

M. LOGAR.
MOTOR.

APPLICATION FILED NOV. 18, 1907.

Patented Jan. 19, 1909.
3 SHEETS—SHEET 1.

910,005.

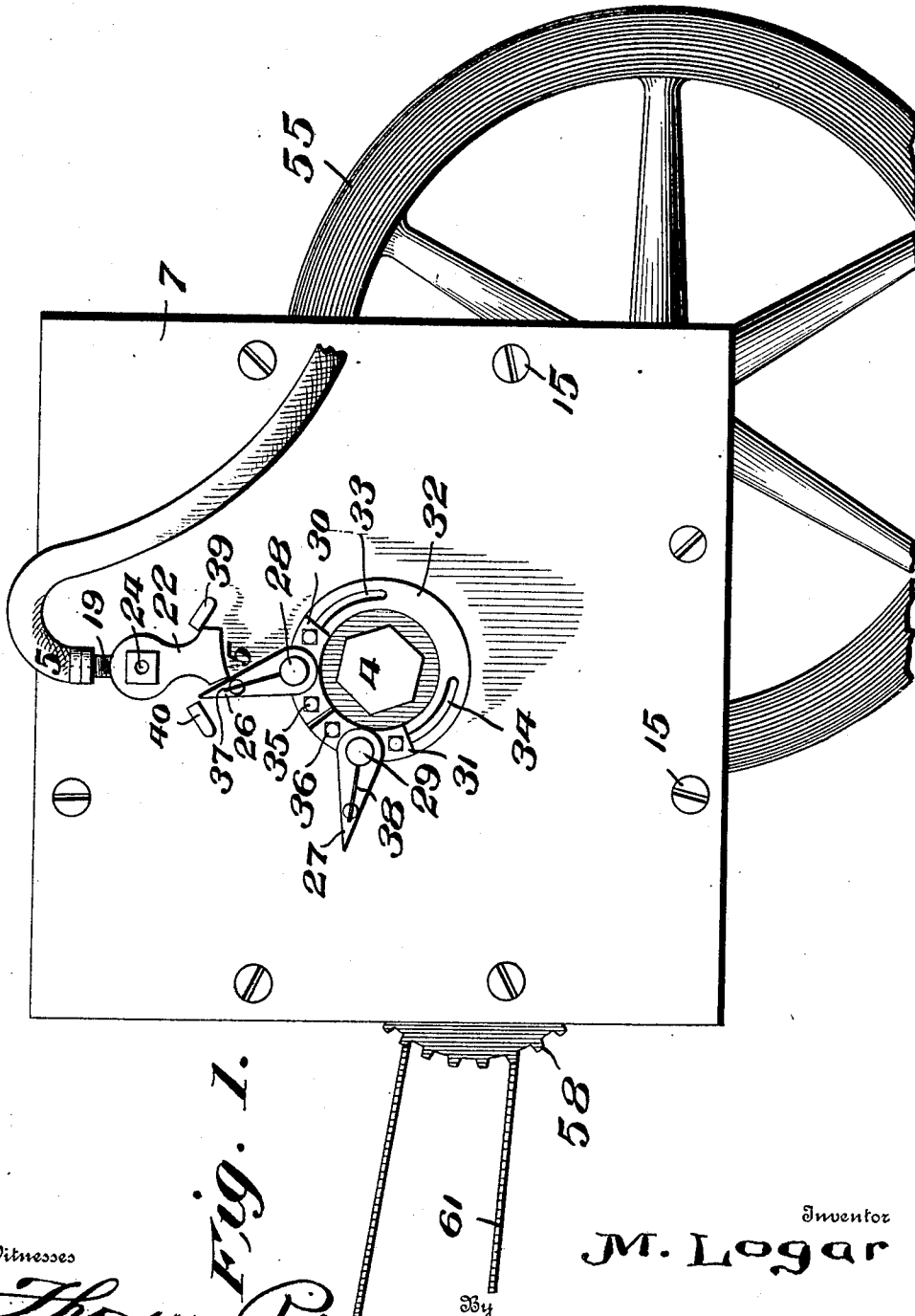


Fig. 1.

