

(No Model.)

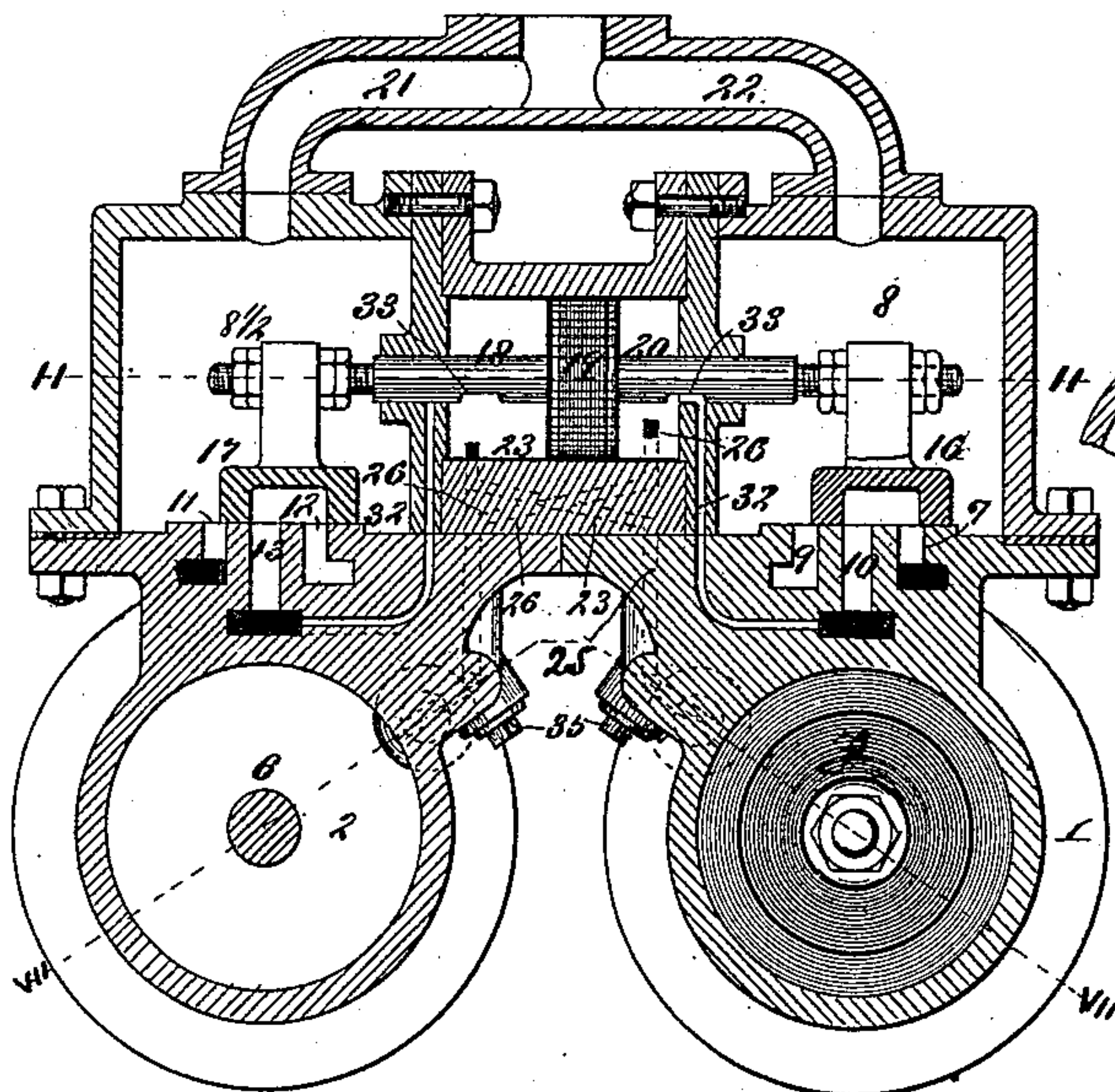
2 Sheets—Sheet 1.

