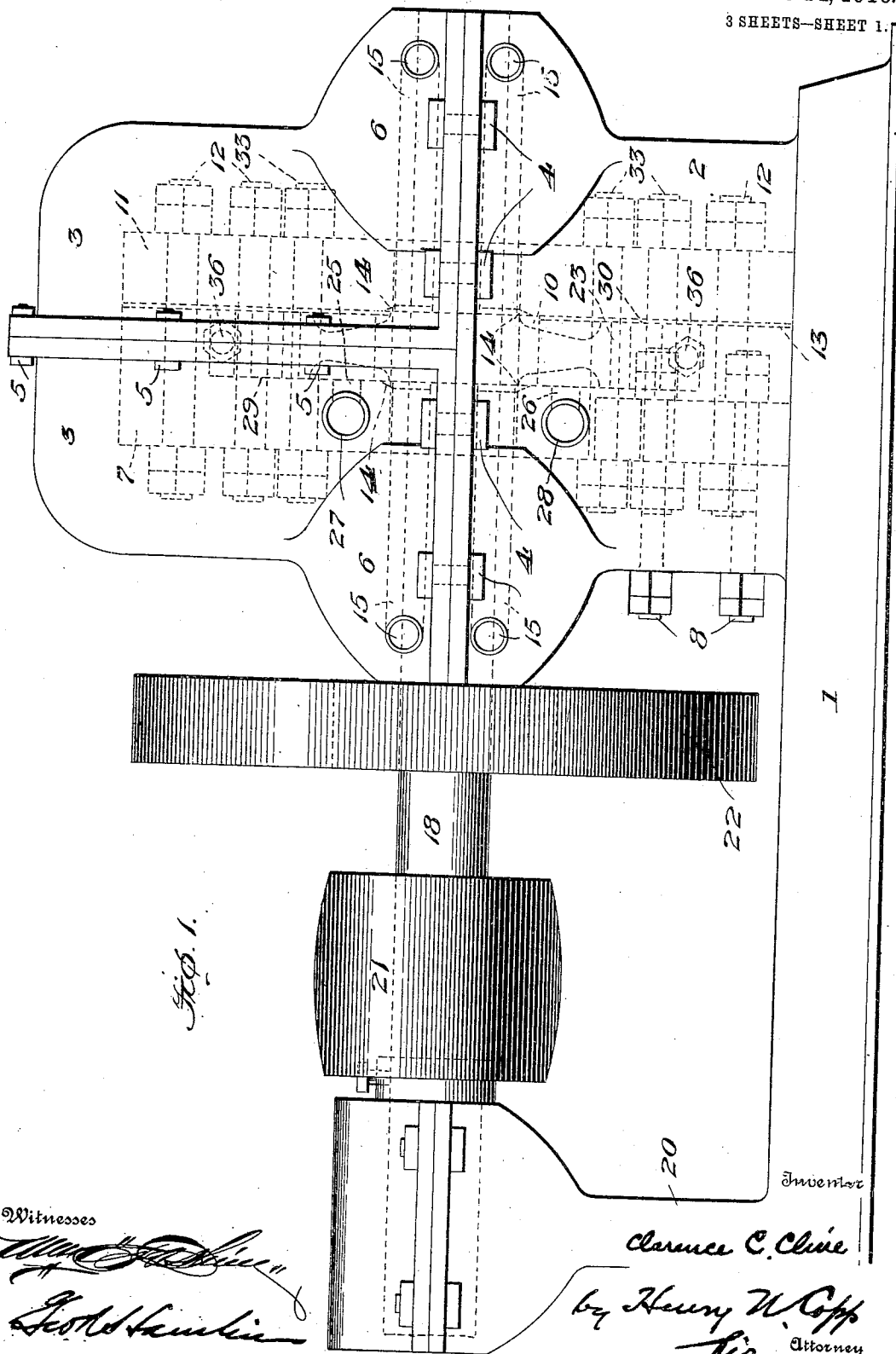


961,209.

