

No. 660,929.

Patented Oct. 30, 1900.

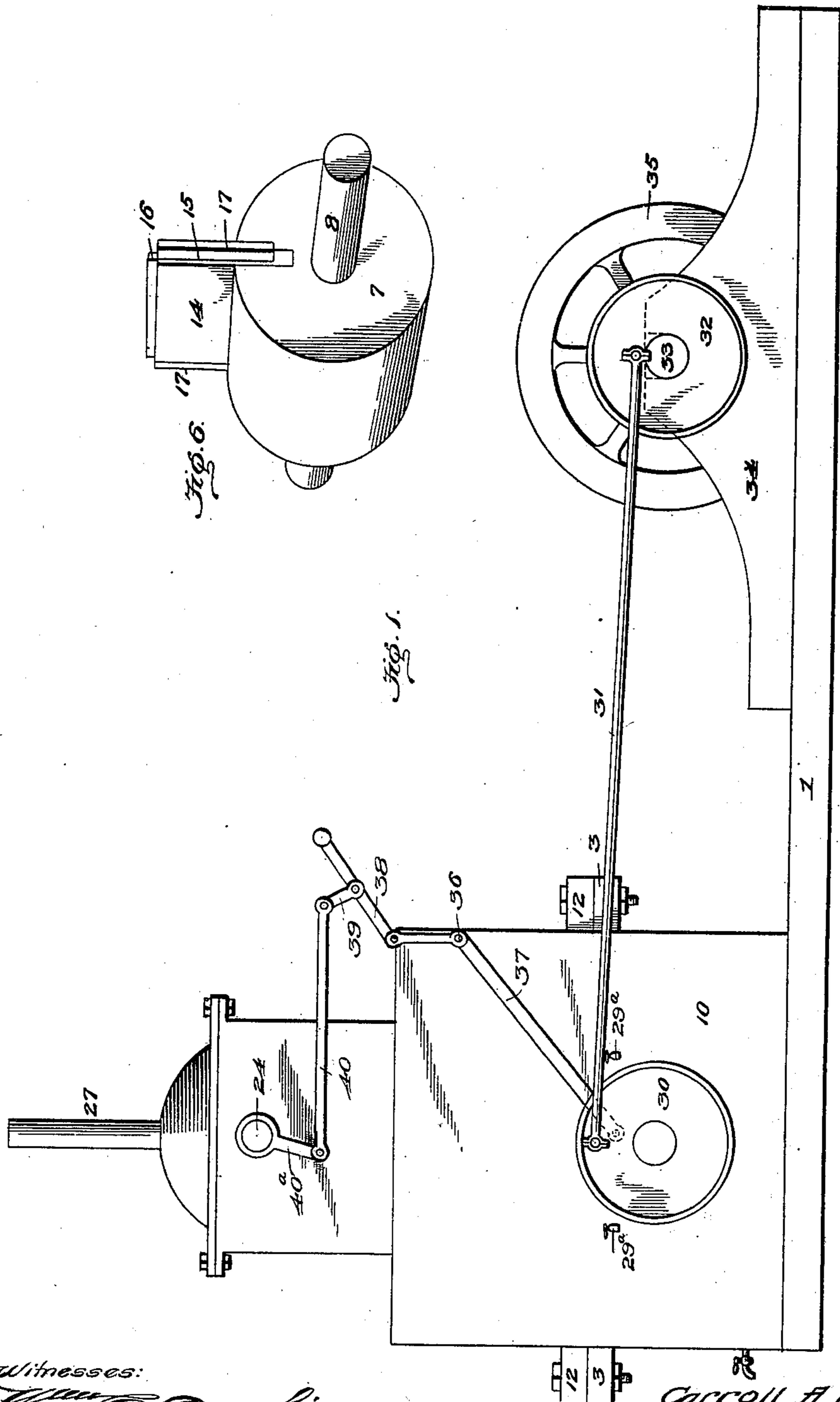
C. A. RUCKEL & W. POTTS, JR.

STEAM ENGINE.

