

No. 620,106.

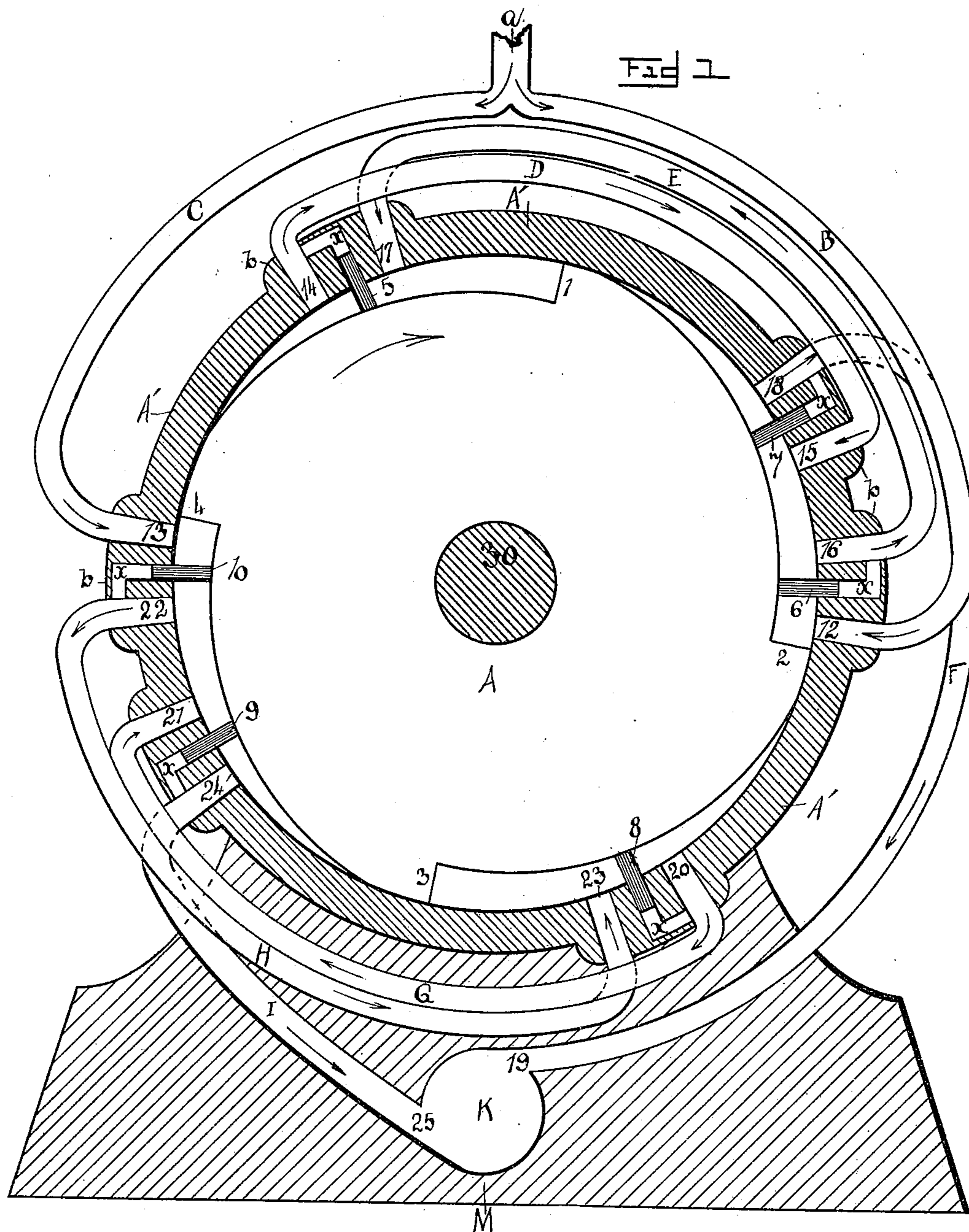
Patented Feb. 28, 1899.

G. A. CULVER.
ROTARY ENGINE.

(Application filed Mar. 16, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
A. C. Hiss.
A. M. Gilkey.

George A. Culver
INVENTOR

BY *Geo. Sues*

ATTORNEY.

