

No. 632,931.

Patented Sept. 12, 1899.

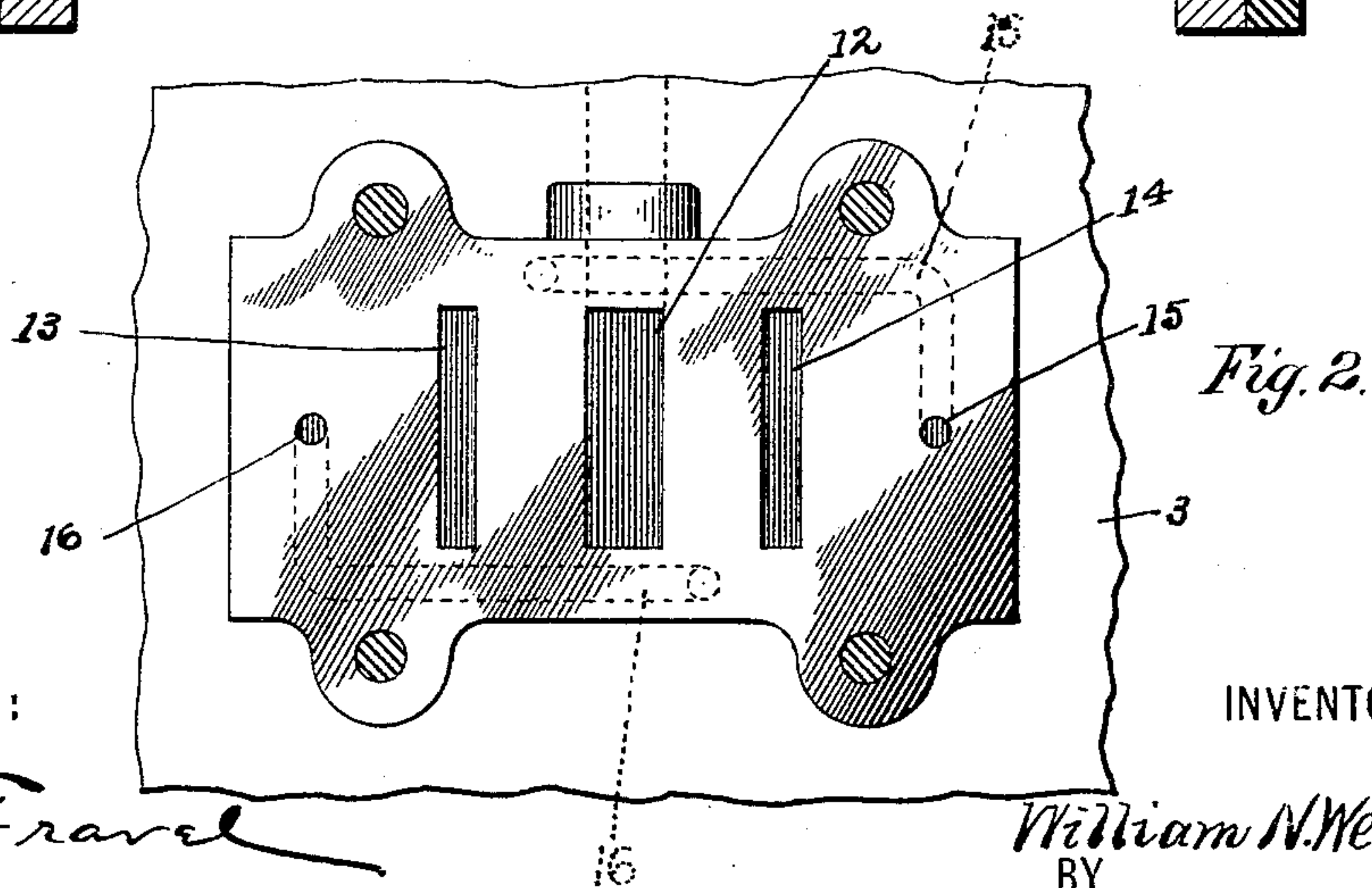
