

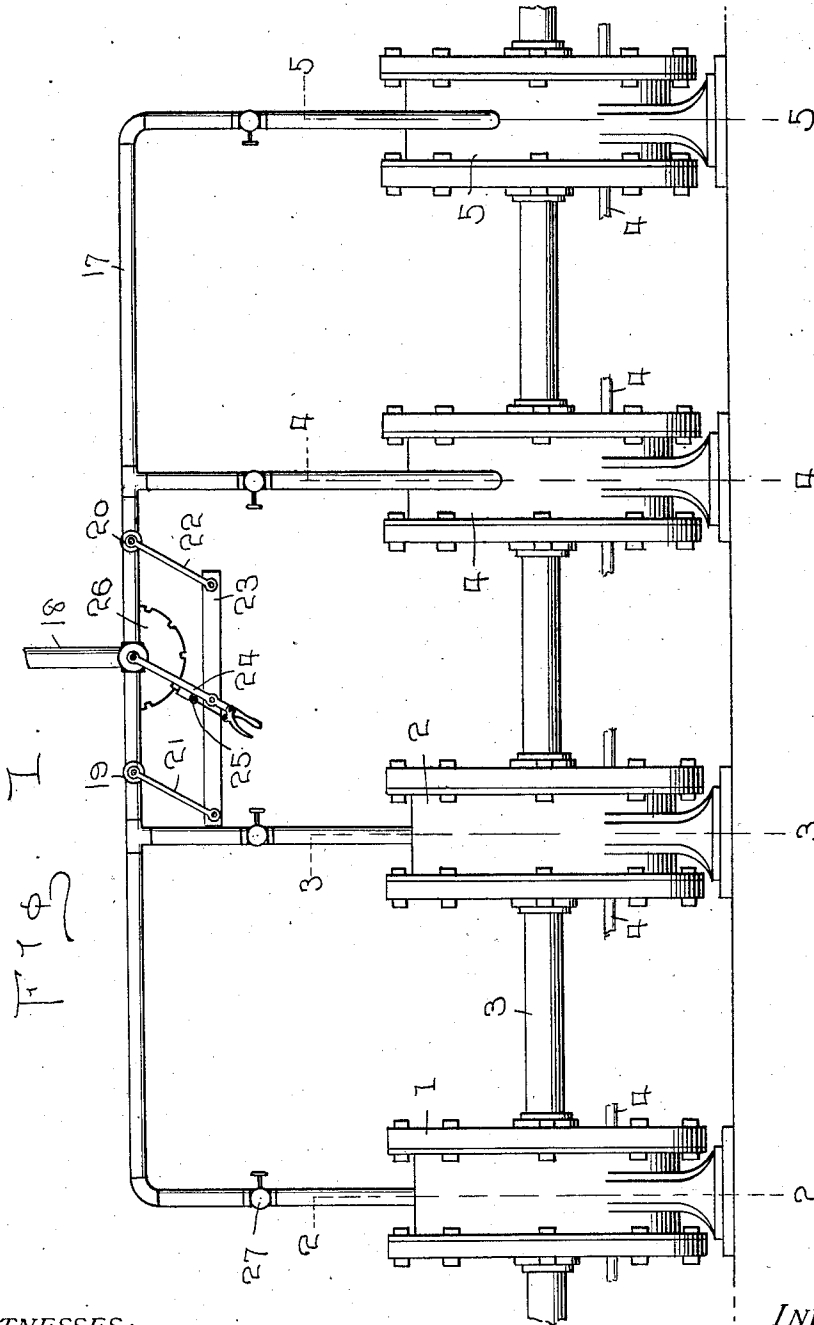
J. F. THOMAS.
MOTOR.

APPLICATION FILED MAY 29, 1911.

Patented Mar. 26, 1912.

3 SHEETS-SHEET 1.

1,021,562.