(Application filed Feb. 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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By *David P. Moore*
Att. 544.

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2 Sheets—Sheet 2.

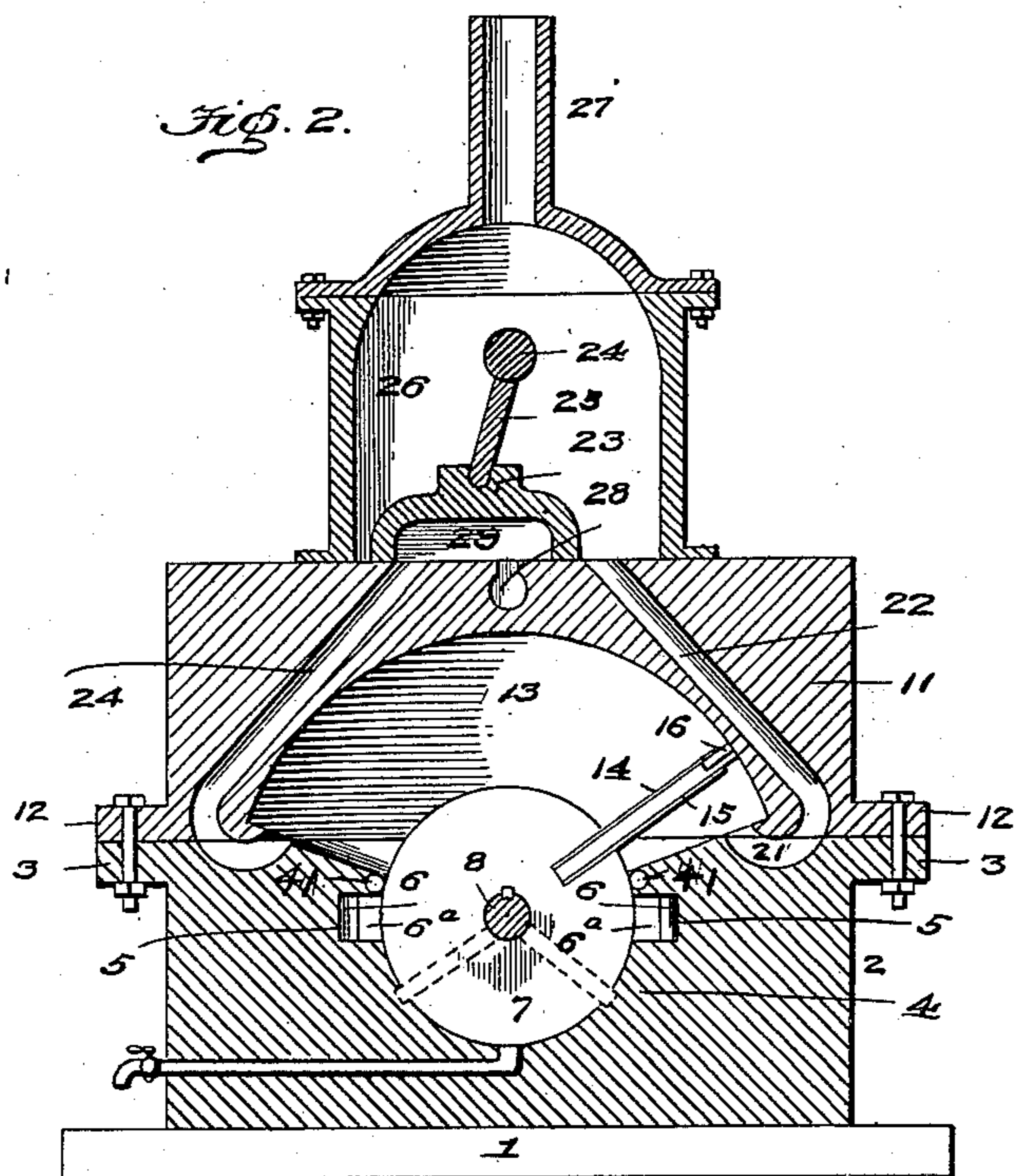


Fig. 3.