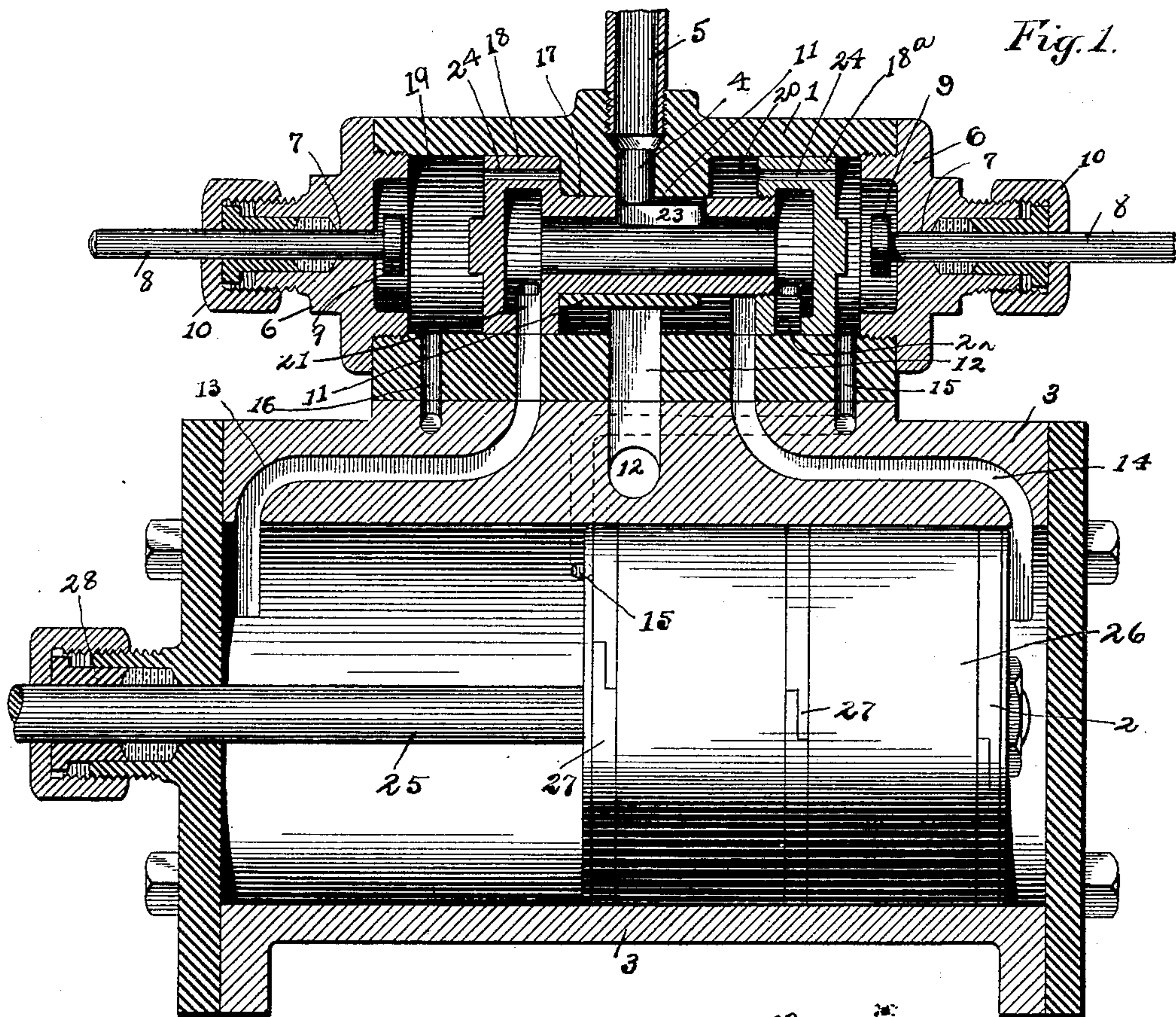
W. N. WEINMAN.

