

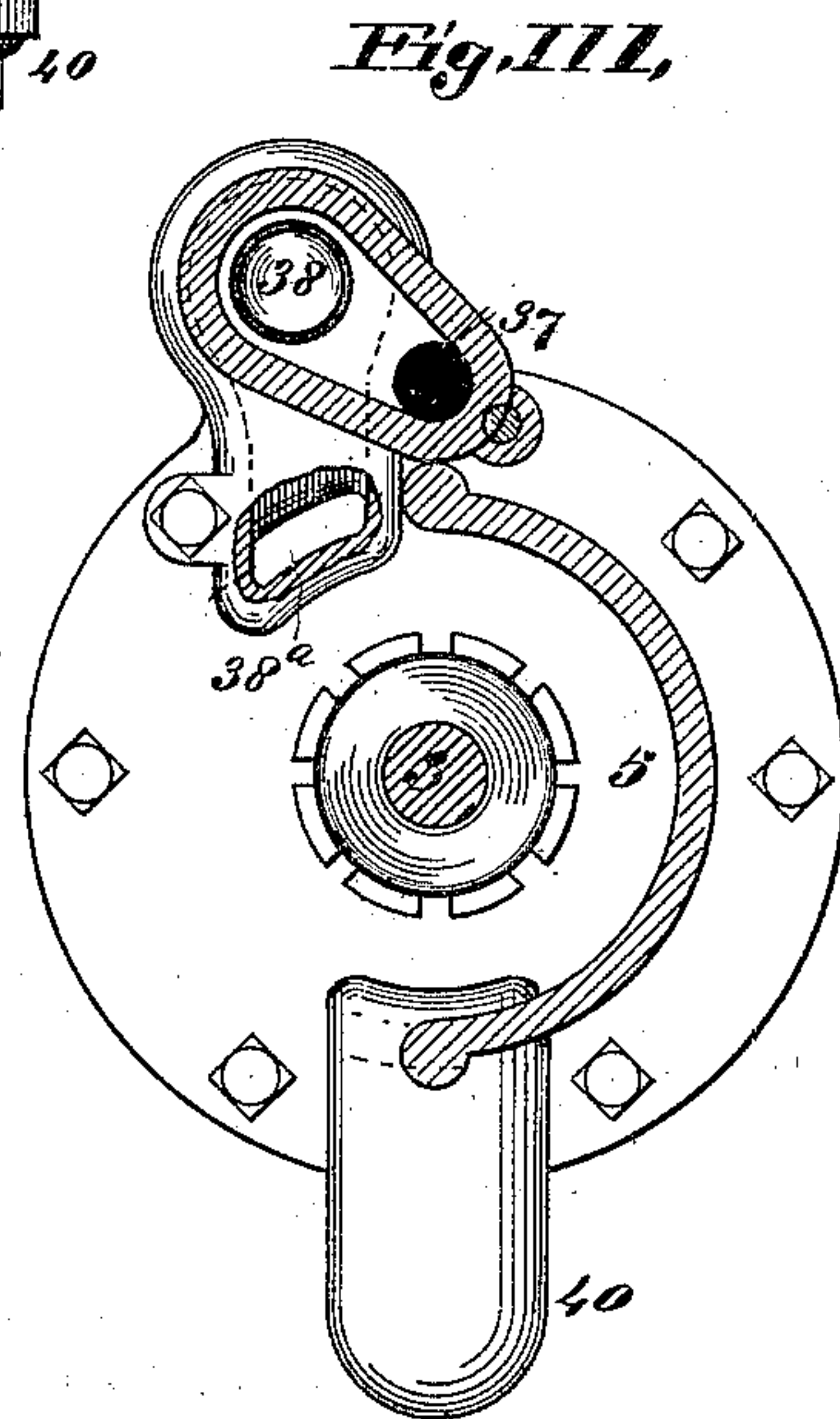
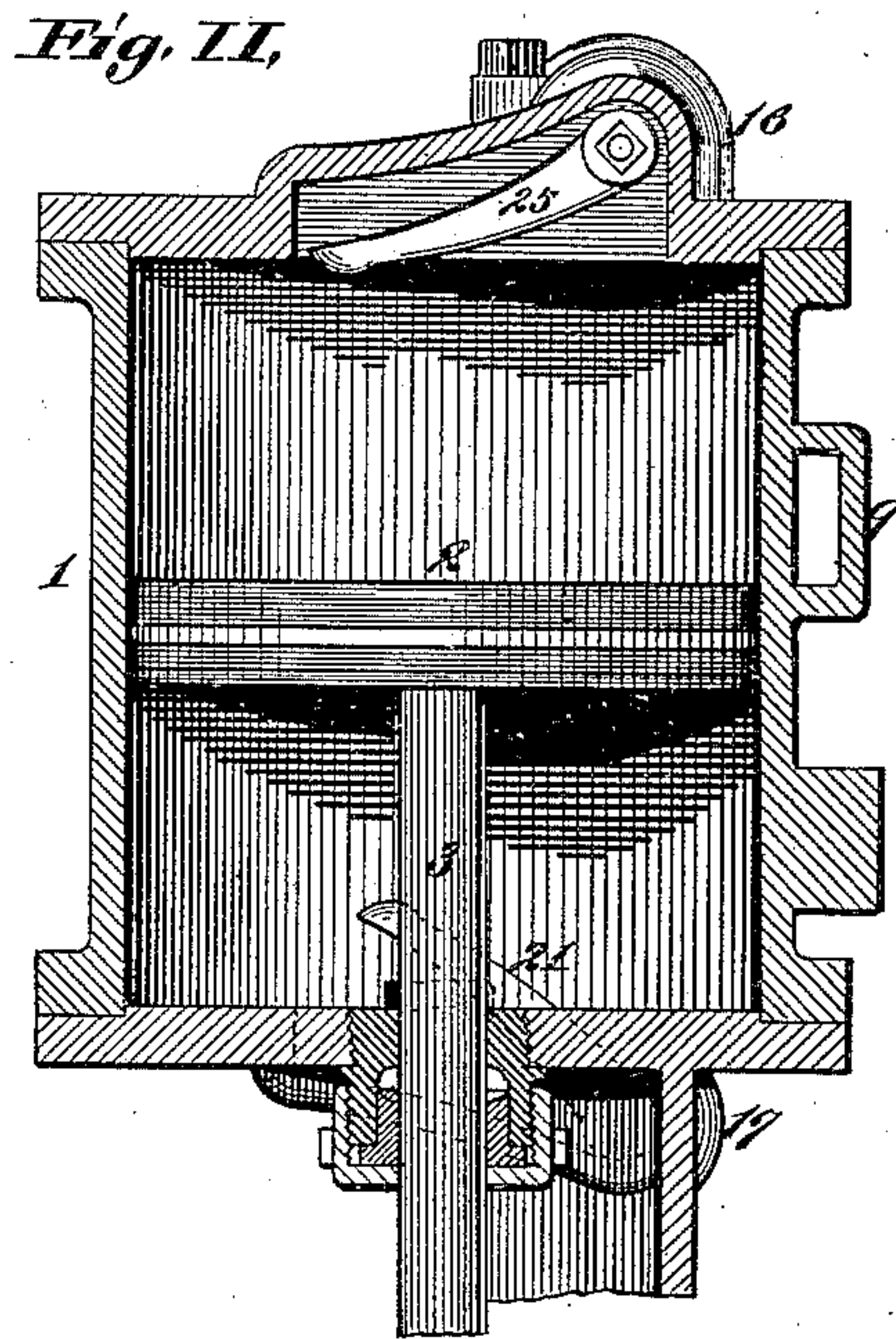