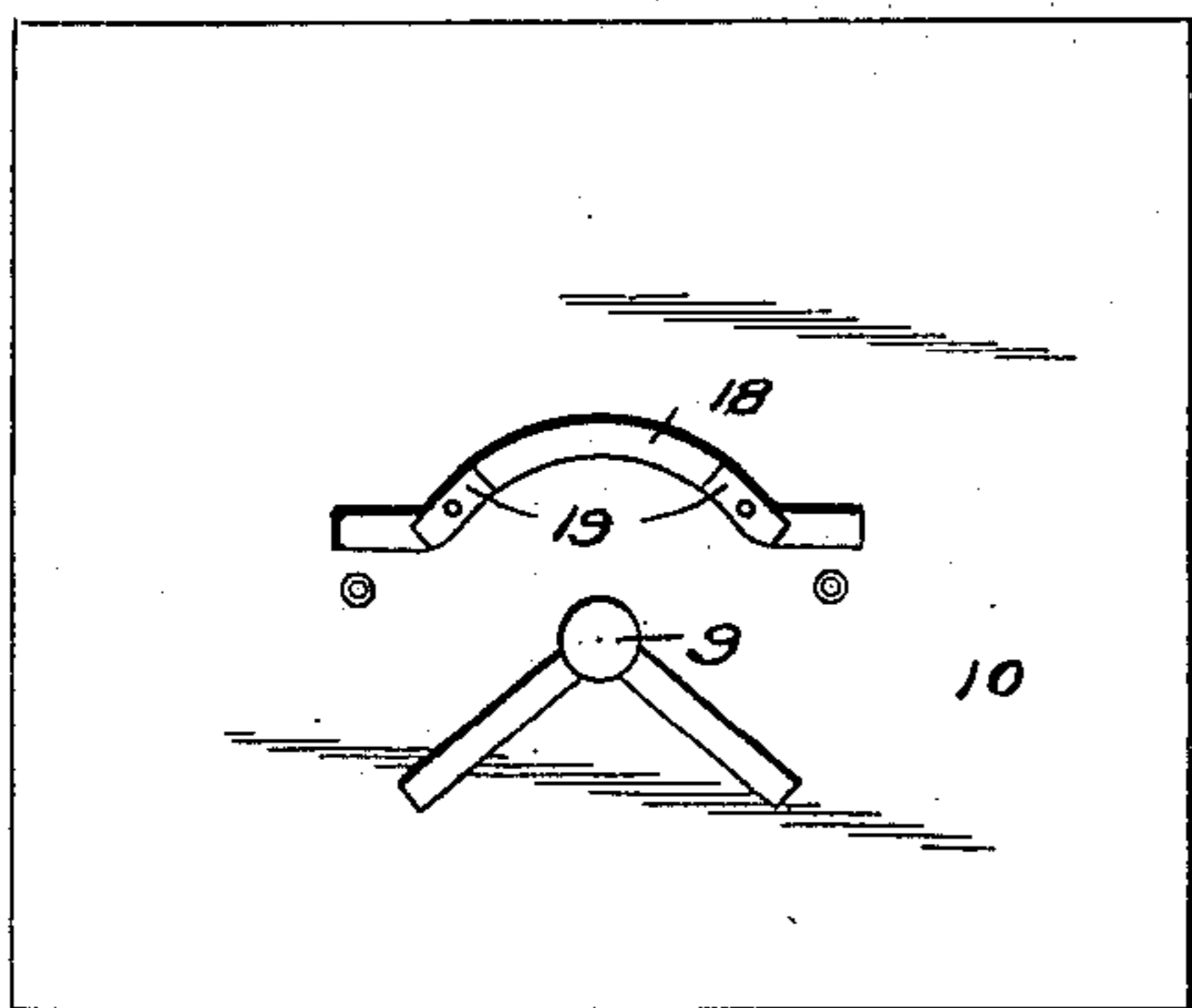