STEAM ACTUATED VALVE FOR ENGINES.

(Application filed Apr. 14, 1899)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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H. B. Bradshaw

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Fig. 3

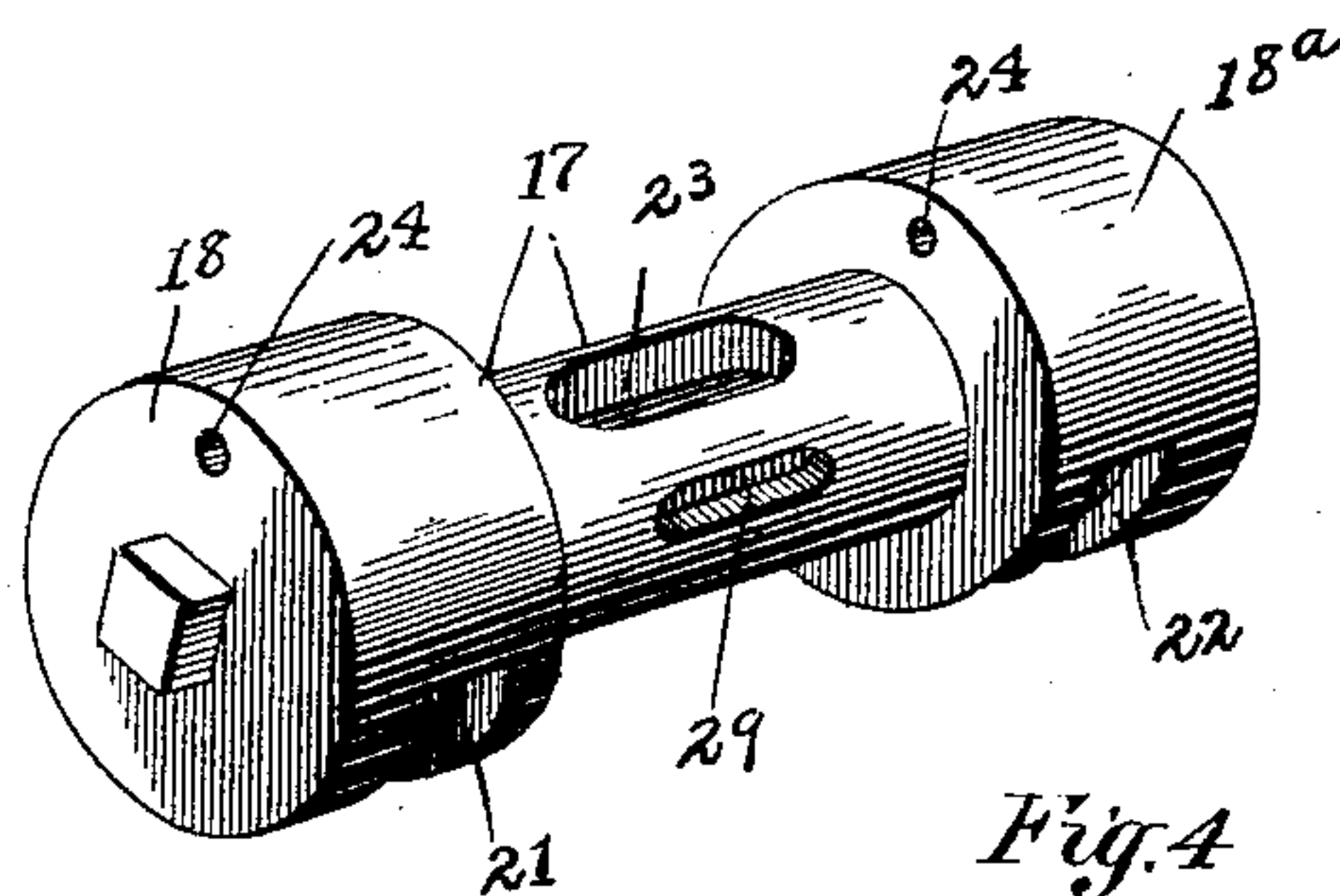
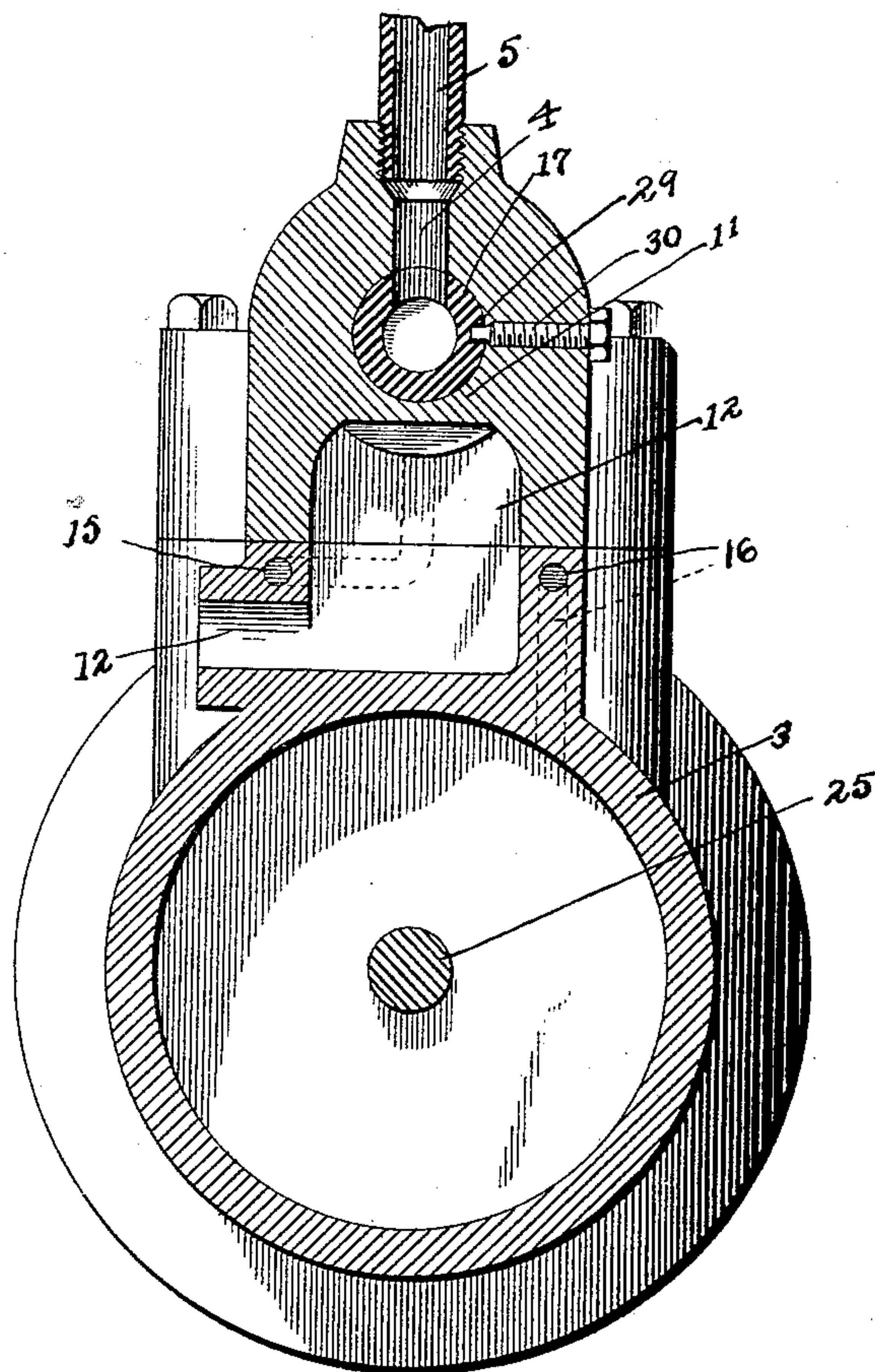