WITNESSES:

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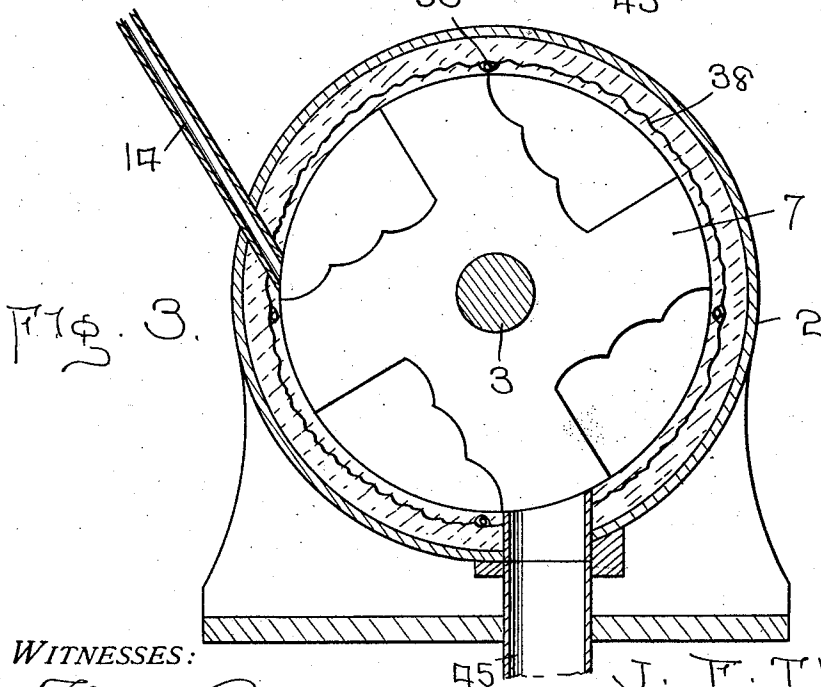
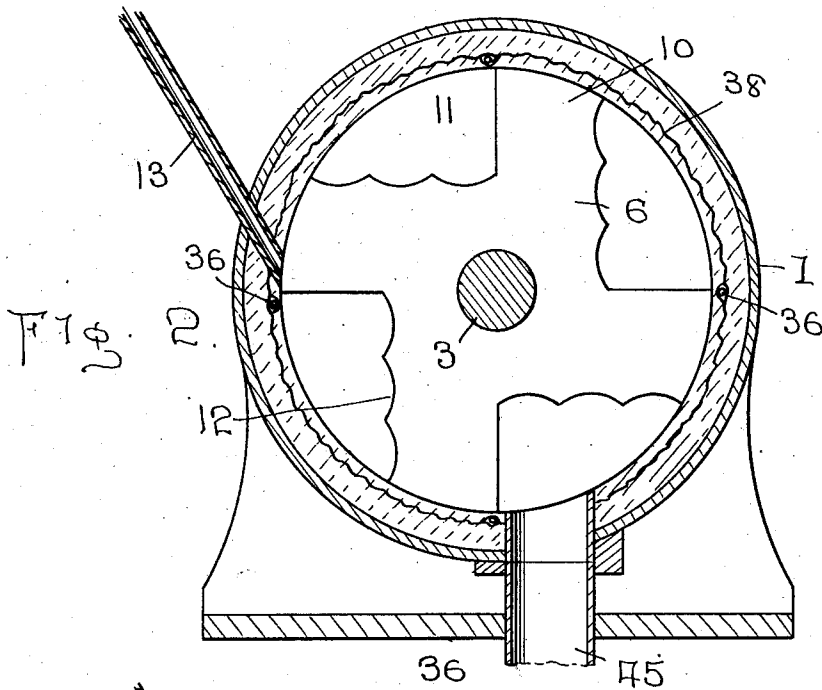