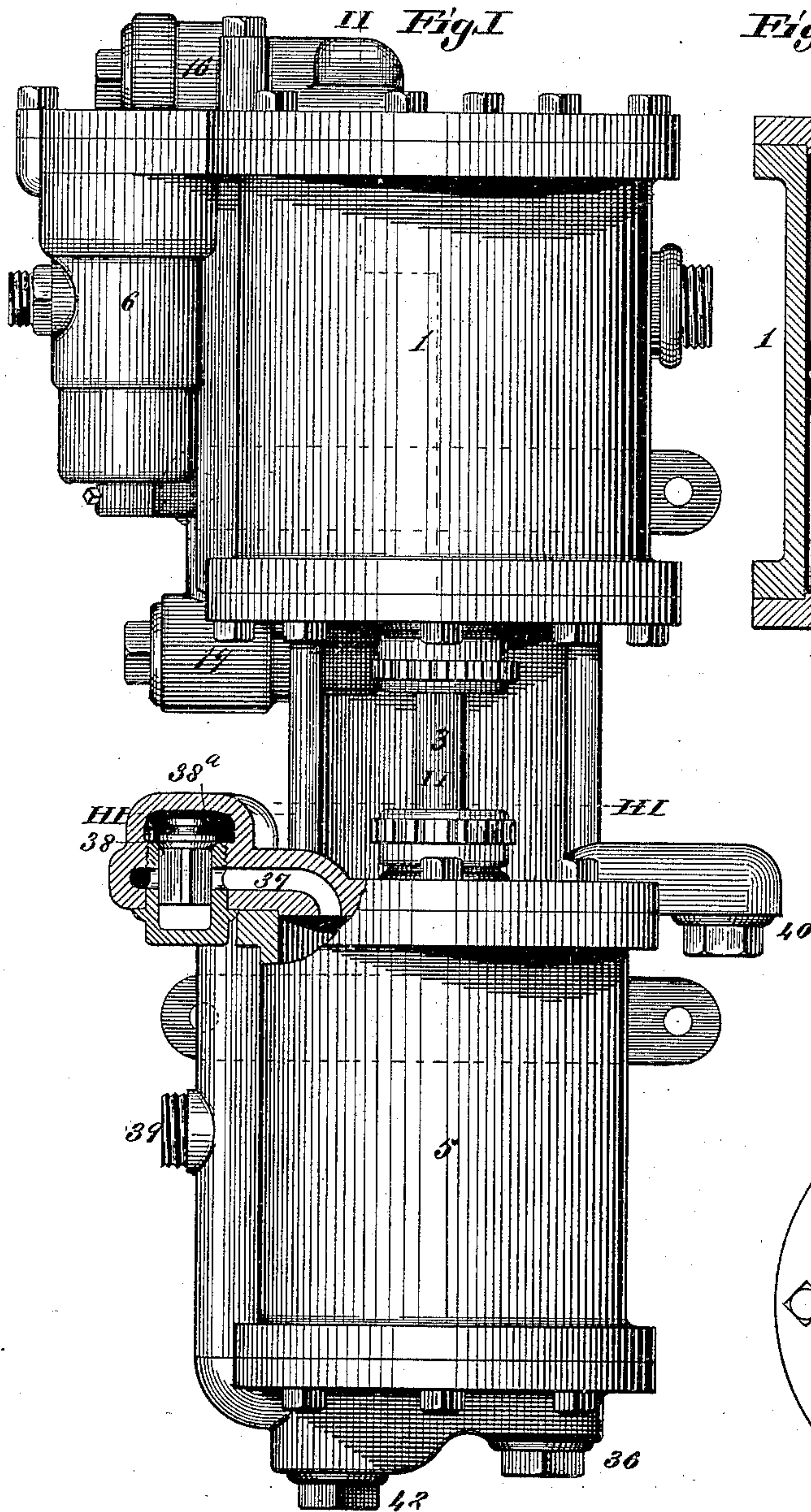
(No Model.)

