No. 675,497. Patented June 4, 1901.

C. J. POLLOCK.

MOTOR.

(Application filed Jan. 2, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

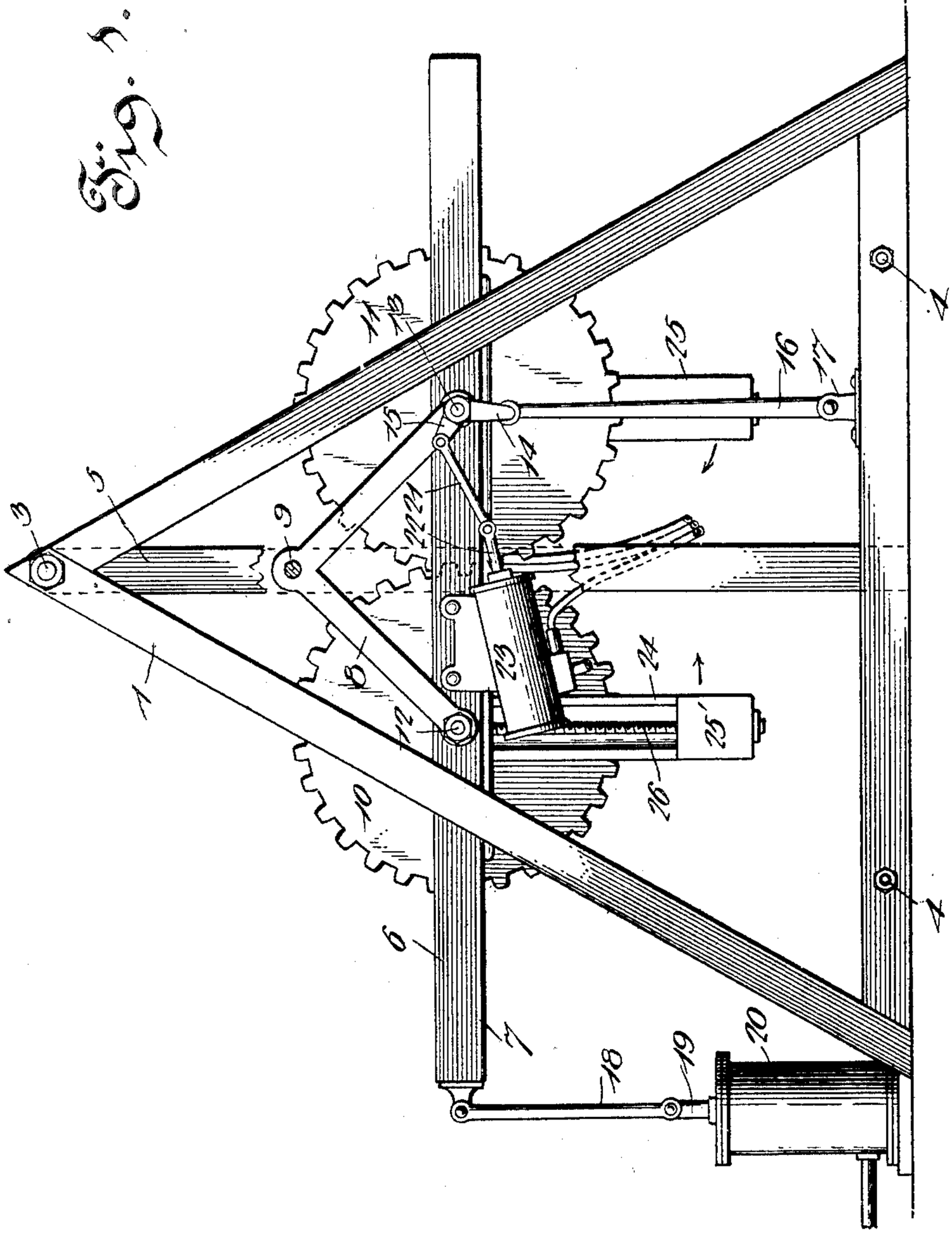

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Fig. 2.