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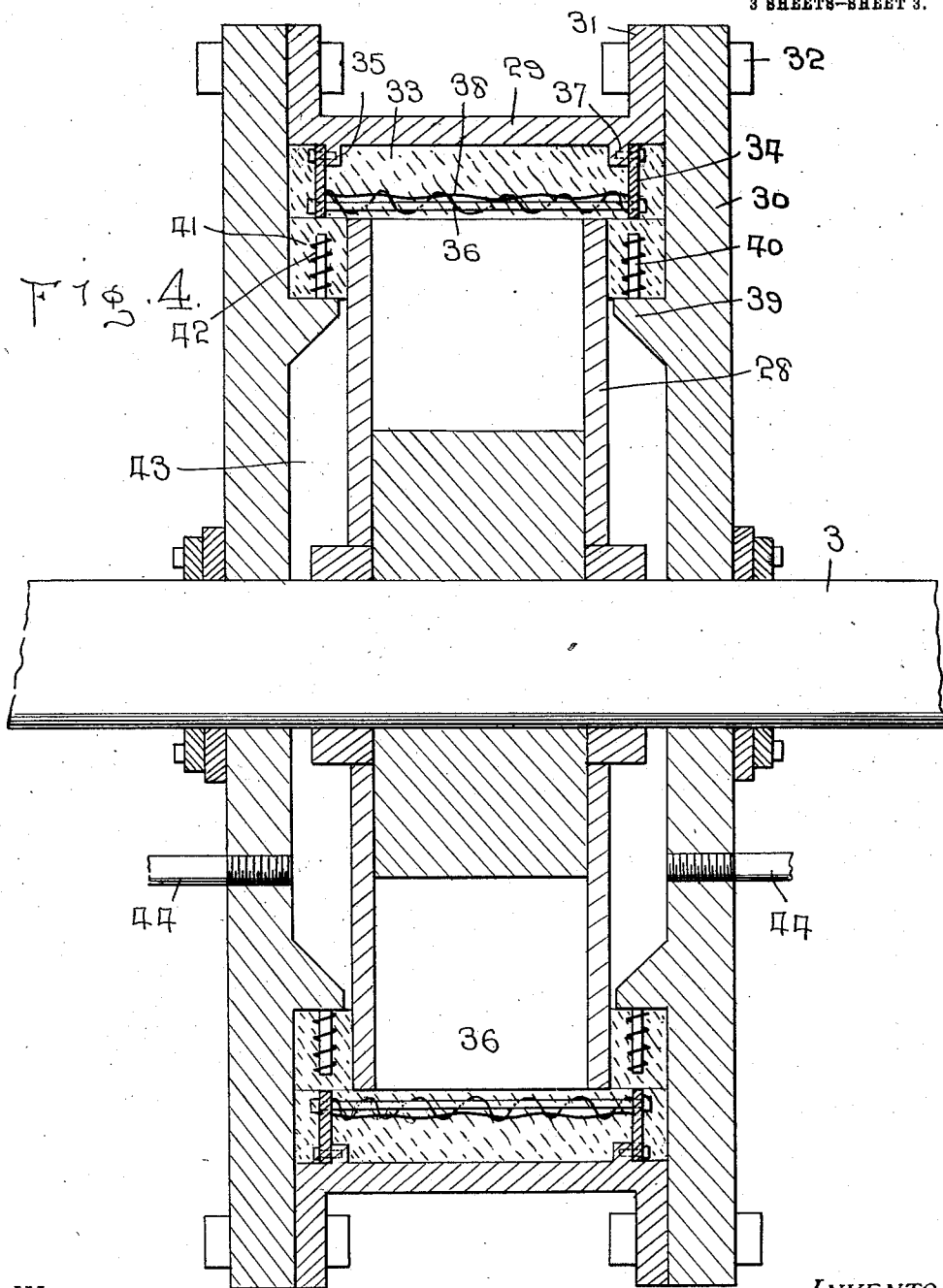
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UNITED STATES PATENT OFFICE.