3 Sheets—Sheet 1.

F. LANSBERG.  
STEAM PUMPING ENGINE.

No. 415,520.

Patented Nov. 19, 1889.



Attest:  
Charles Pickles,  
Samuel H. Knight

Inventor:  
Frank Lansberg  
By Knight Bros  
attys

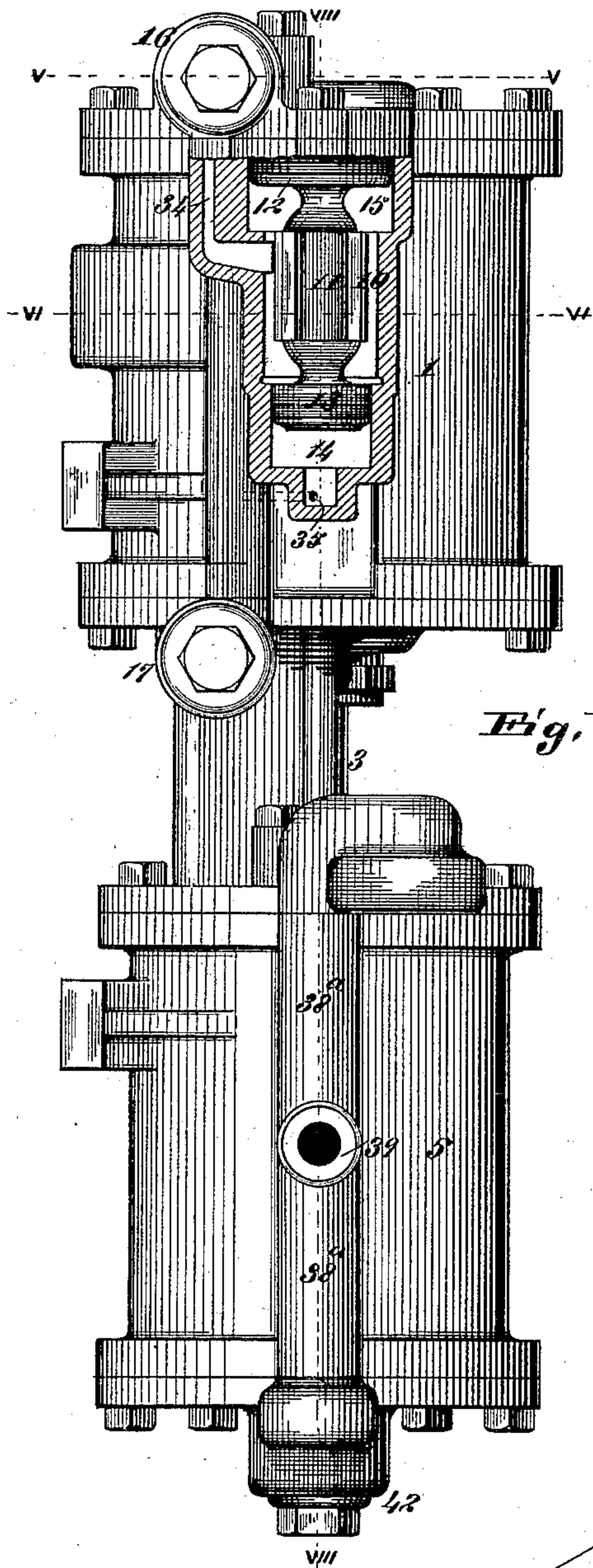


3 Sheets—Sheet 2.

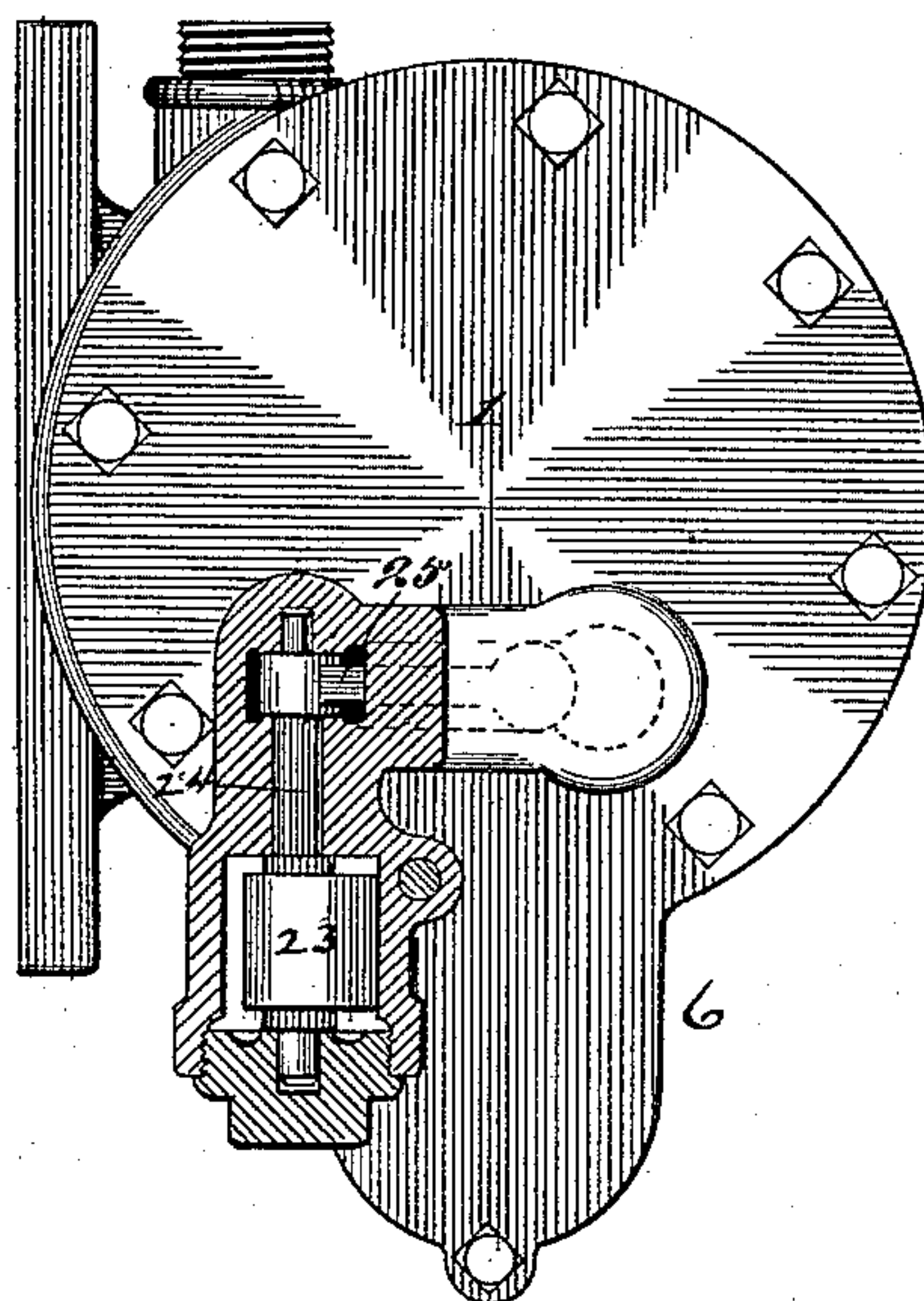
No. 415,520.

Patented Nov. 19, 1889.