F. STEINMANN.  
ENGINE.

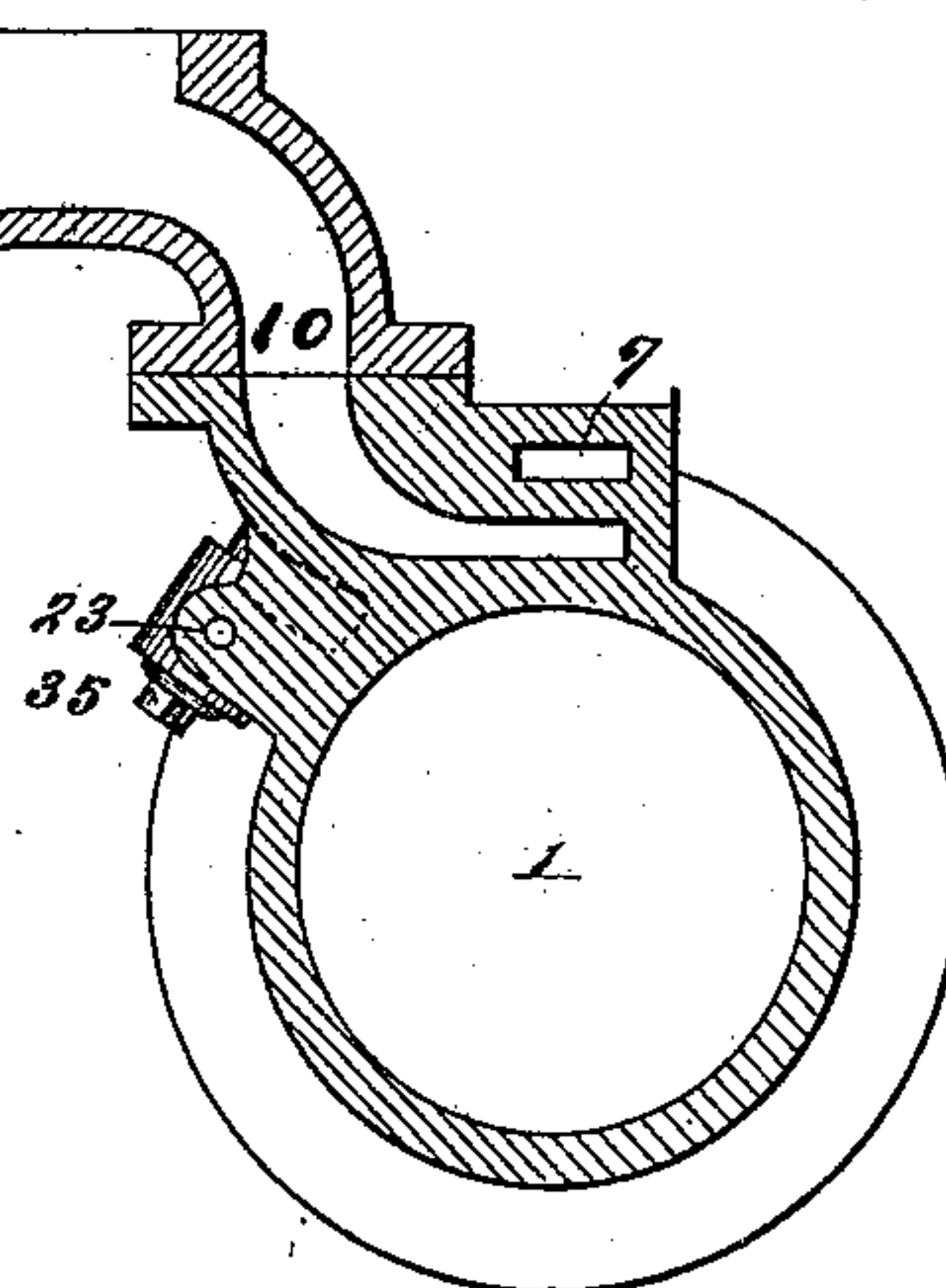
No. 420,839.

Patented Feb. 4, 1890.