JAMES FRANCES THOMAS, OF MONTREAL, QUEBEC, CANADA.

MOTOR.

1,021,562.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed May 29, 1911. Serial No. 630,044.

To all whom it may concern:

Be it known that I, JAMES FRANCES THOMAS, a subject of the King of England, residing at Montreal, Canada, have invented certain new and useful Improvements in 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.

My invention relates to new and useful improvements in motor casings and my object is to provide rotary pistons within the motors for driving the shaft to which the pistons are secured.

A further object is to arrange the motors preferably in pairs and so construct the pistons that when the propelling medium is cut off from one of the pistons the piston of the other motor of the pair will be positioned to receive the propelling medium.

A further object is to so construct a portion of the pistons that the rotation of the shaft may be reversed when desired.

A further object is to provide curved faces or pockets on the pistons to receive the propelling medium.

A further object is to provide means for employing certain of the pistons as fly wheels, while the other pistons are used for propelling purposes.

A further object is to provide means for controlling the propelling medium, and, a further object is to provide suitable packing for the pistons.

Other objects and advantages will be hereinafter set forth and pointed out in the specification and claims.

In the accompanying drawings which are made a part of this application, Figure 1 is an elevation of two sets of motors, one set of which is to give a positive drive and the other set a reverse drive. Figs. 2 and 3 are sectional views as seen on lines 2—2 and 3—3, respectively, of Fig. 1. Fig. 4 is an enlarged vertical sectional view through one of the motors.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 and 2 indicate a pair of motors arranged for giving a positive drive to the shaft 3, while 4 and 5 are motors employed for giving a reverse motion to the shaft.

Within each pair of motor casings are pistons 6 and 7, respectively, said pistons be-

ing so arranged that when the propelling medium is cut off by the piston 6, as shown in Fig. 2, the piston 7 will be in position to receive the force of the propelling medium entering the motor 2, while one of the pistons of the other set of motors will be likewise arranged to receive the force of the propelling medium and the other is positioned to cut off the supply of the propelling medium, thereby providing a continuous drive for the pistons.

Each piston is preferably provided with four arms 10, which arms are preferably arranged at a tangent to the shaft 3 and between the arms are arranged pockets 11 to receive the propelling medium. The faces of the arms directly contacted with or receiving the force of the propelling medium are preferably provided with depressions 12, so as to partially confine the force of the propelling medium against the face of the arm having the depressions therein. By this construction it will be seen that when the propelling medium first enters the pocket, it comes directly in contact with the first depression on the face of the arm and is thus materially localized at this point and, as the arm rotates, the contact point of the propelling medium with the arm gradually travels toward the axis of the cylinder and thus consecutively engages the depressions from the outer to the inner end of the arm.

The propelling medium is entered into the motors 1, 2, 4 and 5, through the feed pipes 13, 14, 15 and 16, respectively, which enter the casings of the motors at a tangent to the axis of the motors, the upper ends of said feed pipes being connected with a supply pipe 17, which is in turn connected to any suitable device for containing the propelling medium through a connecting pipe 18, which encounters the supply pipe substantially at its longitudinal center.

The supply pipe 17 is supplied with a pair of valves 19 and 20, which are positioned on opposite sides of the point of connection between the connecting pipe and the supply pipe, said valve being so arranged that when one is opened the other is closed. The upper ends of the valves are provided with stems 21 and 22, which are connected together by means of a link 23 so that said valves will be controlled in unison, the link being attached at its longitudinal center to a lever 24, the inner end of which is pivoted to the supply pipe 17. The lever 24 is provided with

the usual or any preferred form of latch 25, which engages notches in a rack 26 to hold the lever and the valves controlled thereby in their adjusted positions.

- 5 By providing a number of notches in the rack, the supply of propelling medium may be increased or decreased, as may be desired, or by moving the lever 24 to the radial center of the rack, the supply of propelling
10 medium will be cut off from both sets of motors.

