I. YASSENOFF.

MOTOR.

APPLICATION FILED JAN. 7, 1909.

1,046,136. Patented Dec. 3, 1912.

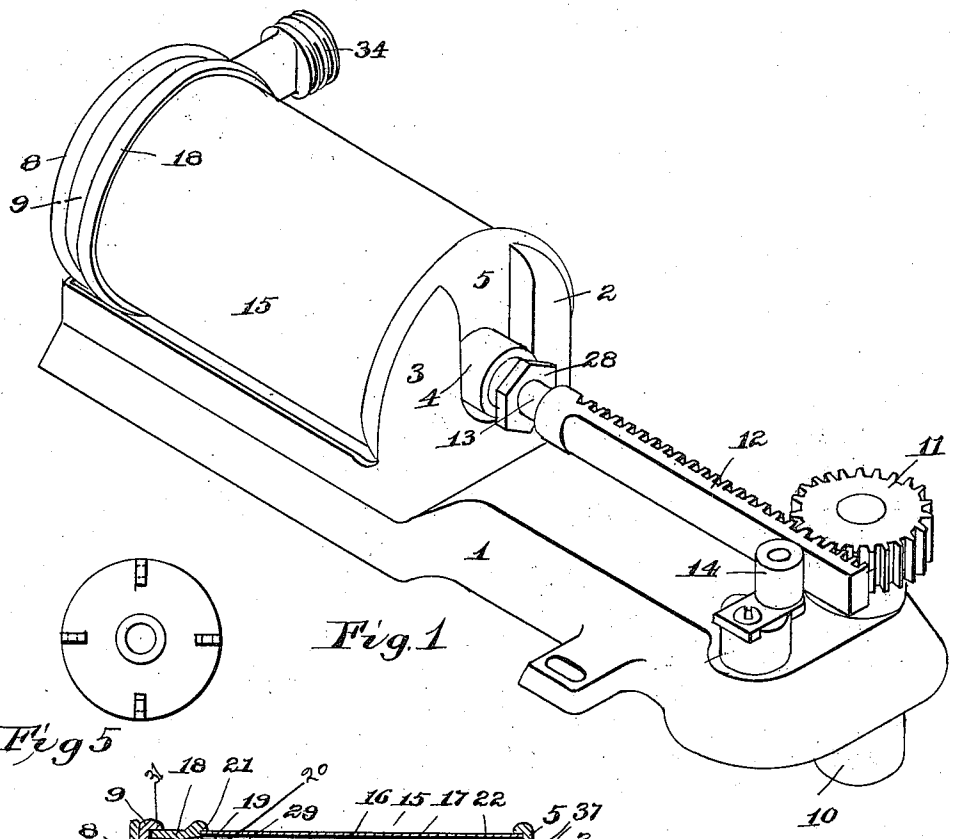


Fig. 1

Fig 5

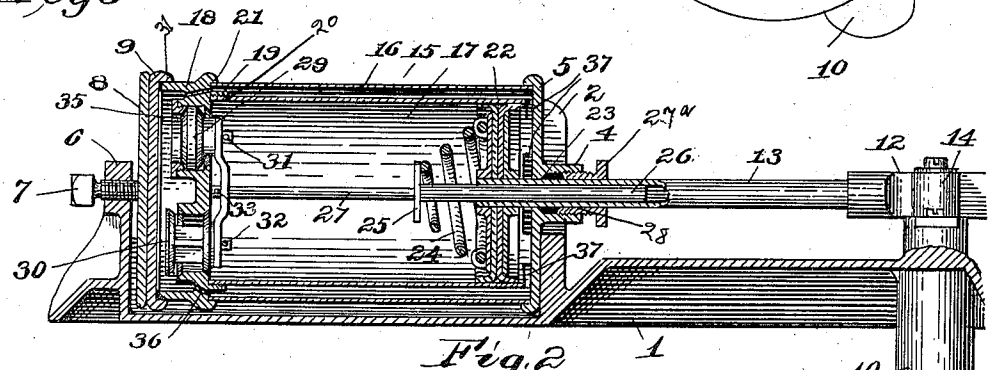
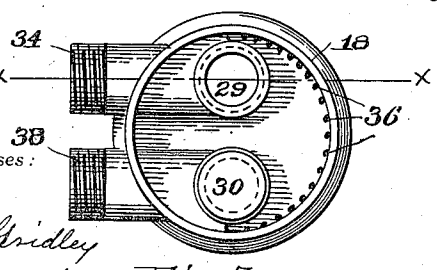


Fig. 2



Witnesses:

G. M. Gridley

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Fig. 3

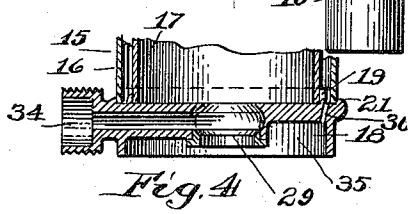

Fig. 4

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UNITED STATES PATENT OFFICE.