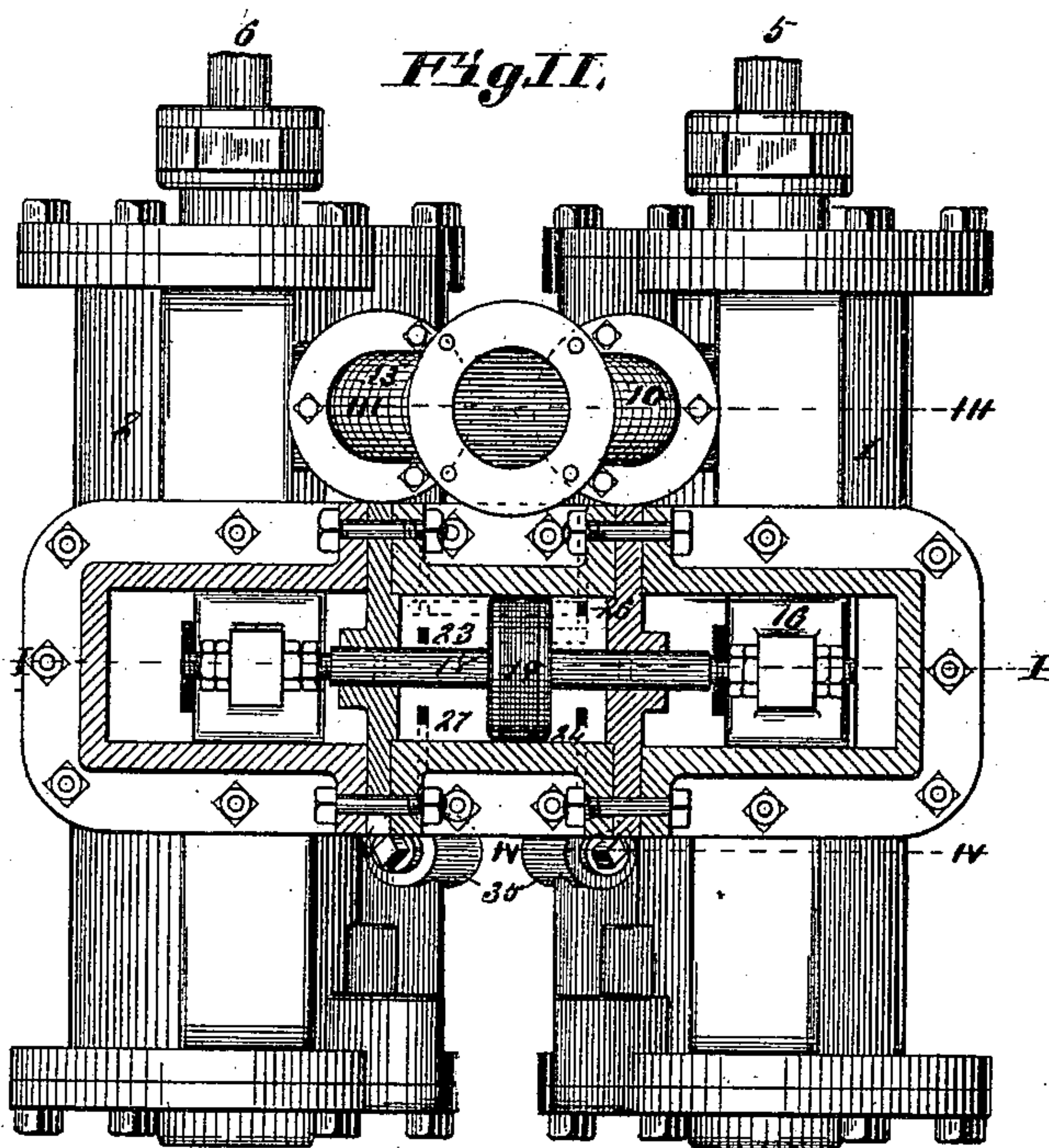
*Fig. I.*



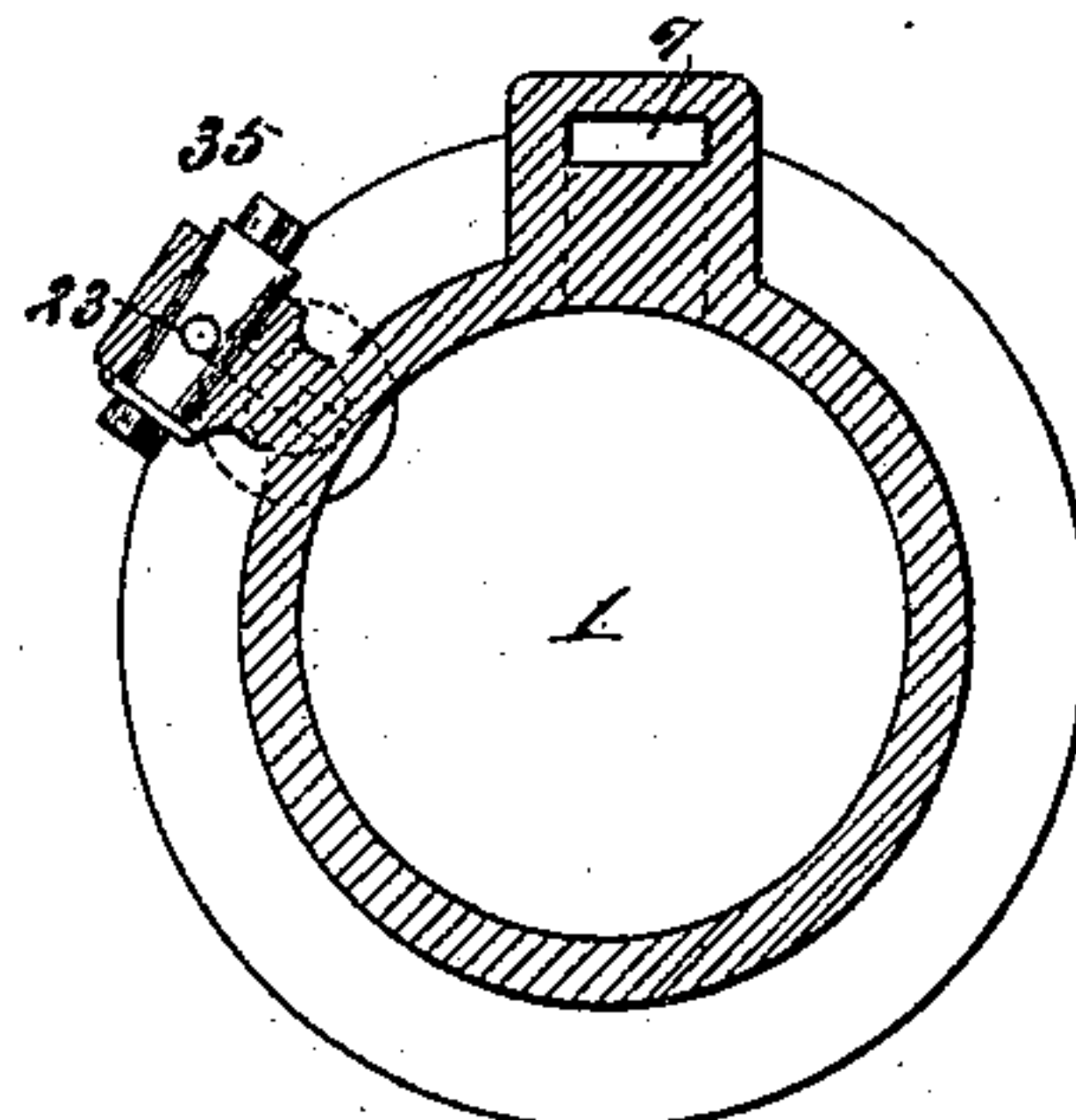