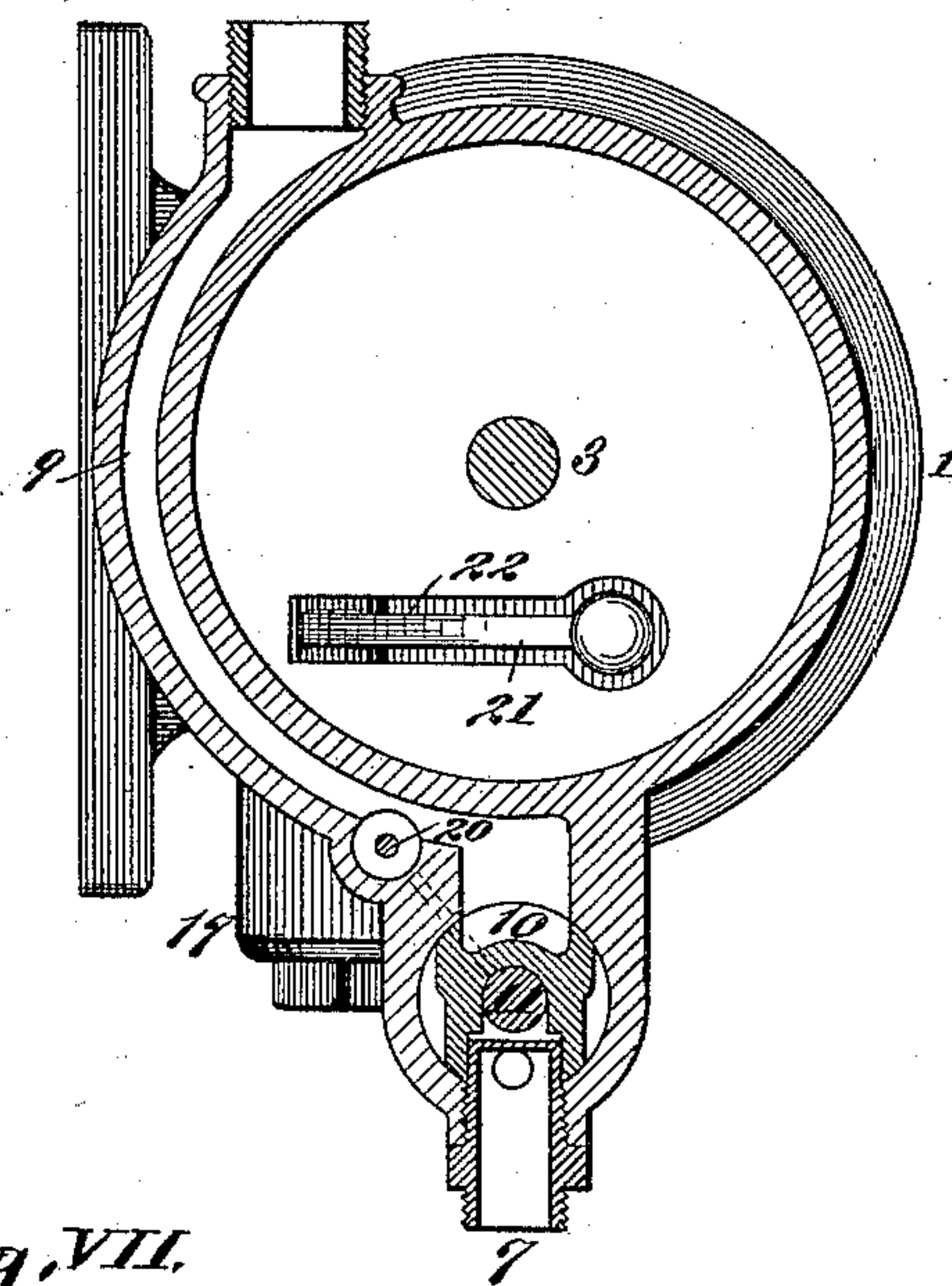
*Fig. IV.*



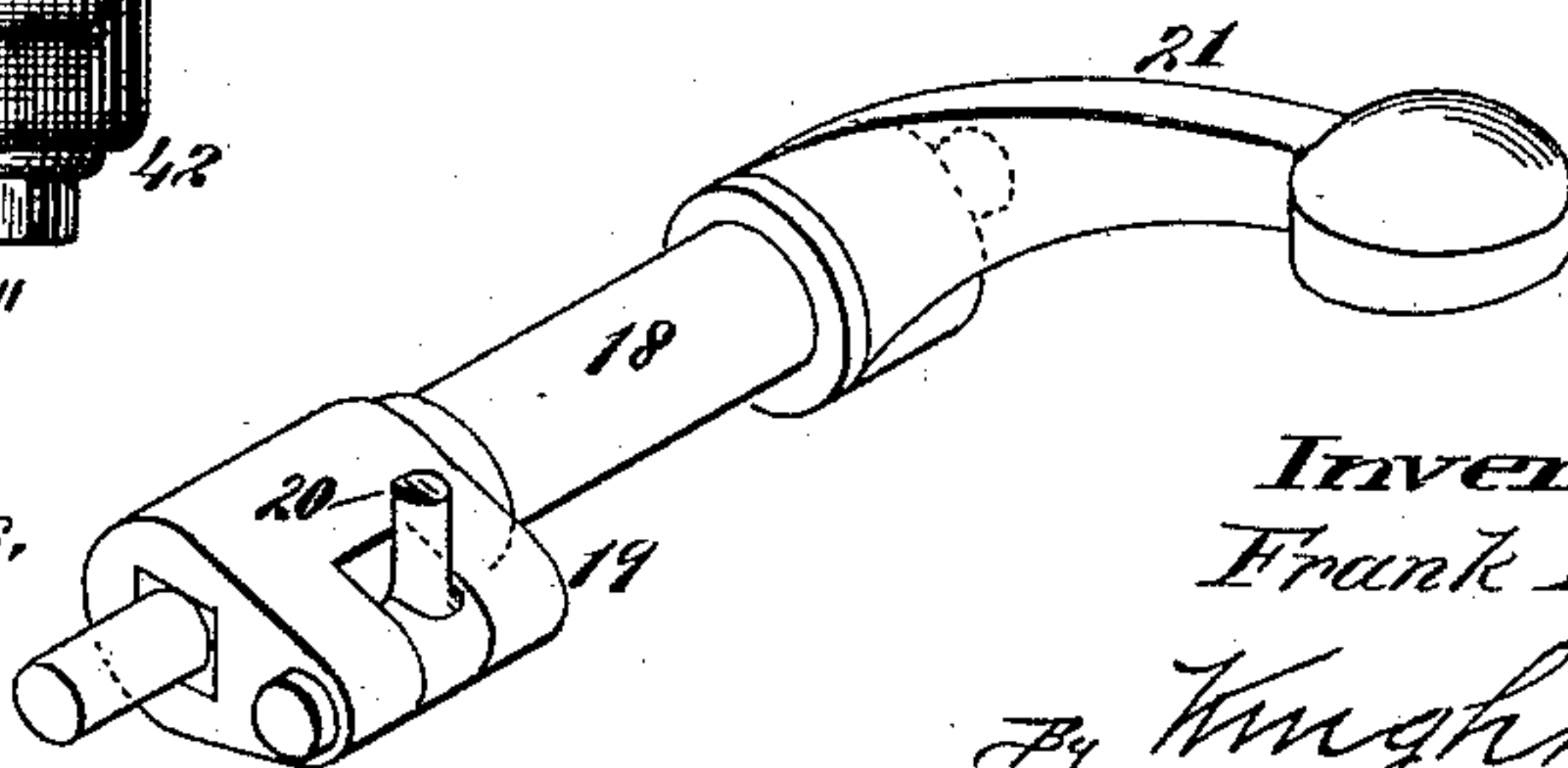
*Fig. V.*



*Fig. VI.*



*Fig. VII.*



Attest:  
Charles Pickles,  
Samuel Knight.

*Inventor;*  
*Frank Lansberg*

By Knight Bros

Atty's



(No Model.)

3 Sheets—Sheet 3.

F. LANSBERG.  
STEAM PUMPING ENGINE.

No. 415,520.

Patented Nov. 19, 1889.