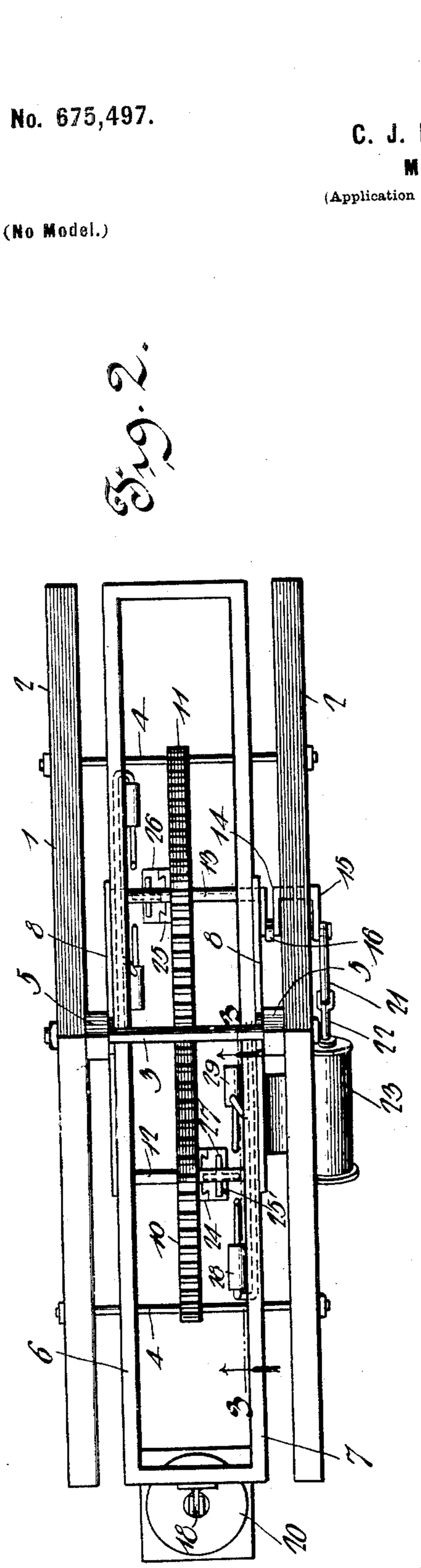


Fig. 4.