*Fig. III.*



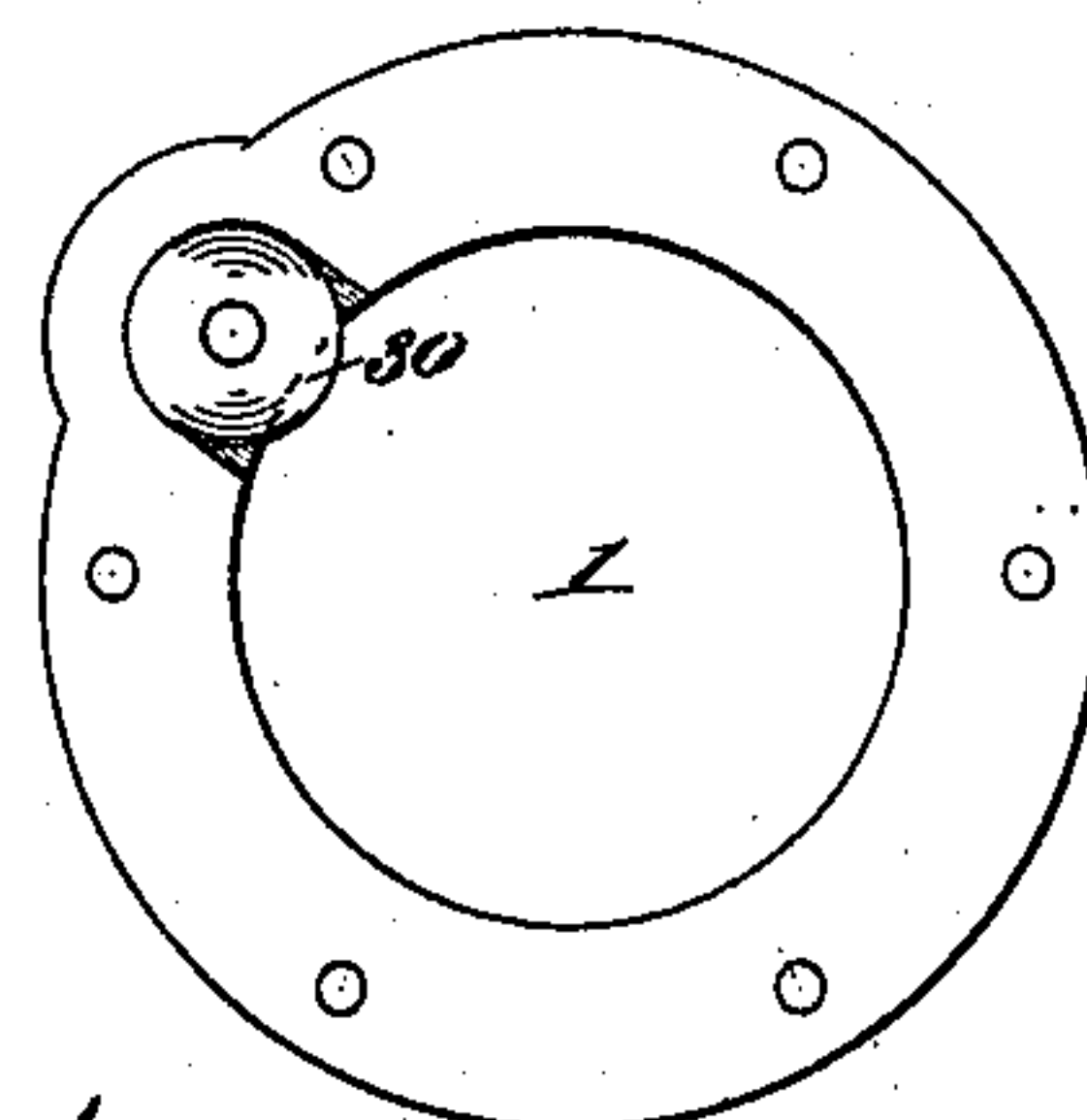
*Fig. II.*



*Fig. IV.*