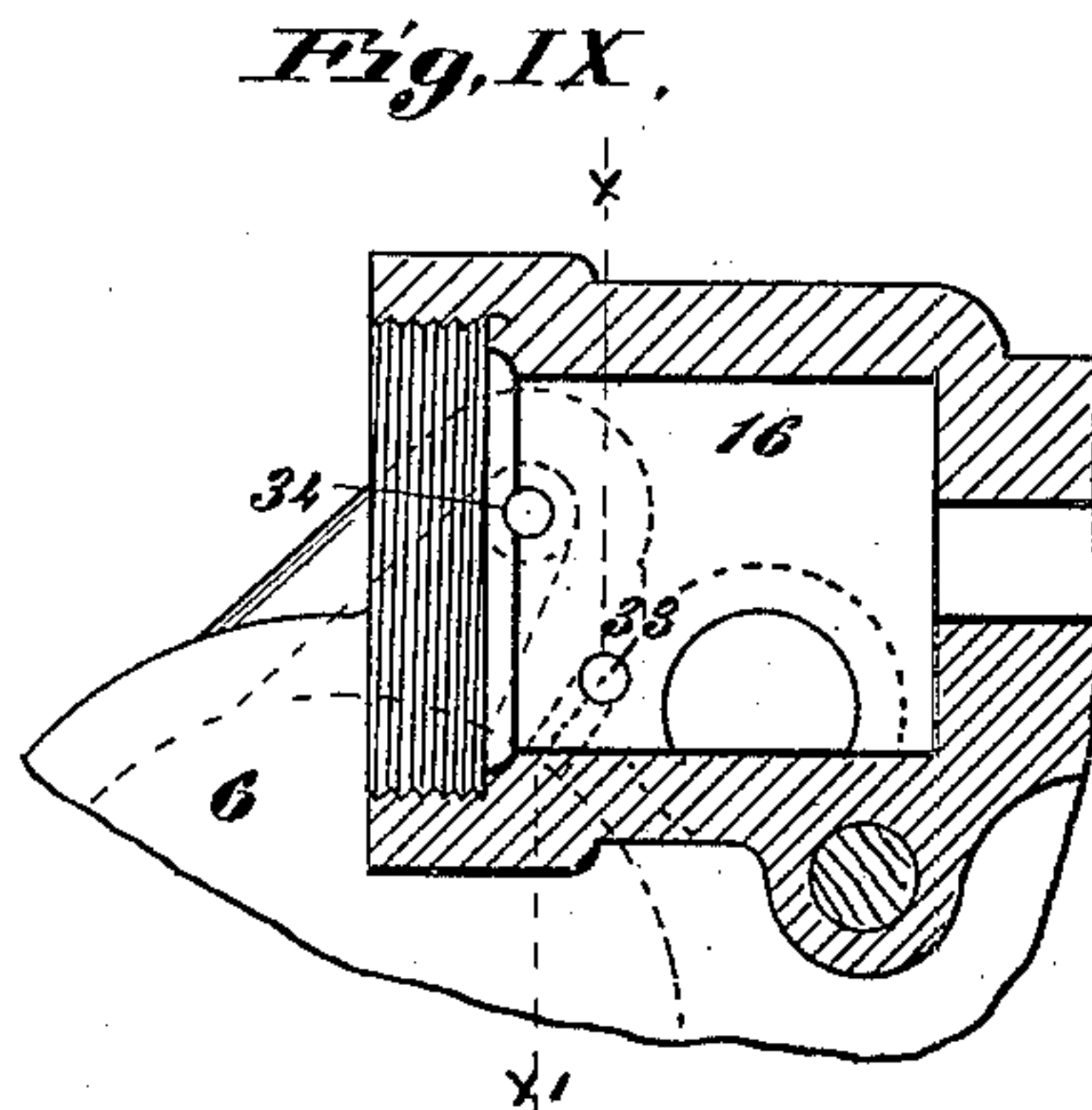