As best shown in Figs. 2 and 3, the arms of the pistons are so arranged that when the supply of propelling medium is cut off by
15 one of the arms, the corresponding arm of the other piston has moved to a position to admit the propelling medium, this being also the case with the pistons of the other motors, so that a constant flow of the pro-
20 pelling medium is passing into one or the other of the pairs of motors, thus giving a continuous and steady drive to the pistons and eliminating any jar or vibration, such as is encountered by other forms of motors.
25 Instead, however, of using the motors in duplicate, they may be used singly and to this end stop cocks 27 are placed in the length of the feed pipes for the various motors, and by closing the cock in one of the
30 feed pipes, the propelling medium will be fed to but one motor. The various pistons are located between plates 28, which plates are positioned within the casing of the motor, each casing comprising a circular band
35 29 and side plates 30, the band having flanges 31 to which the side plates are secured, by means of bolts 32 or in any suitable manner. The plates 28 are of less diameter than the interior of the band 29 and
40 the space between the band and plates is filled with a packing 33, which packing is entered within the band while in a plastic state and is held in position by means of rings 34, the outer edges of the rings resting
45 against shoulders 35, formed on the band 29, while the inner edges thereof are connected together by means of bolts 36. If desired, the rings may also be bolted to the shoulders by entering stud bolts 37 through
50 the outer edges of the rings and into the shoulders 35 of the band. The packing within the ring is reinforced by placing wire 38, preferably woven together in the form of gauze, between the two rings 34, said
55 wire being preferably secured in any suitable manner to the bolts 36, the wire and the major portion of the rings being embedded within the packing.

The section of packing 33 is molded
60 within the band before the piston and side plates are introduced to position, and in order to form a packing for the peripheral edge faces of the plates 28, the side plates 30 are provided with inwardly projecting
65 ledges 39, from which project pins 40 and on

said ledges are placed sections of packing 41, similar to the packing 33, the pins 40 being embedded in said packing.

The strips of packing 41 are caused to adhere to the section of packing 33 by placing
70 a coating of the packing, while in a plastic state, between the meeting edges of the two sections of the packing, so that when the packing has become properly hardened it will be in one continuous section. The sections of packing 41 are further reinforced
75 by strips of wire 42, which is also preferably woven similarly to the wire 38, and said sections 42 are attached to the pins 40 in any suitable manner for supporting the same
80 while the plastic material is being placed therearound. By applying this form of packing in the manner shown, a substantially perfect seal is formed around the pistons, but should any of the propelling medium
85 pass between the packing and the plates 28, it will enter the cavities 43 between the plates 28 and 30 and escape therefrom through ports 44.

Each of the motors is provided with a
90 suitable exhaust port 45, through which the propelling medium escapes from the motor. The propelling medium for this motor may consist of steam, water, compressed air, or
95 explosive gases and when the gases are used any suitable form of explosion tank may be provided and the force of the explosion directed into the motors through the various pipes, as shown.

When the motors are being positively
100 driven, the pistons of the reverse motors run idle and form balance wheels for the shaft upon which they are mounted, while the pistons of the positively driven motors will act as balance wheels when the reverse motors
105 are used.

As shown in Fig. 1, the motors 1 and 2 are in operation thereby giving a positive drive to the shaft 3, but should for any reason it be desired to reverse the drive of the shaft,
110 the lever 24 is swung in the opposite direction and the supply of propelling medium cut off from the motors 1 and 2 and directed into the reverse motors 4 and 5.

While I have shown the motors arranged
115 in multiples of two it will be clearly understood that any additional number of motors may be provided, or that single motors may be used if preferred.

What I claim is:

1. A battery of motors arranged in pairs, comprising casings, a shaft extending through said casings, a rotating piston for each casing and attached to said shaft, each piston having a plurality of arms radiating
125 therefrom to form pockets, one face of each arm having depressions therein, means to convey propelling medium into said pockets, and additional means to control the flow of the propelling medium into the pockets.
130

2. In a motor the combination with a casing comprising a circular band having shoulders thereon, side plates having ledges and a piston rotatably mounted in the casing, of a packing between the piston and the casing.

3. In a motor the combination with a casing having projections therein and a piston rotatably mounted in the casing, of a packing surrounding the outer edge of the piston, means to anchor the packing to said projections, and reinforcing means for the packing.

4. In a motor the combination with a casing and pistons rotatably mounted therein, of a packing surrounding the outer edge of the pistons and means to anchor the packing in position around the pistons.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES FRANCES THOMAS.

Witnesses:

W. E. WRIGHT,
WM. A. FOWLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