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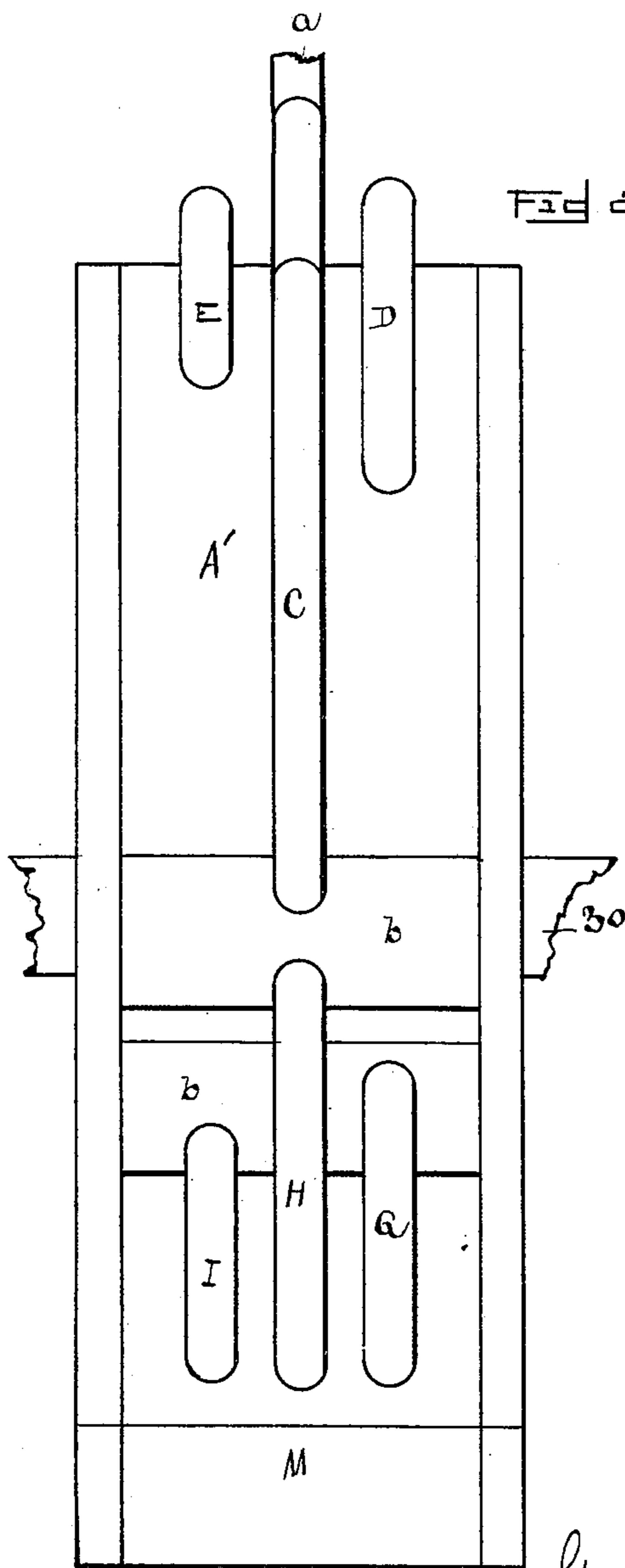
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UNITED STATES PATENT OFFICE.

GEORGE A. CULVER, OF EMERSON, IOWA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 620,106, dated February 28, 1899.

Application filed March 16, 1897. Serial No. 627,751. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. CULVER, residing at Emerson, in the county of Mills and State of Iowa, have invented certain useful
5 Improvements in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying draw-
10 ings, which form a part of this specification.

This invention relates to an improvement in rotary engines that is noticeable because of its extreme simplicity in construction.

15 In the accompanying drawings I have shown in Figure 1 a sectional elevation of an engine embodying my invention, while Fig. 2 shows a line-drawing disclosing the disposition of the various supply-pipes.

20 My invention comprises, primarily, a suitable housing, within which is positioned a rotary piston having a series of steam-pockets and being further provided with a simple system of steam ducts or flues, by means of which
25 the live steam is fed into the housing, which comprises a cylinder to actuate the piston by means of a triple expansion of the steam.

Referring to Fig. 1 I have shown a housing A', preferably cylindrical, and which is
30 supported upon a base M, and through the center of which is made to pass the shaft 30, supporting the piston A, of any suitable size and material, and being provided with the shoulders 1, 2, 3, and 4, which in conjunction
35 with the sloping peripheral surface of the piston A forms half-crescent-shaped pockets, within which the steam is permitted to expand.