Witnesses

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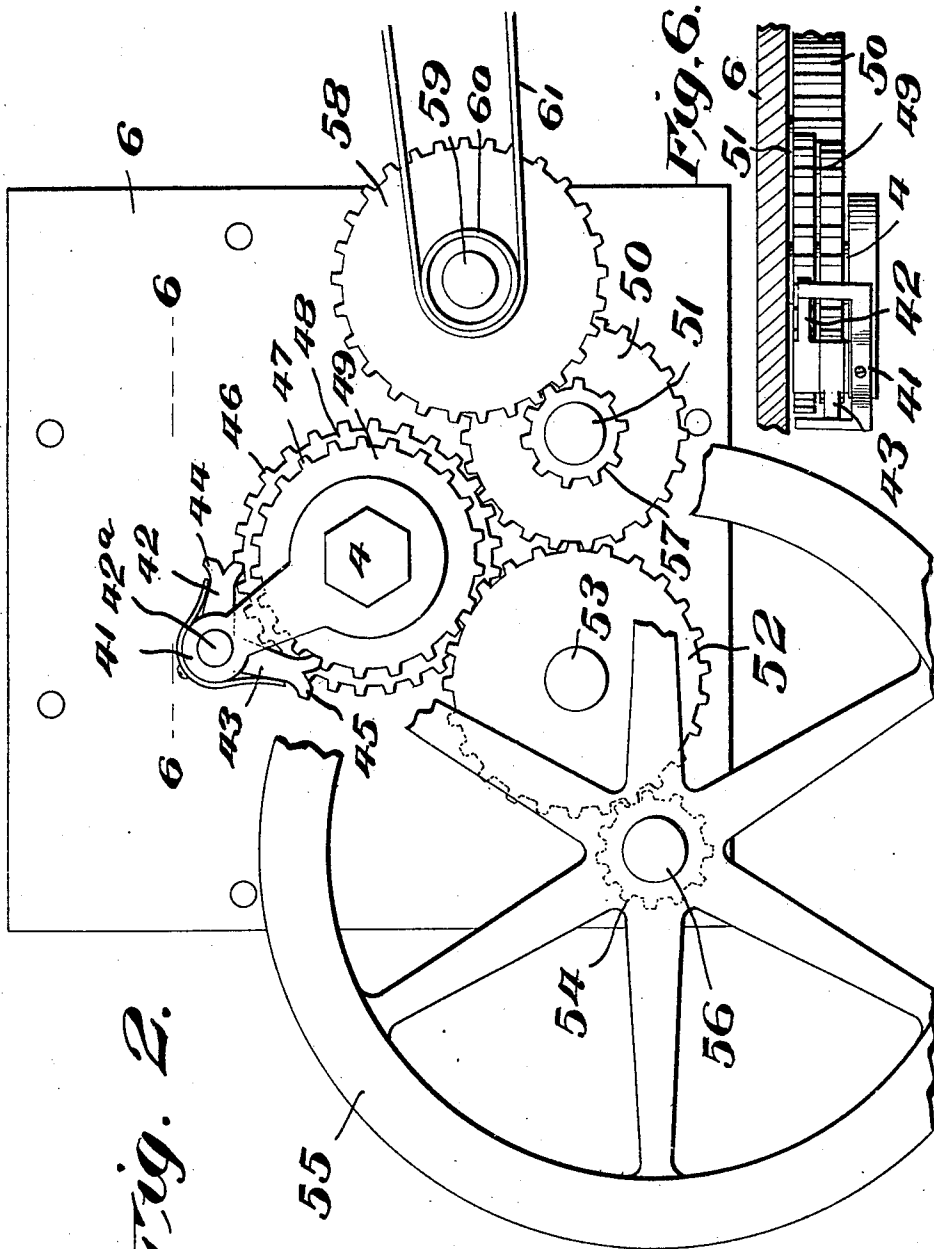


Fig. 2.

Fig. 6.

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3 SHEETS—SHEET 3.

Fig. 3.