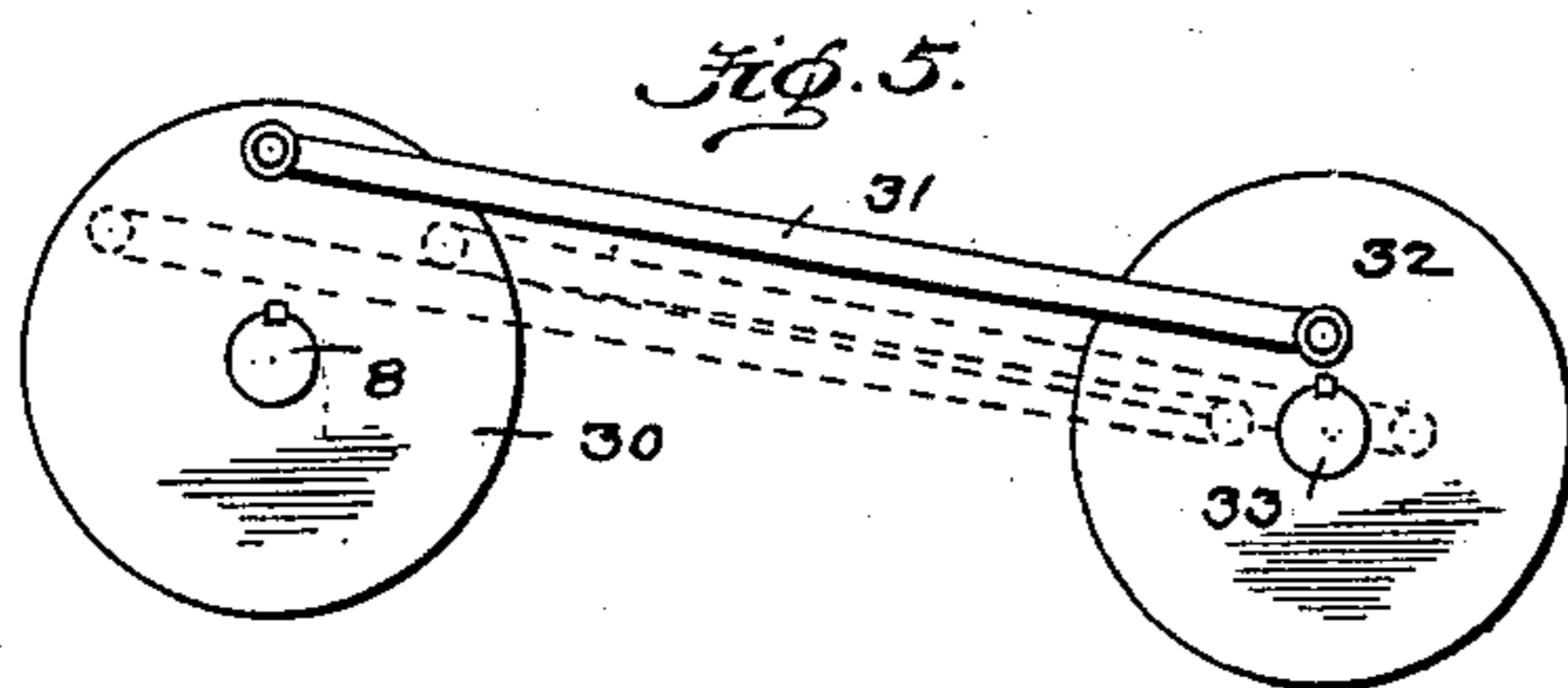
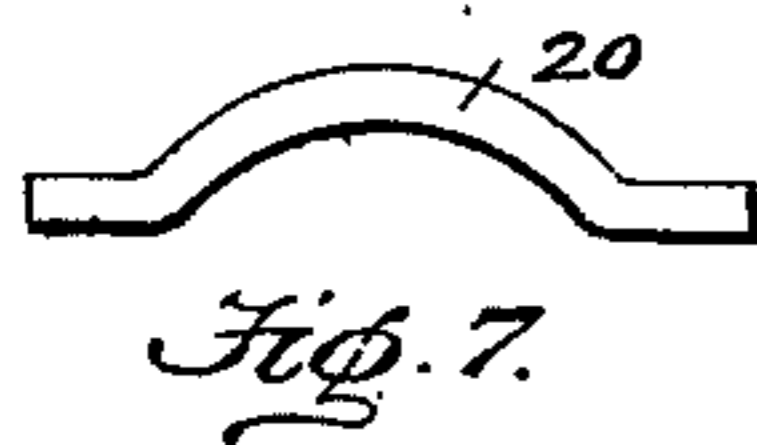