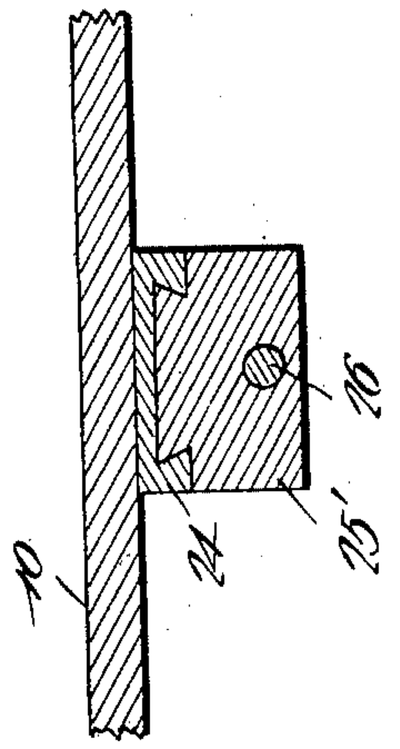
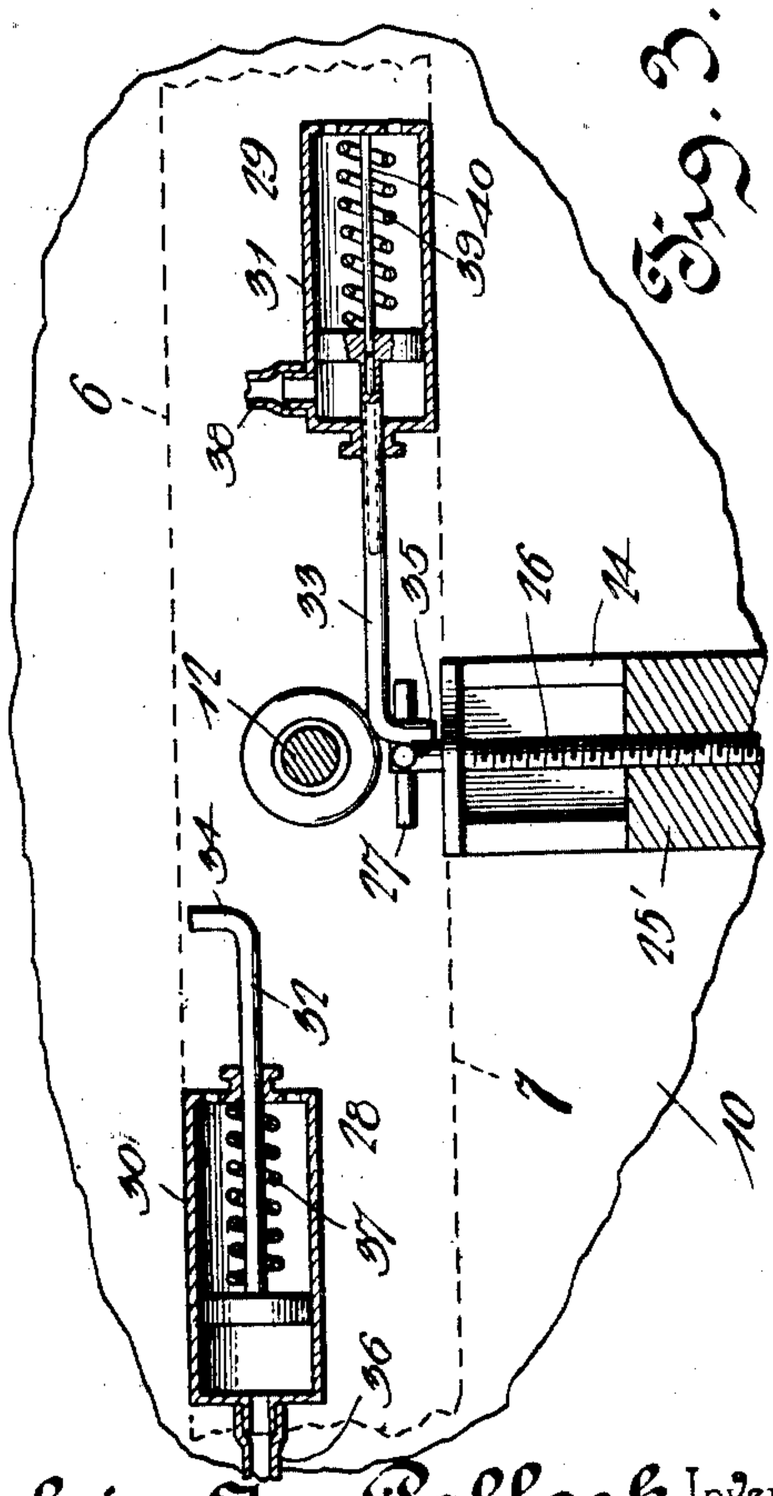


Fig. 3.



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UNITED STATES PATENT OFFICE.

CALVIN JAY POLLOCK, OF KIRKSVILLE, MISSOURI.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 675,497, dated June 4, 1901.

Application filed January 2, 1901. Serial No. 41,757. (No model.)

To all whom it may concern:

Be it known that I, CALVIN JAY POLLOCK, a citizen of the United States, residing at Kirksville, in the county of Adair and State of Missouri, have invented a new and useful Motor, of which the following is a specification.

The invention relates to improvements in motors.