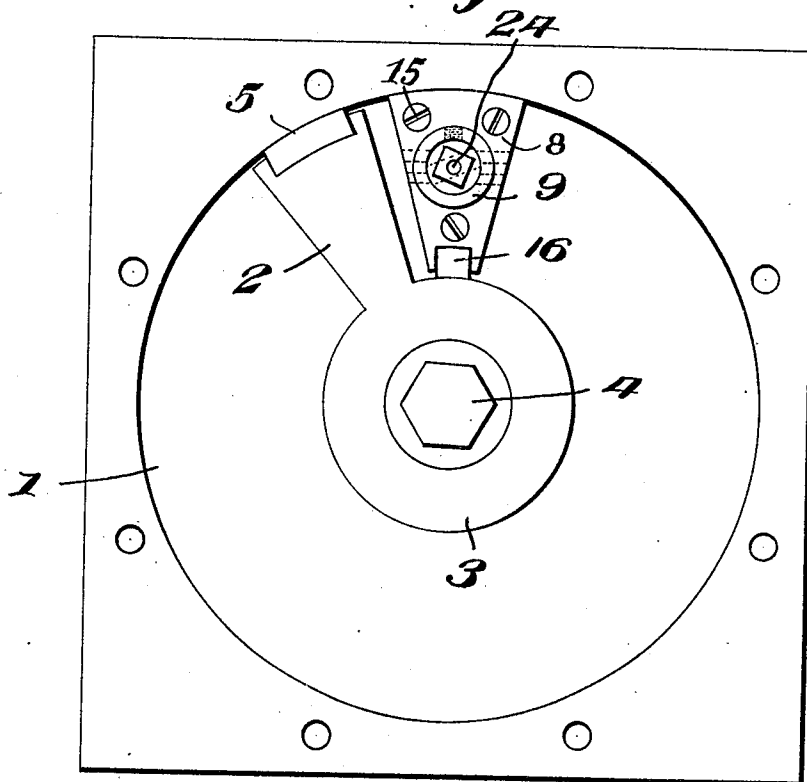


Fig. 4.

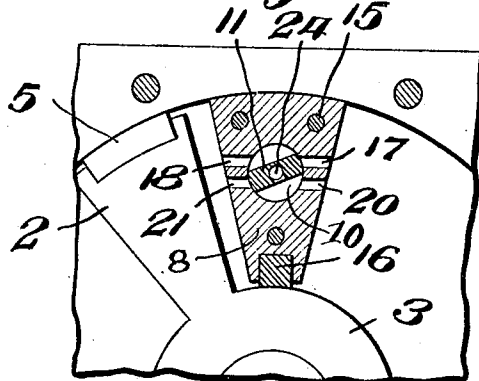
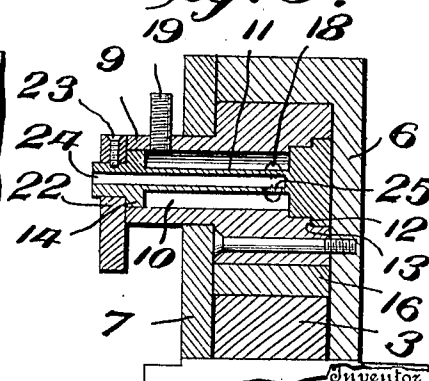


Fig. 5.



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UNITED STATES PATENT OFFICE.

MARTIN LOGAR, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-FOURTH TO JOHN A. STRAND, ONE-FOURTH TO NELS NELSON, AND ONE-HALF TO BARBARA LOGAR, ALL OF CHICAGO, ILLINOIS.

MOTOR.

No. 910,005.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MARTIN LOGAR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, 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 motors and more particularly to that class adapted to be propelled by compressed air, and my object is to provide means for controlling the introduction of the driving medium into the cylinder, whereby the piston will be given a swinging or pendulum action.

A further object is to provide means for driving the machinery, to which the engine is attached in one direction at all times.

A further object is to provide means for reversing and driving the propelling parts of the engine in opposite directions, and a still further object is to provide means for varying the stroke of the piston.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the claims.

In the accompanying drawings which are made a part of this application, Figure 1 is a side elevation of my improved form of motor. Fig. 2 is an elevation of the reverse side of the motor. Fig. 3 is an elevation of the motor with parts thereof removed. Fig. 4 is a similar view of a portion of the motor as shown in Fig. 3 with parts thereof in section. Fig. 5 is a detail sectional view as seen on line 5—5, Fig. 1, and Fig. 6 is a top plan view of a portion of the driving gear of the engine as seen from line 6—6, Fig. 2.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the cylinder of my improved engine, in which is mounted my improved form of piston 2, one end of which is provided with a circular base 3, through which extends a shaft 4, said base being fixed to the shaft.

The shaft 4 extends through the axial center of the cylinder 1 and protrudes beyond each end of the cylinder and finds a bearing in the walls of the cylinder.