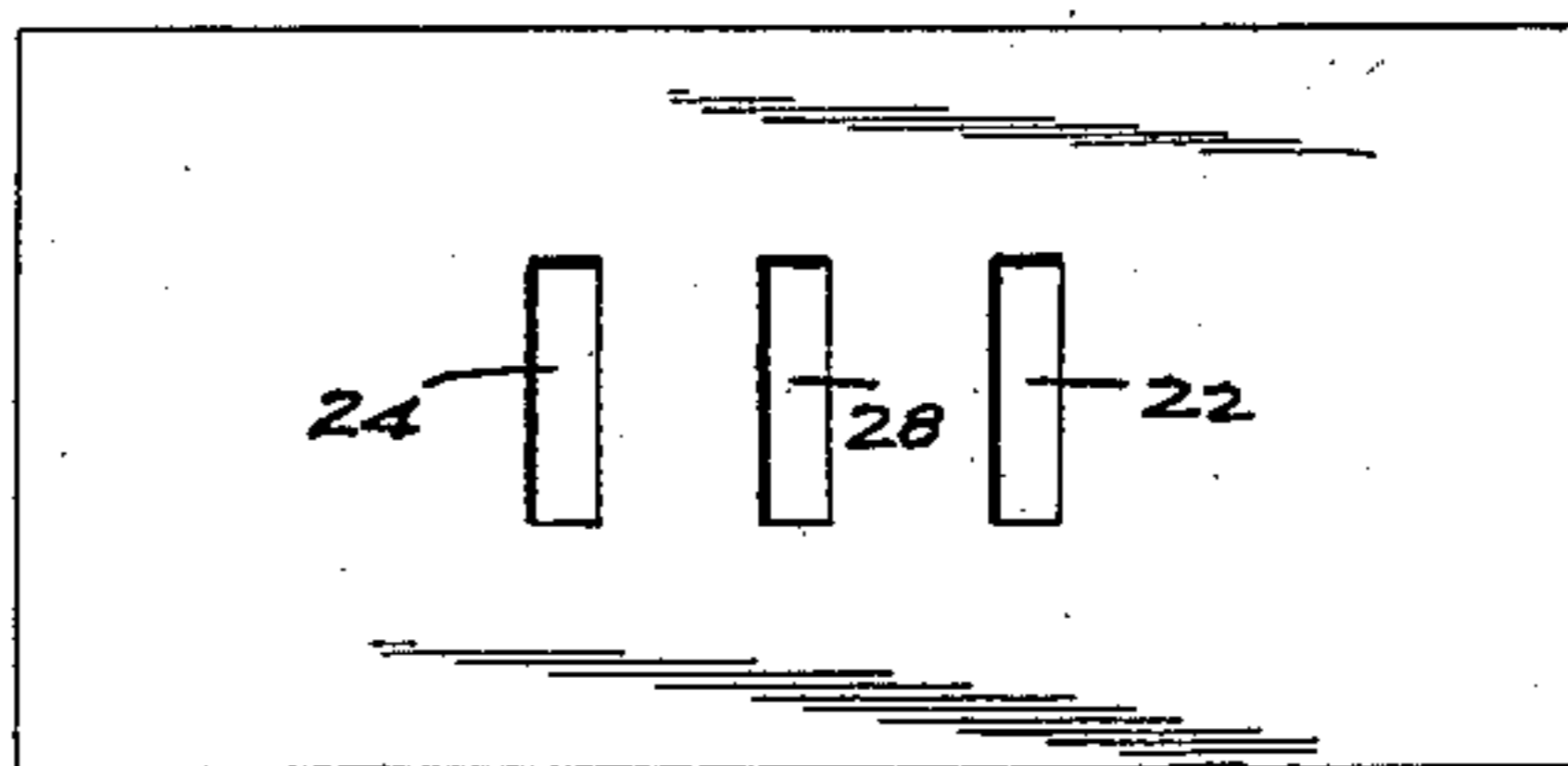