*Fig. V.*



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*Charles Pickles.*  
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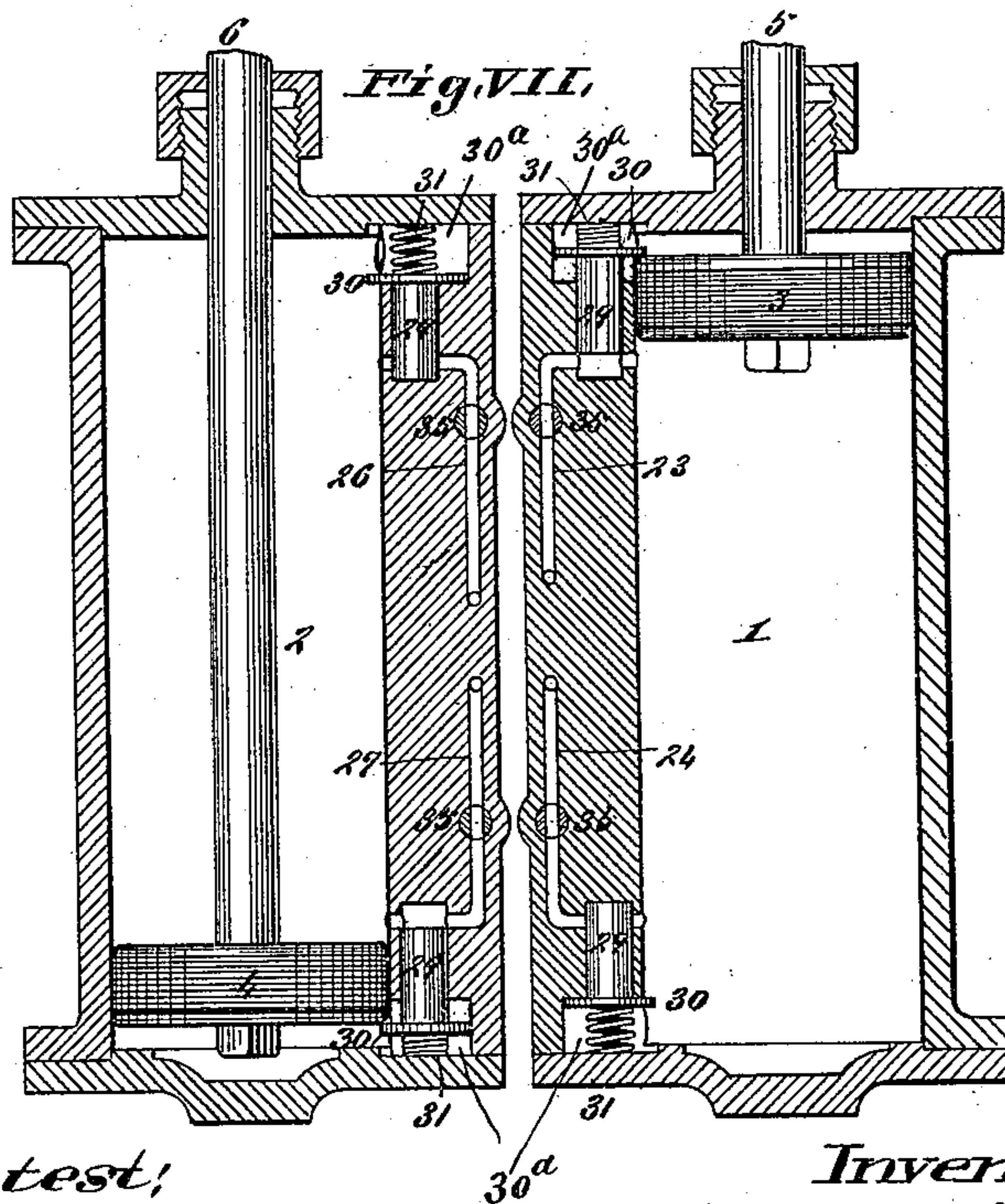