ISIDOR YASSENOFF, OF COLUMBUS, OHIO, ASSIGNOR TO THE SWASH MOTOR WASHER COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF OHIO.

MOTOR.

1,046,136. Specification of Letters Patent. Patented Dec. 3, 1912.

Application filed January 7, 1909. Serial No. 471,095.

To all whom it may concern:

Be it known that I, ISIDOR YASSENOFF, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Motors, of which the following is a specification.

My invention relates to improvements in motors, especially fluid operated motors, and comprises especially the use of two concentric shells having an annular space between them which answers the purposes of a port for the fluid, whereby a greater quantity of the fluid than usual may be quickly carried from the valves to the opposite side of the piston head.

It further comprises the use of a spring carried on the piston head for tripping the valves.

The invention includes the foregoing parts and their combinations which will be hereinafter more specifically set out.

Referring to the drawings which are hereto attached and hereby made a part of this specification, Figure 1 is a perspective of the motor and base; Fig. 2 is a longitudinal vertical section through the motor and base; Fig. 3 is an outer view of the end wall of the cylinder, showing the inlet and outlet ports and the position of the valves, and the circumferentially disposed openings for admitting the fluid into the annular port between the concentric shells forming the cylinder; Fig. 4 is a section through the end wall and inlet port along the line X—X of Fig. 3; Fig. 5 is a detail of the disk applied to the piston head on the face thereof looking toward the valves, and having the perforated lugs thereon for securing the spring in place.

In the drawings in which the same numeral indicates the same part throughout, 1 is the base having the standards 2 and 3 thereon for the reception of the extension 4 upon the end cap 5 of the cylinder; the standard 6 is shown at the opposite end of the base, provided with an opening through which is inserted the set screw 7 which engages at its inner end the plate 8 contacting with the opposite cap member 9 of the cylinder. When the parts of the cylinder are assembled the extension 4 is placed between the standards 2 and 3, and thereby the cylinder is positioned against lateral movement; the set screw 7 is thereupon applied to the opposite end of the cylinder, and movement thereof in any direction is effectually prevented. Thus what may be called a three-point bearing for the cylinder is provided by this form of base, into which the cylinder is readily placed, and from which it is very easily and quickly removed. This base, as seen, also provides support for the vertically disposed shaft 10, carrying at its upper end the pinion 11, which is adapted for engagement with the rack 12 carried upon the piston 13; the proper engagement of the rack and pinion is assured by the provision of the roller 14 which is so placed as to engage the back of the rack, as clearly appears in Fig. 1. The base is formed of one casting and is therefore easily made and readily handled, and inasmuch as I contemplate the use of my motor principally for washing machine purposes, the base is made of such size as to enable it readily to be attached to the ordinary washing machine tub.

The cylinder 15 is seen to be formed of detachable parts, comprising the outer shell 16, the inner shell 17, the cap member 5, and the end wall 18, the end wall having applied to its outer end the cap member 9.

The parts are assembled as follows, to wit: The end wall 18 is seen to be provided with the threaded annular extension 19, and the shell 17 is threaded externally as shown at 20, for the purpose of screwing the same into the annular flange or extension 19. The end cap 5 is then applied to the outer shell 16, and inasmuch as the inner shell 17 is notched at its other end at 37 openings for ports circumferentially of the inner shell are provided between the said end and the cap member 5. However, before the application of the cap member 5 to the shell 16, the piston 13 carrying the piston head 22 is inserted through the opening 23 provided in said cap member, and carrying the spring member 24, the spring member having the plate 25 secured thereto at its free end. The enlarged end 26 of the rod 27 is positioned within the hollow piston stem 13 and the latter, during the operation of the motor envelops the rod 27 and its enlarged portion

26. After the parts mentioned have been positioned in the cap member 5, the hollow threaded screw member 27 which has been previously positioned upon the piston 13 is turned inwardly to engage the internally threaded extension 4 on the cap member 5, and a snug bearing for the piston 13 is thereby provided by means of the opening 28 in the said hollow screw member 27a.