Fig. 4.



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UNITED STATES PATENT OFFICE.

CARROLL A. RUCKEL AND WILLIAM POTTS, JR., OF WHITE HALL, ILLINOIS.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 660,929, dated October 30, 1900.

Application filed February 16, 1900. Serial No. 5,475. (No model.)

To all whom it may concern:

Be it known that we, CARROLL A. RUCKEL and WILLIAM POTTS, Jr., citizens of the United States, residing at White Hall, in the county of Greene and State of Illinois, have invented certain new and useful Improvements in Steam-Engines, of which the following is a specification.

Our invention relates to improvements in steam-engines, having special reference to an improved cylinder and oscillating piston therefor.

The main object of our invention is to produce a cylinder in which is located an oscillating piston which is operated with less motive power, less friction, and less energy, as it requires but about one-third of a circle to oscillate in, thus being much quicker in its action and requiring less force to move the piston.

Another object of our invention is the provision of a cylinder and piston therefor which can be attached to any ordinary bed-plate and be connected so as to operate the engine-disk, but that in making new engines the bed-plates and other parts can be made especially for our improvement.

Another object of our invention is the provision of a very simple, durable, and inexpensive cylinder and piston therefor which is very efficient and practical.

In the drawings, Figure 1 is a side elevation of an engine constructed in accordance with and embodying our invention. Fig. 2 is a vertical central sectional view thereof, the rods and driven wheels not being shown. Fig. 3 is an interior side view of one of the side plates. Fig. 4 is a top plan view of the cylinder. Fig. 5 is a side elevation of the driving wheel or disk, the crank-shaft, and the driven wheel or disk, the course of the rod being shown in dotted lines. Fig. 6 is a perspective view of the piston, and Fig. 7 is a plan view of a packing.

Referring by numerals to the drawings, the numeral 1 designates the base of the engine, upon which is mounted the large casting 2, provided with the offsets 3 and with the bearing or piston-casing 4, the slots or recesses 5 being provided in the body of the casing upon either side of the bearing with springs 6. The packing 6^a fits upon said spring in the re-

cesses and fits snugly yet yielding against the sides of the cylindrical piston 7, further journaled on the axle or shaft 8, journaled in the openings 9 of the side plates 10 of the cylinder. The upper casting 11 is provided with the offsets 12, which abut against the offsets of the lower casting and are secured together by means of bolts, so as to make a steam-tight joint between the offsets and castings. A large arched space 13 is provided in the casting 11, which is adapted to allow for the passage of the wing or blade 14, carried by the piston. This wing consists of the two plates 15 and the spring-actuated packing-plates 16 and 17 upon the upper edge and sides in the space between the plates, so as to make a virtually steam-tight joint with the top of the arched steam-space and the inner sides of the side plates of the cylinder, the side plates being provided with the segmental recess 18, having the springs 19 to actuate the segmental packing 20, which impinges the ends of the piston.

Formed in the body of the upper casting and leading from the top thereof through the curved channels 21 of the lower casting are the power-conducting channels 22, whose mouths are covered alternately one at a time by means of the cut-off or valve 23, which is operated by the shaft 24, carrying the depending arm 25, which is connected directly to the valve, the shaft 24 being journaled in the side of the chest 26, supplied with power by the conducting-pipe 27. This valve, while it covers one of the steam-conducting pipes, always covers the mouth of the exhaust 28, as the recess or cup 29 of the valve is always so that the steam is forced into the steam-chest, passing through the conducting-channel not covered by the valve down into the arched space of the cylinder, forcing the wing of the piston toward the other side of the space, where the power passes through the other steam-conducting channel in the recess of the valve and out of the exhaust. We employ the oil-drain 29^a to drain the oil from the cylinder.