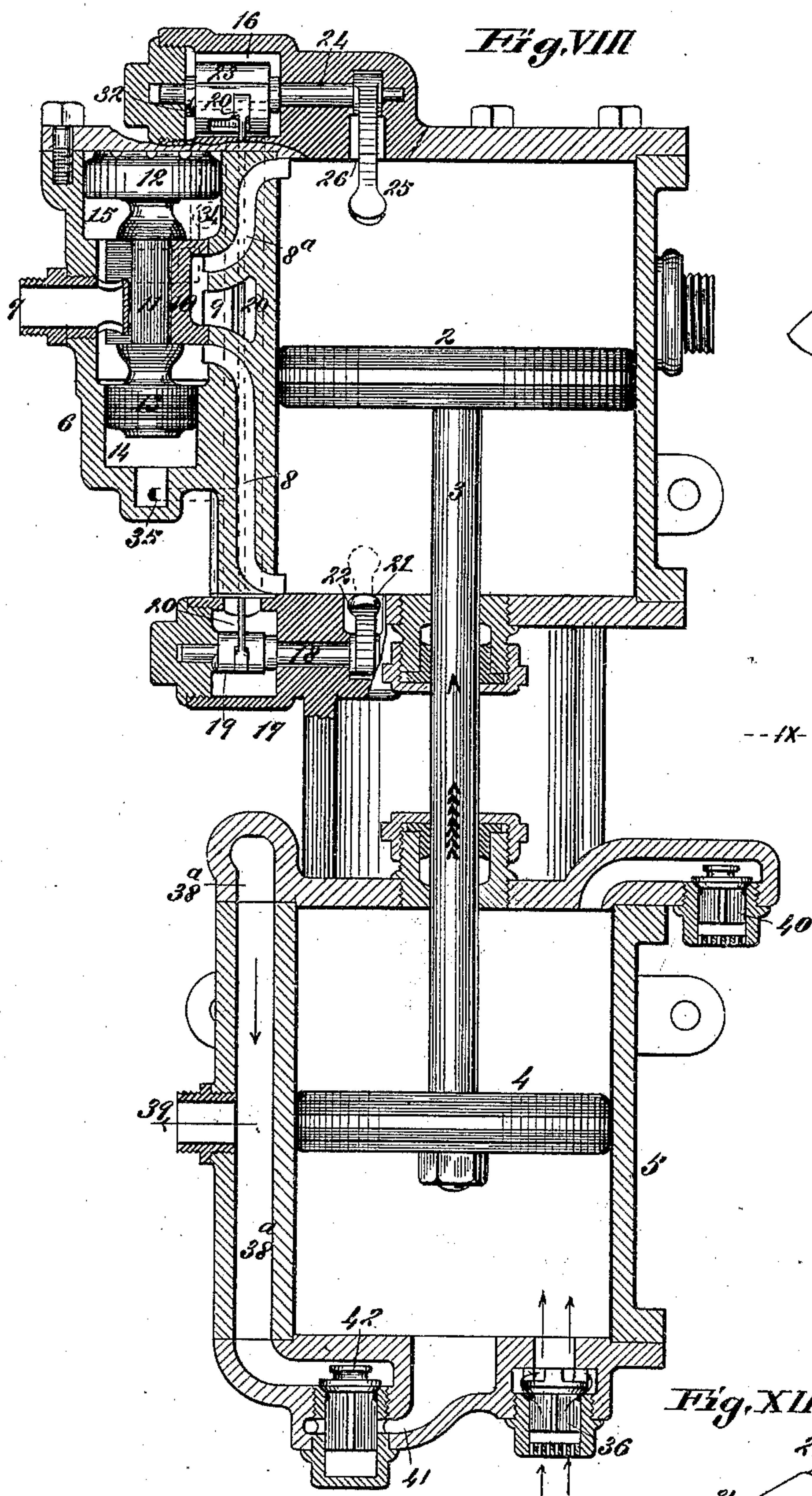