C. C. CLINE.
FLUID JET MOTOR.
APPLICATION FILED APR. 29, 1909.

Patented June 14, 1910.

3 SHEETS—SHEET 1.



Witnesses

George Hamilton

Inventor

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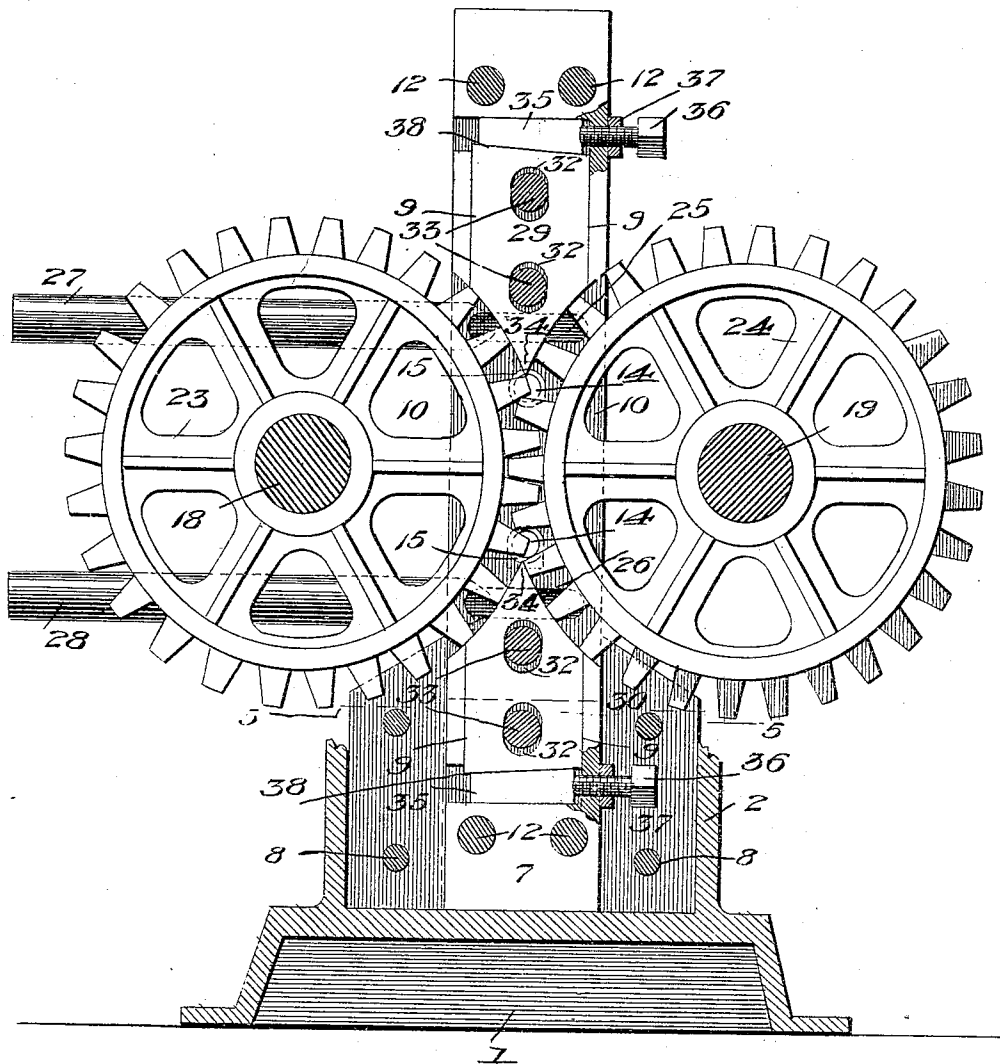
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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