Fig. 4

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UNITED STATES PATENT OFFICE.

WILLIAM N. WEINMAN, OF COLUMBUS, OHIO.

STEAM-ACTUATED VALVE FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 632,931, dated September 12, 1899.

Application filed April 14, 1899. Serial No. 712,981. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. WEINMAN, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Steam-Actuated Valves for Engines, of which the following is a specification.

My invention relates to the improvement of steam-actuated valves for engines; and the objects of my invention are to provide an improved valve-engine of simple construction and arrangement of parts which shall be effective and positive in its operation and to produce other improvements the details of construction of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal section. Fig. 2 is a plan view of a portion of the main cylinder. Fig. 3 is a central transverse section of the engine, and Fig. 4 is a detail view in perspective of the auxiliary valve.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ an upper or auxiliary valve casing or cylinder 1, the latter having its base or lower side supported upon the upper side of the main cylinder 3. Through the wall of the cylinder 1, at the center of its length, I provide a steam-inlet opening or port 4, into which may be screwed or otherwise secured the end of a steam-pipe 5. The auxiliary valve-casing 1 is provided with end caps or heads 6, which are screwed into engagement with or otherwise detachably connected with the ends of said cylinder-body, these end caps each being provided with a central opening, which is indicated at 7, through which passes a sliding pin 8, which preferably has its inner-end or head portion enlarged, as indicated at 9. The openings in the head 6, through which the pins 8 pass, have their outer portions enlarged to form suitable packing or stuffing boxes about said pins, said stuffing-boxes being inclosed by removable caps 10. As indicated at 11, I provide the inner wall of the casing 1, at the center of its length, with a bearing-partition which extends downward

to a point in the lower portion of said cylinder. Leading downward from the lower portion of the cylinder 1 and from a point beneath the bearing 11 is an exhaust-port 12, the latter being continued, as shown in the drawings, into the upper side of the lower cylinder 3 and thence outward, as indicated more clearly in Fig. 3 of the drawings. On opposite sides of the exhaust-port 12 I cause to lead downward from the cylinder 1 ports 13 and 14, the latter being continued through the upper side of the lower cylinder 3 and leading, respectively, into opposite ends of said lower cylinder.

15 and 16 respectively represent ports which lead, as indicated in the drawings partially in full and partially in dotted lines, from the interior and opposite sides of the main cylinder 3 into opposite ends of the cylinder 1.

17 represents the auxiliary valve, which, as indicated in the drawings, consists of a horizontal central tube portion which is provided at each end with an enlarged hollow head portion, these heads being indicated at 18 and 18^a and the interior of which communicates with said central tubular portion. The valve-head 18^a is, as indicated in Fig. 1 of the drawings, preferably screwed onto the end of the tube portion 17. The substantially spool-shaped valve thus formed has its central and horizontal portion provided with a sliding support in the bearing-partition 11, while the heads 18 and 18^a are adapted to fit and bear within the valve-casing chambers 19 and 20 on opposite sides of the bearing-partition. As indicated in the drawings, each of the valve-heads 18 and 18^a is provided with an outlet-port, these ports being indicated at 21 and 22. The upper side and central portion of the valve-body 17 is also provided with an elongated inlet-opening 23, which is at all times in communication with the steam-inlet port 4. Through the upper portion of each of the valve-heads 18 and 18^a I provide a horizontal port 24.

Within the main and larger cylinder 3 I provide the driving-piston, which consists of the piston-rod 25 and piston-head 26, the latter being provided with the desired number of packing-rings 27, and said rod extending outward through one end of the cylinder and

working through a suitable stuffing-box 28, which is connected therewith. The piston-head 26 is of such length that when the same is driven to one end of the cylinder 3 but one of the diagonally-opposed outlets to the ports 15 and 16 is uncovered by said piston-head at a time. As shown more clearly in Fig. 3 of the drawings, I provide the tubular portion of the valve 17 with a longitudinal outer side recess 29, into which projects the inner reduced end of a screw 30, which passes through the wall of the cylinder 1.