The object of the present invention is to improve the construction of motors and to provide a simple and comparatively inexpensive one designed especially for operating an air-compressor and provided with rotary weights and adapted to raise the weights on the ineffective stroke of the air-compressor, so that the weights will fall or move downward on the effective stroke of the air-compressor, whereby the power will be applied most effectively to the resistance encountered.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a side elevation, partly in section, of a motor constructed in accordance with this invention. Fig. 2 is a plan view. Fig. 3 is a vertical sectional view on the line 3 3 of Fig. 2. Fig. 4 is a detail sectional view illustrating the construction of the adjustable weights.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a supporting-frame, preferably composed of two approximately triangular sides 2, connected by top and bottom transverse rods 3 and 4, and the said frame is also provided with central vertical uprights 5, located at opposite sides of the frame and secured to the triangular sides at the apex and base, as clearly indicated in Figs. 1 and 2 of the drawings. Within the main or supporting frame 1, which may be constructed in any other suitable manner, is hung an oscillating frame 6, consisting of an oblong lower portion 7 and a pair of inverted-V-shaped hangers 8, secured at the lower ends of the sides to the oblong lower portion of the oscillating frame and pivoted at their tops or apexes by suitable fastening devices 9 to the inner faces of the uprights 5 of the supporting-frame. Within the oscillating frame are mounted large gear-wheels 10 and 11, provided at their peripheries with spur-teeth and meshing with each other at the center of the oblong lower portion or body of the oscillating frame and mounted upon transvere shafts 12 and 13, as clearly illustrated in Fig. 2 of the drawings. The transverse shaft 13, upon which the gear-wheel 11 is mounted, is a crank-shaft and is provided with inner and outer cranks 14 and 15, located at one side of the main frame, and the inner crank 14, which consists of a crank-bend, is connected with the upper end of a rod or pitman 16. The rod or pitman 16, which is pivoted at its lower end to a suitable bracket 17 of the base of the frame 1, is adapted when the crank-shaft rotates to cause the suspended frame 6 to oscillate within the main frame. The oscillating frame is connected by a pitman 18 with the piston 19 of an air-compressor 20, whereby air will be compressed when the frame 6 is oscillated; but instead of connecting the oscillating frame with a compressor it may be connected with any other device, machine, or machine element to be operated. The bracket 17, which is provided with an offset ear, is suitably secured to the base of the adjacent side 2 of the main frame 1.

The outer crank 15 is connected by a pitman 21 with a piston 22 of a cylinder 23, which may be operated by steam or any other suitable means and which furnishes the necessary power for lifting the weights hereinafter described.

The gear-wheels 10 and 11 are provided at opposite sides with radially-disposed guides 24 and 25, having dovetailed ways and receiving adjustable weights 25′ and 26, adapted to be moved inward and outward longitudinally of the said guides to vary the distance between them and the centers of the gear-wheels, to vary the leverage, and to regulate the power of the motor. The weights move upward and downward simultaneously, and the parts will be so arranged that the upward movement of the weights will occur on the ineffective stroke of the compressor and will descend on the effective stroke of the said compressor, whereby the power will be applied most effectively to the resistance. The weights are provided with