In referring to the drawings it will be noticed that I have shown above and centrally
40 a main steam-supply pipe *a*, from which are diverging two live-steam-supply pipes B and C, one of which is made to enter above the center of the piston and one below the center of the same, but upon opposite sides, the pipe
45 B terminating in the port 12 and the pipe C in the port 13. At a point between the entrance-ports 12 and 13 above the center are the inlet-ports 17 and 15 and the exit-ports 14, 18, and 16. Below the ports 12 and 13 are
50 the entrance-ports 12, 23, and 21 and the exit-ports 22, 24, and 20. It will be noticed by this arrangement that I have six systems

of intake and exit ports variously dispositioned about the peripheral surface of the main casing A', but only four main intake-
55 pockets, which pockets are formed by means of the piston A.

Between each set of ports I have positioned a sliding valve, all being alike in their action and construction and which are marked 5, 6,
60 7, 8, 9, and 10. These valves all work within suitable seatings which are in communication by means of the escape-way *x* with the exhaust-steam outlets positioned adjoining to
65 the valves, so that these slide-valves will be normally forced against the peripheral surface of the segmental-shaped piston A by an air-cushion formed by the steam escaping
70 through the duct with which the valve-seating is in communication.

In referring to Fig. 1 it will be noticed that the live steam in starting the machine would work upon one side against the lower portion of the slide-valve 6 and against the piston-
75 shoulder 2 to revolve this piston in the direction of the arrow. Upon the opposite side the steam would be forced against the top of the slide-valve 10 and against the shoulder 4 to revolve the piston. Now as this shoulder
80 4 in its initial revolution passed the port 14 the steam would escape out of this port 14, and passing through the pipe D would enter at the port 15, where it would aid in expanding between valve 7 and shoulder 1, which
85 shoulder would have by that time reached that point through the pipe E backward to escape out of the port 17, where it would aid in expanding between the valve 5 and the shoulder 4, which by that time would of course
90 have passed that point. In the meantime the steam would escape out of the port 20 upon the opposite side, the shoulder 2 having passed beyond the same, and passing up the tube G escape out of the port 21, where it would aid by expanding between valve 9 and
95 shoulder 3, which shoulder would by that time have passed that port and returned to enter the port 23 to expand between the valve 8 and shoulder 2 to drive the piston forward. The piston would be revolved under this first
100 charge of steam until the shoulder 2 would arrive at the port 24, where the steam would be permitted to escape through the exhaust I, while the shoulder 4 would have passed the

port 18, permitting the steam to escape out of the exhaust 19 through the tube F. So it will be noticed that upon each side the steam is used three times to revolve the piston. In
 5 the meantime, of course, live steam is being continuously admitted, so that this operation is repeated as long as steam is permitted to feed into the cylinder.

The engine is light, portable, simple of construction and operation; and,
 10

Having thus described my said invention, what I claim as new, and desire to secure by United States Letters Patent, is—

The combination with the housing A', provided with a cylindrical opening of the base M, the shaft 30, passing centrally through
 15 said housing, the piston A secured to said shaft 30, and working snugly within said housing and provided with the shoulders 1, 2, 3, and 4, to form semicrescent-shaped pockets in junction with said housing, the main steam-supply pipe a, provided with the supply-pipe B and C, entering said housing upon opposite sides one being above and the other below
 20 the center of said piston and terminating in the intake-ports 12 and 13 respectively, the intake-ports 15 and 17 positioned above said ports 12 and 13, the exit-port 14 positioned between said ports 13 and 17, the exit-port 16
 25

positioned between said ports 12 and 15, and 30 the exit-port 18 positioned between said ports 15 and 17, the entrance-ports 21 and 23 below said ports 12 and 13, and the exit-ports 20, 22, and 24, pipe connection between said ports 14 and 15, pipe connection within said ports 35 16 and 17, and exhaust-opening within said base M, pipe connection between said port 18 and exhaust-opening, pipe connection between said ports 22 and 23, pipe connection 40 between the ports 20 and 21, pipe connection between the port 24 and said exhaust-opening, a sliding valve positioned between said ports 14 and 17, riding upon the peripheral surface of said piston A, a sliding valve positioned between said ports 15 and 18, a sliding 45 valve positioned between said ports 12 and 16, a sliding valve positioned between said ports 20 and 23, a sliding valve positioned between said ports 21 and 24, and a sliding valve positioned between said ports 50 22 and 13, all arranged substantially as and for the purpose set forth.

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

GEO. A. CULVER.

Witnesses:

XANTHUS IMEL,
 C. L. BRILL.