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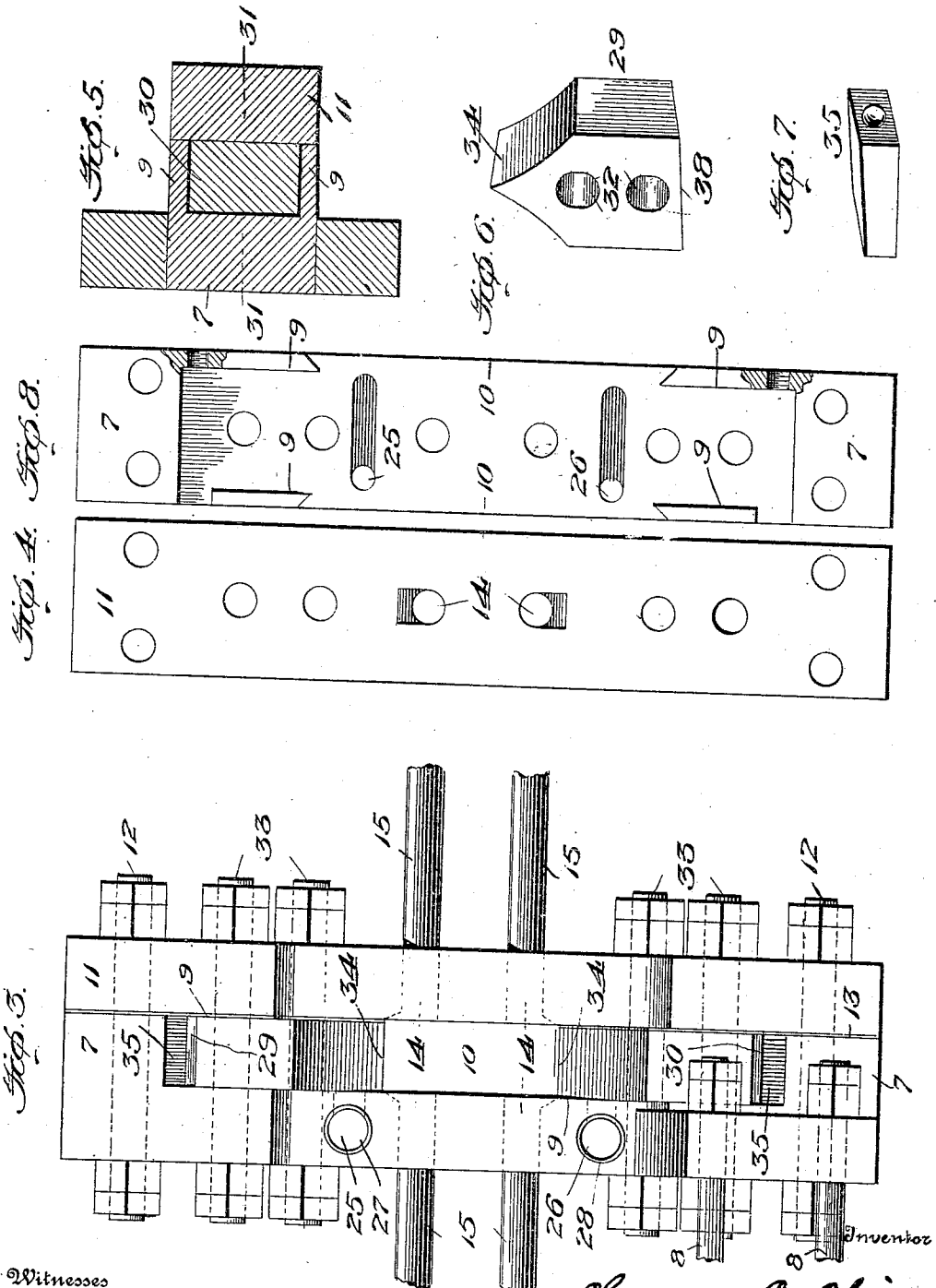
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961,209.

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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

CLARENCE C. CLINE, OF OAKLAND, CALIFORNIA.

FLUID-JET MOTOR.

961,209.