threaded openings and are engaged by longitudinal screws 26, journaled in suitable bearings at the inner and outer ends of the guides and provided at their inner ends with radially-disposed arms 27, forming a wheel, and adapted to be engaged by governing devices 28 and 29, located at opposite sides of the guide and adapted to be controlled by the pressure of the air within a tank or reservoir. Each adjustable weight is controlled by a pair of governing devices arranged as clearly illustrated in Fig. 2 of the accompanying drawings, and as each pair of governing devices is constructed alike a description of one set only will be necessary. The governing devices 28 and 29 consist of stationary cylinders 30 and 31, provided with reciprocating pistons 32 and 33, adapted to be projected into the path of the wheel formed by the arms 27, whereby when the gear-wheel is rotated the screw will be given a quarter of a revolution at each revolution of the gear-wheel; but the number and arrangement of the arms 27 may be varied, if desired. The pistons 32 and 33 are provided at the outer ends of their piston-rods with lateral extensions or arms 34 and 35, adapted to engage the arms 27. The outer end of the cylinder 30 is connected by a suitable tube or pipe 36 with the tank or reservoir containing the compressed air, and when the pressure therein incident to the operation of the motor exceeds a predetermined pressure the compressed air operating on the head of the piston 32 will force the same toward the center of the gear-wheel and will carry the piston-rod into the path of the arms 27 to actuate the screw in one direction for moving the weight inward to decrease the leverage and lessen the power of the motor. This movement of the piston 32 is in opposition to a coiled spring 37, disposed on the piston-rod and interposed between the inner end of the cylinder 30 and the piston-head, and when the pressure within the tank or reservoir becomes reduced or normal the coiled spring will operate to withdraw the piston-rod out of engagement with or out of the path of the wheel formed by the arms 27. The other governing device 29 has the inner end of its cylinder 31 connected by a tube or pipe 38 with the reservoir or cylinder, and the pressure of the air when normal operates on the head of the piston 33 and compresses a coiled spring 39 and holds the rod of the piston 33 out of engagement with or out of the path of the wheel of the screw; but should the pressure within the tank or reservoir become reduced by consumption or otherwise below the normal point the piston 33 will be actuated by the coiled spring 39 and will be carried into the path of the wheel of the screw and will actuate the same and move the weights outward to increase the leverage and the consequent power of the motor to restore the normal pressure within the tank. As soon as the pressure increases the piston 33 will be moved back out of the path of the arms 27. The coiled spring 39 is disposed on a guide-rod 40, secured at its outer end to the outer end of the cylinder 31, and the inner end of the rod is arranged in a longitudinal bore of the piston 33, as clearly indicated in Fig. 3 of the drawings. When the motor is in operation, the weights are normally at the outer ends of the guides 24 and 25, and when the pressure within the reservoir reaches a predetermined amount the weights will be automatically moved inward to the inner ends of the radial guides 24 and 25. As soon as the pressure within the reservoir falls below this predetermined amount the governing device 29 will cause the weights to be again moved outward to increase the power of the motor.

The pitman 18 is arranged at the center of one end of the oblong lower or body portion of the oscillating frame 6 and the compressor 20 is connected by a suitable pipe or tube with the tank or reservoir, (not shown,) and as the frame 6 is oscillated the air will be compressed within the tank and will control the motor by the devices before described.

The cylinder 23, which is connected with the outer crank of the crank-shaft, is located at one side of the main frame, and it may be mounted on the oscillatory frame in any suitable manner, and it oscillates with the frame 6 and the gearing and furnishes the power for raising the weights.

It will be seen that the motor is simple and comparatively inexpensive in construction, and that the rotary weights which ascend on the ineffective stroke of the compressor descend and apply the full force of the machine to the compressor on the effective stroke of the same.

What I claim is—

1. In a machine of the class described, the combination of an oscillatory frame, a rotary weight mounted on the frame and connected with a fixed support, whereby the said frame will be oscillated when the weight is rotated, and means for rotating the weight and for transmitting motion from the oscillatory frame, substantially as described.

2. In a machine of the class described, the combination of an oscillatory frame, a rotary weight mounted on the oscillatory frame and connected with a fixed support, whereby the frame will be oscillated when the weight is rotated, said weight being capable of inward and outward movement toward and from its axis of rotation to vary the power, and means for automatically moving the weight inward and outward, substantially as described.

3. In a machine of the class described, the combination of an oscillatory frame, a rotary weight mounted on the frame and connected with a fixed support, whereby the frame will be oscillated when the weight is rotated, and a cylinder mounted on the oscillatory frame and having a pitman connected with and adapted to rotate the weight, substantially as described.

4. In a machine of the class described, the combination of an oscillatory frame, a rotary weight mounted thereon, means for rotating the weight, and a pitman connected with the weight and with the fixed support, whereby the frame will be oscillated when the weight is rotated, substantially as described.

5. In a machine of the class described, the combination of a main frame, an oscillatory frame suspended within the main frame, a crank-shaft mounted on the oscillatory frame, a pitman pivotally connected with the main frame and with the crank-shaft, a rotary weight carried by the crank-shaft, and means for rotating the weight, substantially as described.

6. In a machine of the class described, the combination of an oscillatory frame, gear-wheels mounted on the oscillatory frame and provided with weights, and meshing with each other, connections between the gearing and a fixed support, whereby the frame will be oscillated when the gearing is operated, and means for rotating the weights, substantially as described.