In order to illustrate the operation of my improved engine, we will assume that the auxiliary valve is in the position indicated in Fig. 1 of the drawings—that is, with its head 18 abutting against the bearing-ring, the port 21 in communication with the port 13, and the port 22 out of communication with the port 14. The parts being in this position, the live steam which enters the valve 17 through the medium of the port 4 and from any desirable steam source passes downward through the ports 21 and 13 into the outer end of the cylinder 3, where it operates to drive the piston-head to the inner end of the cylinder and to the position indicated in Fig. 1. In moving the piston-head 26 to this position it is driven past the outlet-opening of the port 15, while the outlet of the port 16, which is diagonally opposite that of the port 15, is closed by said piston. The steam which has entered the cylinder in the manner above described through the port 13 passes outward and upward through the port 15 and thence into the outer end of the chamber 20, where it operates to drive the valve 17 toward the opposite end of its casing, thus bringing the ports 22 and 14 into communication and cutting out the connection between the ports 13 and 21. In this manner the steam from the valve 17, following the ports 22 and 14, leads through the latter into the end of the cylinder 3 and results in the piston-head 26 being driven to the outer end of said cylinder, in which position the outlet to the port 15 is closed and the outlet to the port 16 is opened, allowing the steam from the latter to pass upward to the chamber 19 and operate to drive the valve back to the position illustrated in the drawings. Owing to the employment of the ports 24 through the upper portions of the heads of the valve 17 it is obvious that a comparatively small portion of the steam which passes through the ports 15 and 16 into the chambers 19 and 20 escapes through said ports 24 during the entrance of said steam into said chambers; but owing to the quick action of said valve and comparative small size of said ports 24 the steam which passes therethrough is not sufficient to interfere with the correct operation of said valve. However, when the valve is driven toward one end of its cylinder or casing the steam therein will be allowed to escape through the opening or port 24 of the valve-

head and pass downward and outward through the exhaust-port 12. It will also be observed that the movement above described of the valve, whereby either one of the ports 14 or 13 is disconnected from the valve-port, results in the disconnected ports 13 or 14 being brought into communication with the space between the heads of the valve, and the steam which may rise from the ends of the cylinder 3 will thus be allowed to escape through said exhaust-port 12.

In case the engine should be left inoperative a sufficient length of time to cause, through corrosion or otherwise, a tendency of the auxiliary valve to stick in its casing in starting the same, a starting movement to said valve may be readily imparted by pressing inward on one of the pins 8 until its enlarged head, by contact with the adjoining valve-head, presses the latter into operation. It is obvious that any tendency of the valve 17 to rotate within the cylinder 1 will be obviated by the engagement of the screw 30 with the recess 29.

From the construction and operation herein shown and described it will be seen that a simple, reliable, and effective engine construction is produced in which a desirable power is generated in a positive manner.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an engine, the combination with a main and auxiliary valve-cylinder, the latter having a central bearing-partition 11 and end valve-casing chambers 19 and 20 on opposite sides of said partition a tubular sliding valve in said auxiliary cylinder, said valve having enlarged heads which fit and slide within said cylinder-chambers and having its central portion bearing in said partition 11 a steam-inlet for said valve, ports 13 and 14 leading from the valve-cylinder to opposite ends of said main cylinder, an exhaust-port between the heads of said valve and ports 21 and 22 in said valve, a reciprocating movement of said valve alternately causing the valve-ports 21 and 22 to register with the ports 13 and 14 and causing said ports 13 and 14 to alternately communicate with the exhaust-port, of a piston in said main cylinder and ports leading from said main cylinder to opposite ends of the auxiliary valve-cylinder, said ports being alternately opened and closed by the movement of said piston, substantially as specified.

2. In an engine, the combination with a main and auxiliary valve-cylinder, a tubular sliding valve in said auxiliary cylinder having enlarged heads, a steam-inlet port in communication with said valve-cylinder, ports 13 and 14 leading from the valve-cylinder to opposite ends of said main cylinder, an exhaust-port between the heads of said valve, ports 21 and 22 in said valve and ports 24 through the heads of said valves, a reciprocating movement of said valve alternately causing the

valve-ports 21 and 22 to register with the ports 13 and 14 and causing said ports 13 and 14 to alternately communicate with the exhaust-
port, of a piston in said main cylinder and
5 ports leading from said main cylinder to opposite ends of the auxiliary valve, said ports being alternately opened and closed by the

movement of said piston, substantially as specified.

WILLIAM N. WEINMAN.

In presence of—

C. C. SHEPHERD,
A. L. PHELPS.