Specification of Letters Patent. Patented June 14, 1910.

Application filed April 29, 1909. Serial No. 492,824.

To all whom it may concern:

Be it known that I, CLARENCE C. CLINE, a citizen of the United States, residing at Oakland, county of Alameda, and State of California, have invented certain new and useful Improvements in Fluid-Jet Motors, of which the following is a specification.

My invention relates to fluid jet motors.

The object of the present invention is the provision of a fluid jet motor of simple and durable construction, capable of variable power and speed, wherein no dead centers will exist, having a novel arrangement of intermeshing gears constituting the revoluble piston, associated with a novel arrangement of ports, whereby the rotary pistons may be turned in either direction, controlled as to speed and power, and friction of the gears upon each other neutralized, and novel means for regulating the ports whereby the rate of rotation of the pistons is controlled.

The invention embodies certain novel instrumentalities and combinations which appear more fully hereinafter and are recited in the appended claims.

In the accompanying drawings:—Figure 1 is a side elevation; Fig. 2, a cross-section taken at right angles to Fig. 1, showing the intermeshing gears which constitute the pistons; Fig. 3, an enlarged side view with the outer case and the piston removed; Fig. 4, an inner face view of a part of the piston casing, showing the ports; Fig. 5, a section on line 5—5 of Fig. 2; Fig. 6, an enlarged detail of one of the cut-offs; Fig. 7, a similar view of one of the wedges for operating the cut-off; Fig. 8, a face view of the center casing showing the channels in which the slides are positioned.

The motor has a base 1 from which rises a casing or outer shell which is formed in three parts, a lower part 2 integral with the base, and twin upper shell sections 3 which are secured to the upper edge of the base section 2 by bolts 4 and are secured together by bolts 5, the whole constituting a fluid tight casing, which is, however, provided with bearings 6 for the respective shafts. The joints between the parts of the casing or shell may be suitably packed, if desired.

Rising within the shell or case is the center frame 7, which is securely bolted to the casing by the bolts 8 so that it is rigidly held, said center casing being provided with a channel 9 in its face and with openings 10 in its side.

The center casing is completed by the provision of a removable plate 11 secured thereto by bolts 12 and made tight by packing 13. The main portion 7 of the center casing has intake ports 14 connected by pipes 15 leading through the outer shell or casing to any suitable source of motive fluid pressure supply, such as steam, water, gas, or the like, which intakes may be controlled by any suitable throttle valves. The inner faces or mouths of the ports 14 are flared so as to direct the motive fluid in an outward direction in relation to the casing in order that the best possible effect on the rotary pistons may be obtained as will appear hereafter.

The plate 11 has intake ports similar to those described and located just opposite them, said ports being supplied by pipes 15 leading from a suitable source of motive fluid pressure supply. There is thus provided a split or balanced intake.

Carried by suitable shafts 18 and 19 mounted in suitable bearings, such as 20, Fig. 1, either or both of said shafts being provided with a belt pulley 21 and a fly-wheel 22, are intermeshing gear pistons 23 and 24 which are of a width to snugly, yet easily, fit the openings 10, packing being provided if desired. The line of centers of these gear pistons strikes between the upper and lower sets of intake ports, and consequently, if the motive fluid pressure is admitted through the upper ports, the intermeshing gear pistons will turn in one direction, and if admitted through the lower ports, said pistons will turn in the opposite direction, whereby there is provided means for rapidly reversing the motor.

The motive fluid strikes against the teeth of the intermeshing gear pistons and causes the aforesaid rotation, and on account of having the intake ports located on opposite sides of the pistons, the two streams or jets of motive fluid after striking the teeth of the gear pistons and rotating the latter, merge and pass from the casing through exhaust ports 25 or 26 as the case may be, and out through exhaust pipes 27 or 28, the ports 25 and 26 being in the form of channels in the inner grooved face of the center casing 7, thus affording means for the escape of all of the pressure. The provision of the opposite or supply intakes neutralizes the friction on the gear pistons occasioned by the striking of the fluid pressure thereagainst, thus insuring even wear on the shaft bearings and

correct centering and tight packing of the gear pistons.