The free end of the piston 2 is provided with a packing 5, which is adapted to en-

gage the inner peripheral surface of the cylinder to prevent leakage of the propelling medium between the wall of the cylinder and the piston and also to compensate for wear, it being clearly understood that as soon as the packing becomes worn, the same may be readily renewed.

Fixed within the cylinder 1, between the periphery of the circular base 3 and the inner periphery of the cylinder 1 and extending from the rear wall 6 to the front wall 7 of the cylinder, is a head 8, integral with one end of which is an extension 9, said extension and head having a bore 10 extending there-through in which is seated a valve 11, said valve being preferably flat and of a width equal to the diameter of the bore 10, so that when the valve is properly seated in the bore, a space will be formed at each side of the valve.

One end of the valve 11 is enlarged and provided with shoulders 12, which are adapted to abut against correspondingly formed ledges 13, around the periphery of the bore 10, while the opposite end of the valve 11 is provided with an integral collar 14, which snugly fits within the bore at the outer end of the extension 9.

The head 8 is secured in the cylinder in any preferred manner, as by directing bolts 15 longitudinally through the head and into the rear wall 6 and the lower edge of the head is provided with a packing 16, whereby leakage between the edge of the head and the circular base 3 is eliminated.

The piston 2 is adapted to have an intermittent oscillatory movement in the cylinder and thereby swing from side to side of the head 8, and in order to introduce the driving medium into the cylinder to accomplish this result, I provide in the side walls of the head, inlet ports 17 and 18, and the valve 11 is so arranged that when one of the ports is open, the opposite port is closed, thereby directing the propelling medium to opposite sides of the head and the inlet ports are so arranged that the driving medium will be confined in the space above the valve, said propelling medium being introduced into the bore 10 through any suitable form of conveying pipe 19. The side walls of the head 8 are also provided with exhaust ports 20 and 21, said ports being respectively arranged below the ports 17 and 18 and in such relation thereto that when one of the inlet ports is closed the

opposite exhaust port will be likewise closed, while the corresponding exhaust port is opened and, as best shown in Fig. 4 of the drawings, the driving medium is entering the cylinder through the inlet port 18, while the port 17 is closed, and at the same time, the exhaust port 20 is opened and the exhaust port 21 closed, the valve 11 serving to operate both sets of ports.

The valve 11 is extended beyond the end of the extension 9 and receives an operating lever 22, that portion of the valve beyond the collar 14 being preferably squared to enter a square opening in the upper end of the lever and the lever is fixed thereon by means of a binding screw 23.

Extending longitudinally through the axial center of the valve 11 is an outlet port 24, which extends to a point adjacent the exhaust ports 20 and 21, so that when the exhaust is directed into the space below the valve 11, the same will pass through an opening 25 in the lower face of the valve and through the outlet port 24.

The operating lever 22 is extended downwardly from the end of the valve 11 and into the path of fingers 26 and 27, said fingers being employed to move the lever laterally, whereby the valve will be partially rotated in the bore 10 to direct the propelling medium through one or the other of the inlet ports 17 or 18.

The fingers 26 and 27 are yieldingly mounted upon trunnions 28 and 29, respectively, which are in turn formed integral with plates 30 and 31, these plates being adjustably mounted on a disk 32 fixed to the projecting end of the shaft 4, the disk being provided with slots 33 and 34, through which extend adjusting bolts 35 and 36 carried by the plates 30 and 31, respectively, and by providing the slots 33 and 34, the fingers 26 and 27 may be adjusted around the periphery of the disk 32, whereby the stroke of the piston may be shortened or lengthened to increase or decrease the speed of the driving parts of the engine.

The trunnions 28 and 29 have fixed thereto, one end of springs 37 and 38, the opposite ends of said springs being fixed to the free ends of the fingers 26 and 27 respectively, so that said fingers will be yieldingly held in their initial positions.

The lateral movement of the lever 22 is limited by means of lugs 39 and 40, one of which is located at each side of the lower end of the lever and the lugs are placed at an angle to the horizontal and in the path of the upper ends of the fingers 26 and 27, so that when said fingers engage the respective lugs, they will be moved out of their initial position or laterally, until the disk is rotated sufficiently to clear the fingers of the lugs, when the tension of the springs will quickly move the fingers into engagement with the lower

end of the lever 22 and move said lever laterally, thereby shifting the valve 11 to open one of the inlet ports and exhaust ports and close the opposite inlet port and exhaust port, this operation directing the propelling medium against the opposite side of the piston causing the same to reciprocate in the opposite direction.