Upon the outside and journaled upon the end of the main shaft is the driving-wheel 30, which has connected therewith the piston-connecting rod 31, connected to the driven

wheel 32 near the center thereof, this wheel being mounted upon the shaft 33, journaled in the bearings 34 and carrying upon the other end the fly-wheel 35. In Fig. 5 we have shown the course of the piston-connecting rod in dotted lines, and as the rod's end connected to the driving-wheel is nearer the periphery of the wheel and its other end is located near the center of the driven wheel the oscillating movement of the piston causes the rod to be pushed forward and pulled back, so that the driven wheel is revolved.

Secured to near one corner of one of the side plates by means of a bearing or pin 36 is the bell-crank lever 37, having its lower end connected to the inner side of the driving-wheel 30 and having its upper end connected to the rod or arm 38, connected to the short arm 39, having connected thereto the horizontal arm or rod 40, connected to the depending arm 40^a of the shaft 24 to operate the valve 23. Drains 41 are employed to drain the space 13.

From this description, taken in connection with the drawings, the operation of our improved cylinder and piston is readily understood and its numerous advantages fully appreciated; but the operation, briefly stated, is as follows: The steam, compressed air, liquefied air, or other motive power enters the chest, and as the piston is oscillated by the action of the power upon the wing carried thereby the valve is operated, so as to cover the opposite steam-conducting channel from the direction in which the piston is desired to move, and thus a continuous reciprocating movement is given the piston, and by reason of the connections of the piston-rod to the driving and the driven wheels the driven wheel is revolved.

Thus it will be seen that we provide a very simple, durable, and cheap cylinder and piston which is operated with but little friction, with less energy, and less waste of power saved by leverage, and it requires but a small amount of power to push the wing the short distance that is necessary for it to move to revolve the driven wheel, thus producing a very useful and practical invention.

We claim—

1. In combination with an engine, of a cylinder consisting of an upper and a lower casting, side plates secured to said castings, an oscillating cylindrical piston journaled in the lower casting, a wing or blade carried by said piston movable in a space of the upper casting, packing carried by the three free edges

of the wing, spring-actuated packings mounted in the lower casting so as to contact the piston, and means for regulating the flow of motive power to the cylinder and causing it to be directed so as to oscillate the piston.

2. A cylinder and piston of an engine consisting of a lower casting mounted upon a base and provided with a piston bearing or casing, an upper casting secured to the lower casting and provided with an arched space, side plates secured to said castings, an oscillating cylindrical piston mounted in said bearing or casing, a wing or blade carried by said piston and adapted to move within the arched space, packing carried by the three free edges of the wing, spring-actuated packings mounted in the lower casting so as to contact the piston, and means for regulating the flow of motive power to the castings and causing it to be directed so as to oscillate the piston.

3. In an engine, the combination of a chest, a cylinder consisting of an upper and a lower casting communicating with the chest, side plates connected to the castings, means for controlling the communication between the chest and cylinder, an oscillating cylindrical piston located in the lower casting, a blade or wing carried by said piston, packing carried by the three free edges of the wing, spring-actuated packings mounted in the lower casting so as to contact the piston, and means for receiving power from the piston and transmitting it to the desired machinery.

4. In combination with an engine, of a cylinder consisting of the two castings, side plates secured to said castings, an oscillating cylindrical piston journaled in the lower casting and the side plates, a wing or blade carried by said piston movable in a space of the upper casting, a wheel carried upon the outer end of the piston, and means for regulating the flow of motive power to the cylinder consisting of a valve located above the castings, means for sliding said valve from one side to the other to cause the power to be directed so as to oscillate the piston, and a series of levers connected to said means and the wheel carried upon the piston.

In testimony whereof we affix our signatures in presence of two witnesses.

CARROLL A. RUCKEL.
WILLIAM POTTS, JR.

Witnesses:

OLIVER A. MORROW,
ISAAC D. VEDDER.