7. In a machine of the class described, the combination of an oscillatory frame, a wheel mounted on the frame and provided with a radial guide, a weight mounted in the guide and adapted to be moved inward and outward, a screw connected with the weight and adapted to actuate the same, means for connecting the wheel with a fixed support, whereby the frame will be oscillated when the wheel is rotated, and governing devices for automatically rotating the screw, substantially as described.

8. In a machine of the class described, the combination of an oscillatory frame, a pair of gear-wheels meshing with each other and mounted on the frame, and provided with weights arranged to move inward and outward radially of the said wheels, screws connected with the weights for actuating the same and provided with arms, and automatically-operating governing devices adapted to engage the arms, substantially as described.

9. In a machine of the class described, the combination of a main frame, an oscillatory frame suspended within the main frame, a pair of gear-wheels meshing with each other and mounted on the oscillatory frame and provided with weights, a crank-shaft connected with one of the gear-wheels, a pitman connecting the crank-shaft with the main frame, and a cylinder mounted on the oscillatory frame and having a piston connected with the crank-shaft, substantially as described.

10. In a machine of the class described, the combination of an oscillatory frame, a wheel mounted on the oscillatory frame and provided with a movable weight, connections between the wheel and a fixed support for oscillating the frame, a screw for actuating the weight, and a pair of governing devices designed to be operated by the pressure within a reservoir and consisting of cylinders located at opposite sides of the screw and provided with pistons for engaging the same, pipes connected with the cylinders at the ends thereof, one of the pipes being located at the inner end of one cylinder and at the outer end of the other, and the springs connected with and engaging the pistons, substantially as described.

11. In a machine of the class described, the combination of an oscillatory frame, a rotary weight, a screw connected with and adapted to move the weight inward and outward toward and from its axis of rotation, and a pair of governing devices adapted to engage the screw and composed of cylinders designed to be connected with a reservoir, and having pistons arranged to engage the screw, and springs for actuating the pistons, substantially as and for the purpose described.

12. In a machine of the class described, the combination of an oscillatory frame, a rotary weight mounted on the frame and capable of inward and outward movement toward and from its axis of rotation, connections between the weight and a fixed support for oscillating the frame, a screw for moving the weight inward and outward, and a pair of governing devices comprising cylinders having pistons arranged to engage the screw, pipes connected with the cylinders and designed to be connected with a reservoir, one of the pipes being arranged to cause an excess of pressure to move the piston outward to engage the screw, and a spring for actuating the other piston when the pressure is reduced, substantially as described.

13. In a machine of the class described, the combination of an oscillatory frame, a rotary weight mounted thereon and capable of inward and outward movement toward and from its axis of rotation, connections between the weight and a fixed support for oscillating the frame, a screw for moving the weight inward and outward, and a pair of governing devices adapted to engage the screw to rotate the same, and comprising cylinders designed to be connected with a reservoir and provided with pistons, one of the pistons being arranged to be actuated by an excess of pressure to cause it to engage the screw, and the other piston being held out of engagement by such pressure, and means for actuating the latter piston for causing the same to engage the screw when the pressure is reduced, substantially as described.

14. In a machine of the class described, the combination of a main frame, an oscillatory frame suspended within the main frame, gear-wheels meshing with each other and mounted on the oscillatory frame, radial guides located at the opposite faces of the gear-wheels, weights mounted on the guides, a crank-shaft connected with one of the gear-wheels, a pitman connected with the crank-shaft and with the main frame, a cylinder mounted on the oscillatory frame and having a piston con-

nected with the crank-shaft, screws engaging the weights and provided with arms, and the governing devices arranged in pairs at opposite sides of the machine and comprising the cylinders 30 and 31, the pistons 32 and 33 arranged at opposite sides of the screw and adapted to be projected into the path of the arms, pipes connected with the outer end of the cylinder 30 and the inner end of the cylinder 31, and springs engaging the piston and adapted to move the piston 32 backward and the piston 33 forward, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CALVIN JAY POLLOCK.

Witnesses:
H. F. RILEY,
J. M. WALKER.