In order to regulate the speed and power, as well as to provide for the direction of the motive fluid to the ports 25 and 26 after it has acted on the teeth of the gear pistons, there are provided slides 29 and 30 which move in guide channels 9 in the inner face of the casing 7. These slides are provided with elongated slots 32 through which pass bolts 33, which also pass through the casing 7 and plate 11 and firmly hold these slides in position. The slides are provided with pointed ends 34, the respective parts of which are curved in the arc of a circle and are adapted to be disposed as closely adjacent to the extremity of the teeth of the gear pistons as may be desired, according to whatever rate of rotation of the gear pistons is required, the ends of these slides overlapping, more or less, the channel ports 25 and 26 and performing the two-fold function of directing the exhausting motive fluid to said channel ports and more or less covering or uncovering said channel ports and thus more or less restraining the exhaust of the motive fluid, and consequently, regulating the speed of rotation of the gear pistons.

A convenient means for positioning the slides and holding them where positioned, consists of wedges 35 which are urged by screws 36, having check nuts 37, against the inclined faces 38 of said slides.

In operating the motor, steam or air will be usually found most advantageous as the motive fluid, but the motor may be operated hydraulically or as a gas motor.

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

1. In a motive fluid operated motor, the combination with rotary pistons having intermeshing vanes, of a casing in which the intermeshing vanes turn, means for directing opposing jets of the motive fluid to the intermeshing parts of said pistons in a general transverse direction thereto, whereby friction on the pistons is neutralized, and an exhaust controlling valve movably mounted on the casing in position to regulate the exhaust at a point beyond the intermeshing vanes.

2. In a motive fluid operated motor, the combination with rotary pistons having intermeshing vanes, of a casing in which the intermeshing vanes turn, means for directing opposing jets of the motive fluid to the intermeshing parts of said pistons in a general transverse direction thereto, whereby friction on the pistons is neutralized, a port

in the casing for exhausting the motive fluid after it has acted on said pistons, and a valve movably mounted on said casing and having a pointed end located between the said pistons just beyond the intermeshing vanes which is adapted to more or less uncover the exhaust means aforesaid.

3. In a motive fluid operated motor, the combination with a casing, of rotary pistons whose centers of rotation are fixed in relation to said casing and which have intermeshing vanes, the intermeshed parts of said pistons being received in the casing, means for directing opposite jets of motive fluid to the casing in a general transverse direction to said pistons at their points of intermeshing on opposite sides of their centers of rotation, whereby friction on the pistons is neutralized and they are made adaptable for rotation in either direction, said casing being provided with ports on opposite sides of the centers of rotation of said pistons adapted for exhausting the motive fluid after it has acted on said pistons, and valves movably mounted on said casing on opposite sides of the centers of rotation of said pistons adapted to more or less uncover the respective exhaust ports aforesaid.

4. In a motive fluid operated motor, the combination with a casing, of rotary pistons whose centers of rotation are fixed in relation to said casing and which have intermeshing vanes, the intermeshed vanes being received in the casing, means for directing opposing jets of motive fluid to the casing in a general transverse direction to said pistons at their points of intermeshing on opposite sides of their centers of rotation, whereby friction on the pistons is neutralized and they are made adaptable for rotation in either direction, said casing being provided with exhaust ports on opposite sides of the centers of rotation of said pistons and located beyond the intermeshing parts thereof, valves slidably mounted on the casing and provided with pointed ends having curved edges corresponding to the peripheries of the pistons just beyond their intermeshing vanes which are adapted to more or less uncover the exhaust ports aforesaid, and means for independently adjusting said valves to cause them to more or less uncover the exhaust ports.

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

CLARENCE C. CLINE.

Witnesses:

M. ASHLEY,
RUTH A. HILSCHER.