The power generated by the piston 2 is utilized by securing to that end of the shaft 4 extending beyond the rear wall 6, an arm 41, to the upper end of which is secured a stem 42^a having rotatably mounted thereon dogs 42 and 43. The free ends of the dogs are bifurcated to form latches 44 and 45 respectively, which are designed to engage teeth 46 and 47 on gears 48 and 49 respectively, said gears being loosely mounted on the shaft 4 between the rear wall 6 and the arm 41.

The gear 48 meshes with a gear 50, carried on a shaft 51, while the gear 49 meshes with a gear 52 carried by a shaft 53, the gear 52 also meshing with the gear 50 and with a pinion 54, which is fixed to a fly wheel 55 mounted on a shaft 56.

Fixed to the outer face of the gear 50 is a pinion 57, with which meshes a driving gear 58, said gear being mounted upon a shaft 59 and has secured to one face thereof a pulley 60, around which is extended the usual form of driving belt 61.

The shafts 51, 53, 56, and 59, are stub shafts carried by the rear wall 6, of the cylinder and project outwardly therefrom.

In operation, supposing the parts to be in the position as shown in the several figures, when the propelling medium is directed into the head 8, the same will pass through the port 18 and move the piston 2 to the opposite side of the head until the finger 27 engages and moves the lever 22 into engagement with the lug 40, which will result in closing the inlet port 18 and opening the inlet port 17 and the exhaust port 21, thereby directing the propelling medium to the opposite side of the head, the reverse movement of the piston forcing the used propelling medium through the exhaust port 21 and outlet port 24.

When the piston 2 is oscillated, the arm 41 carried by the shaft 4 is likewise oscillated and, in this instance, will direct pressure on the gear 47 and cause the same to rotate, this operation also rotating the gear 50 and the several gears in mesh therewith, the dog 42 forming a connection between the arm 41 and the gear 48. At the same time that the dog 42 is imparting movement to the gear 48, and causing the same to move in one direction, the gear 49 will be moving in the opposite direction, which will cause the dog 43 to drag over the teeth on the gear 49, until such time as the piston 2 has completed its stroke, whereupon the dog 43 will engage

the teeth on the gear 49 and form a connection between said gear and the arm 41 when the piston is driven in the opposite direction, thereby directing the power to the gear 50 through the medium of the gear 52, and, in this instance, the dog 42 will drag over the teeth on the gear 48.

It will thus be seen that although the piston is given an intermittent oscillatory movement, the several gears in connection with the motor will be positively driven in one direction. If, at any time, it is desired to drive the machinery hitched to the belt 61 in the opposite direction, the locking dogs 42 and 43 are swung to opposite sides of the stem 42^a from the position shown in the drawings, which will result in reversing the rotation of the gears 48 and 49 and the several gears operated thereby.

It will be further seen that should it be necessary to quickly stop the rotation of the several gears on the motor, this result may be accomplished by elevating both dogs out of engagement with their respective gears.

It will also be seen that when it is desired to shorten the stroke of the piston and thereby increase the speed of the motor, the plates 30 and 31 are to be adjusted in the slots 33 and 34 from the positions shown in Fig. 1, thereby causing the fingers to operate the valve before the lever has made a full stroke.

What I claim is:

1. In a motor of the class described, the combination with a cylinder, a piston in said cylinder, a supporting shaft for the piston,

a head between said piston and the peripheral wall of the cylinder, an oscillating valve mounted in said head, a lever at the outer end of said valve, and means to limit the lateral movement of said lever; of a disk carried by said shaft, plates on said disk, means to adjust said plates, a finger yieldingly carried by said plates adapted to engage the lower end of the lever and move the same laterally whereby the propelling medium will be directed to the opposite sides of the head.

2. In a motor of the class described, the combination with a cylinder, a piston in said cylinder, a head, an oscillating valve mounted in said head, and a lever at one end of said valve; of fingers adapted to extend into the path of the lower end of said lever, and means to yieldingly mount said fingers on parts of the motor, said fingers being adapted to move with the piston and engage and move the lower end of the lever whereby said propelling medium will be directed to opposite sides of the head, said fingers having movement independent of their movement with the piston when contacting with the lever.

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

MARTIN LOGAR.

Witnesses:

HENRY CORDELL,

HEROLD ECKSTEDT.