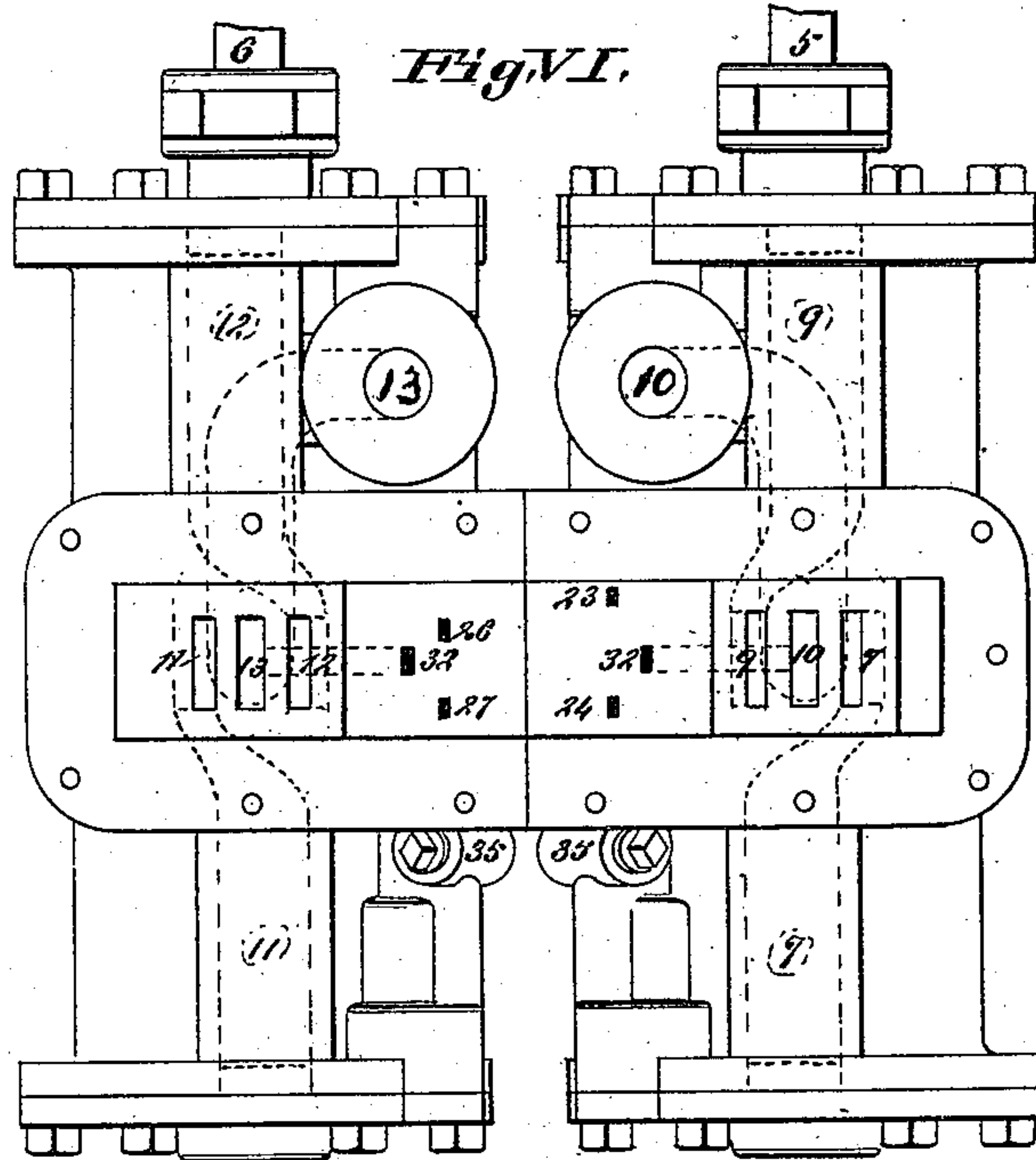
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