It will be understood that the inlet valve 29 and the exhaust valve 30 are positioned in the end wall 18 before the latter has the shells 16 and 17 secured thereon; the cap member 9 is next positioned upon the external flange of the end wall 18, the flange portion 31 of the cap member 9 snugly engaging the flange portion of the said end wall 18. The plate member 8, which may, if desired be secured to the cap member 9, is now positioned, and the set screw 7 is turned thereagainst until the whole motor construction is forced into snug engagement with the standards 2 and 3, whereby the motor is properly positioned for operation. The valves 29 and 30 are provided with short stems 31 and 32, upon which is secured the plate 33, to which the rod 27 is attached; it is readily seen that if a force be exerted against the plate 33, the valves will be moved into one position in the end wall, and if an opposite force is exerted against the plate 33, the position of the valves will be reversed; the force needed for the purpose of positioning the valves is supplied by the spring 24 which travels with the piston 22, and as the piston moves outwardly, or toward the right as seen in Fig. 2, the plate 25 carried by the spring member 24 engages the inner end of the enlarged portion 26 of the rod 27, and because of the connection between the latter and the plate 33, the valves are moved toward the interior of the cylinder. When the piston travels in the opposite direction, or in other words is moving inwardly, the plate 25 carried by the spring member 24 will, near the end of the stroke of the piston, contact with the plate 33, whereby the valves are moved toward the end plate or cap member 9. The water or fluid operating the motor is admitted through the port 34 through the end wall 18, and in the position of the valves shown in Fig. 2, the water thus entering through port 34 is directed by the valve into the internal cylinder formed by the shell 17, and operates therein to drive the piston head 22 into the position shown in said Fig. 2. The piston approaching the limit of its travel in that direction, the plate 25 carried by the spring member 24 engages the enlarged portion 26 of the rod 27 and thereby pulls the valves into the opposite position from that shown in Fig. 2, whereupon fluid pressure entering port 34 will be guided by valve 29 into the chamber 35 between the cap member 9 and the end wall 18. The fluid pressure thus entering this chamber 35 will pass through the perforations 36 into the annular space between the shells 16 and 17, and will be admitted into the inner shell through the notches 37. The fluid pressure thus admitted to the inner shell will operate to drive the piston head 22 toward the left as seen in Fig. 2, and when the piston is approaching the end of its stroke in that direction the plate 25 will engage the plate 33 and drive the valves into the opposite position. The exhaust valve 30, by its connection with the plate 33 and the stem 27, is moved simultaneously with valve 29, but as valve 29 is moved into one position, valve 30 is positioned to open in the opposite direction, in a manner well understood. The positioning of the valve 30 therefore provides the exhaust for the spent fluid pressure.

From the foregoing description it will be seen that my construction embodies essentially an annular port formed by the concentric cylinder shells, the fluid pressure being thereby conducted to the remote end of the inner shell, where it is effective against the piston head to drive the same in a reverse direction; the exhaust of the fluid thus entering to operate the piston is effected in a reverse direction through the annular port and the perforations 36 and the valve 30 into the exhaust port 38, and thence is carried away as desired; further, the spring member for tripping the valves is carried directly on the piston head, and is movable therewith. It is seen that only one spring member is required, whereby the valve stems 31 and 32 may be made much shorter than in the usual construction where a spring is utilized on each side of the plate 33.

I do not desire to be restricted to the exact construction of parts shown, but desire to have the advantage of whatever forms of construction lie within the scope of the appended claims.

What I claim is:

1. A motor comprising concentric spaced apart shells, the inner one having a port formed therethrough at one end, a cap member mounted on said shells at one end, a piston rod mounted in said cap member for reciprocation, a circumferentially perforated end wall having inlet and exhaust valves mounted therein, a plate mounted on said valves, a rod connected with said plate at one end and provided with a stop at its opposite end, a spring member carried by said piston adapted to trip said valves by engagement with said stop when said piston is moving in one direction, and adapted to trip said valves by engagement of said spring member with said plate when said piston is moving in the opposite direction.

2. In a motor, a cylinder formed of concentric spaced apart shells, a piston mounted

therein for reciprocation, inlet and exhaust valves mounted in the end wall of said cylinder, a plate member associated with said valves, a rod connected to said plate member, a stop member on said rod, a spring member mounted on said piston head adapted to engage said stop to trip said valves in one direction, said spring member being adapted to engage said plate to trip said valves in the opposite direction.

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

ISIDOR YASSENOFF.

Witnesses:
J. ELWOOD BULEN,
HARRY E. BULEN.