FRANK STEINMANN, OF ST. LOUIS, MISSOURI.

## ENGINE.

SPECIFICATION forming part of Letters Patent No. 420,839, dated February 4, 1890.

Application filed March 20, 1889. Serial No. 303,970. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK STEINMANN, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure I is a transverse section of my improved engine, taken on line II, Fig. II. Fig. II is a horizontal section taken on line II II, Fig. I. Fig. III is a detail transverse section taken on line III III, Fig. II. Fig. IV is a transverse section taken on line IV IV, Fig. II. Fig. V is an end view of one of the cylinders with the head removed. Fig. VI is a top view with the housing and valves of the steam-chest removed. Fig. VII is a section taken on line VII VII, Fig. I.

My invention relates to certain improvements in engines; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claim.

Referring to the drawings, 1 2 represent cylinders. The cylinder 1 is provided with a piston 3 and the cylinder 2 with a piston 4. The piston 3 has a rod 5 and the piston 4 a rod 6. The cylinder 1 is provided with a port 7, that extends from a steam-chest 8 to one end of the cylinder, as shown by dotted lines at the lower right-hand side of Fig. VI. It is provided also with another port 9, which extends from the chest to the other end of the cylinder, as shown on the upper right-hand side of Fig. VI. It is also provided with an exhaust-port 10. The cylinder 2 is provided with a port 11, that extends from the chest to the end of the cylinder, as shown on the lower left-hand side of Fig. VI, and another port 12, which extends from the chest to the other end of the cylinder, as shown on the upper left-hand side of Fig. VI. It has also an exhaust-port 15. The cylinder 1 has a steam-chest 8, as stated, and the cylinder 2 a steam-chest 8½. In the chest 8 is a valve 16, and in the chest 8½ is a valve 17. These valves control the ports of the respective chests, and are connected by a rod 18, on which is a piston 19, located in the chamber 20 between the

steam-chests. The steam-pipe from the boiler connects with the respective chests through means of ports 21 and 22. (See Fig. I.)

23 represents a port leading from one end of the cylinder 1 to the chamber 20, as shown by the dotted lines in Fig. I. It communicates with the chamber 20 on the left-hand side of the piston 19. (See Fig. I.) A like port 24 extends from the other end of the cylinder 1 to the chamber 20, and this port (as shown at 25, Fig. II,) connects with the chamber 20 on the right-hand side of the piston.

26 represents a port leading from one end of the cylinder 2 to the chamber 20, and, as shown by dotted lines, this port leads to the right-hand side of the chamber.

27 represents a port leading from the other end of the cylinder 2 to the chamber 20, and, as shown by the dotted lines 28, Fig. II, it connects with the chamber on the left-hand side of the piston.

The ports 23, 24, 26, and 27 are all controlled by valves 29. Each valve 29 has a disk or projection 30, located in a chamber 30<sup>a</sup>, closed against the external atmosphere, but having an open side, through which the disk or projection 30 extends into its cylinder. These disks are impinged by the respective pistons 3 4 as the pistons reach the limit of their movements, and this opens the ports controlled by the valves. When the pistons leave the disks, the valves move back automatically under the force of springs 31, located in said chambers 30<sup>a</sup>, and close the ports.

32 represents exhaust-ports leading from the opposite ends of the chamber 20 and communicating with the exhaust-ports 10 and 13 of the respective cylinders. These ports are made in the lower portions of the heads of the chamber 20 from the rod 18 downward. The rod 18 is notched at 33, as shown, and when these notches coincide or are over the upper ends of the exhaust-ports a communication between the chamber and the ports is made, as shown in the right-hand side of Fig. I.

35 represents valves located in the ports 23, 24, 26, and 27, by which the ports may be closed.

It is evident that instead of making the

device double, as described, a single cylinder, with its parts, might be constructed on the same principle.

5 The operation of the engine will be readily understood from the description given; but it may be briefly stated that when the pistons reach the limit of their movements they impinge against the disks 30 of the valves 29, thus opening the ports of these valves and  
10 allowing steam to pass, as described, into the chamber 20, which moves the valves 16 and 17, through means of the piston 9, to open and close the ports of the steam-chests leading to the respective cylinders.

15 I claim as my invention—

The combination of two cylinders, a double steam-chest having ports leading from the respective ends of the cylinders to the respective ends of the steam-chest, valves located in the chest, a rod connecting the valves, a piston secured to the valves and located in the steam-chamber, ports leading from the chamber to the ends of the cylinders, valves in said ports, and disks on said valves extending into the cylinders, substantially as and  
20 for the purpose set forth. 25

FRANK STEINMANN.

In presence of—

EDW. S. KNIGHT,  
THOMAS KNIGHT.