Fig. X.

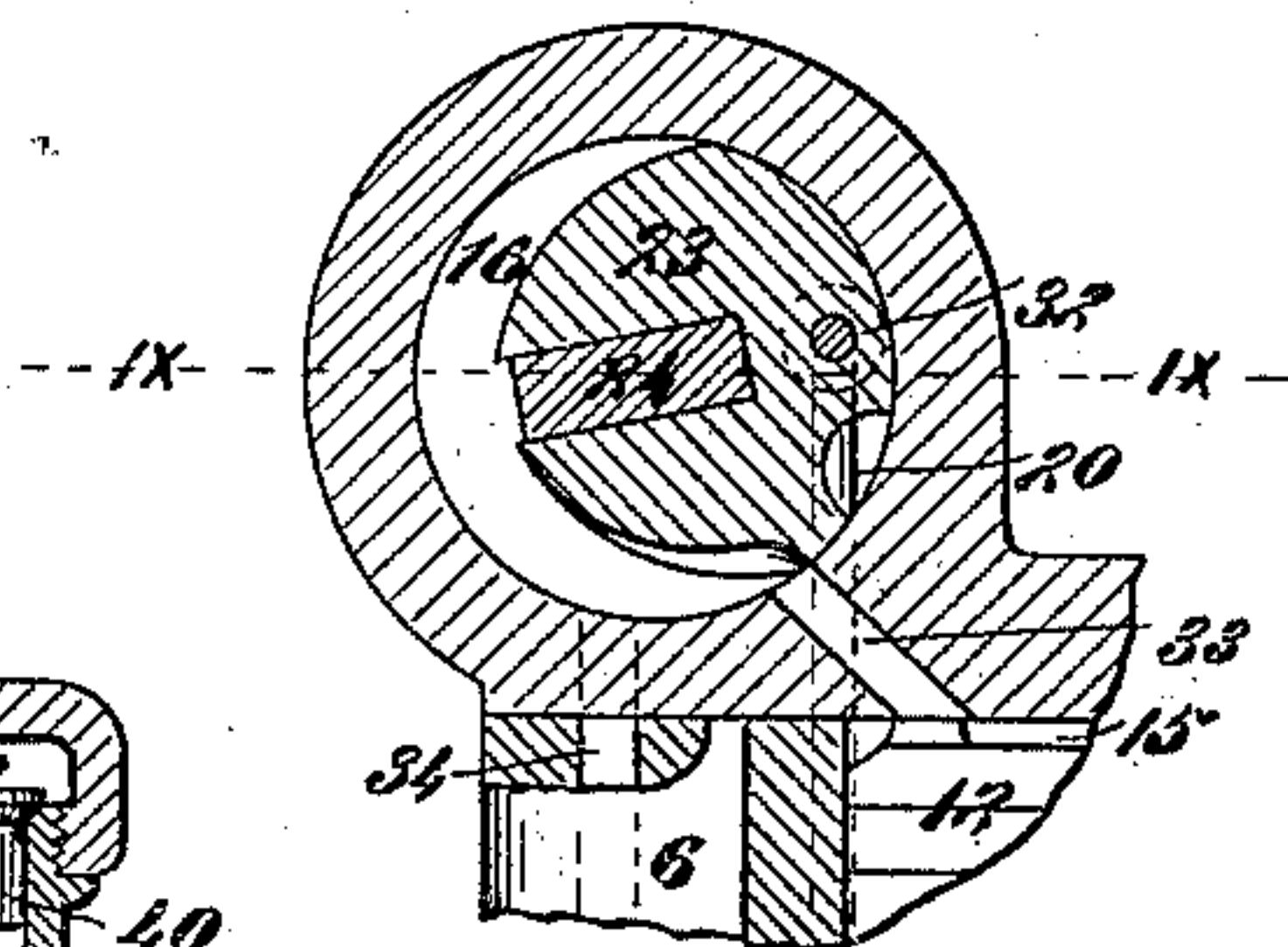


Fig. XII.

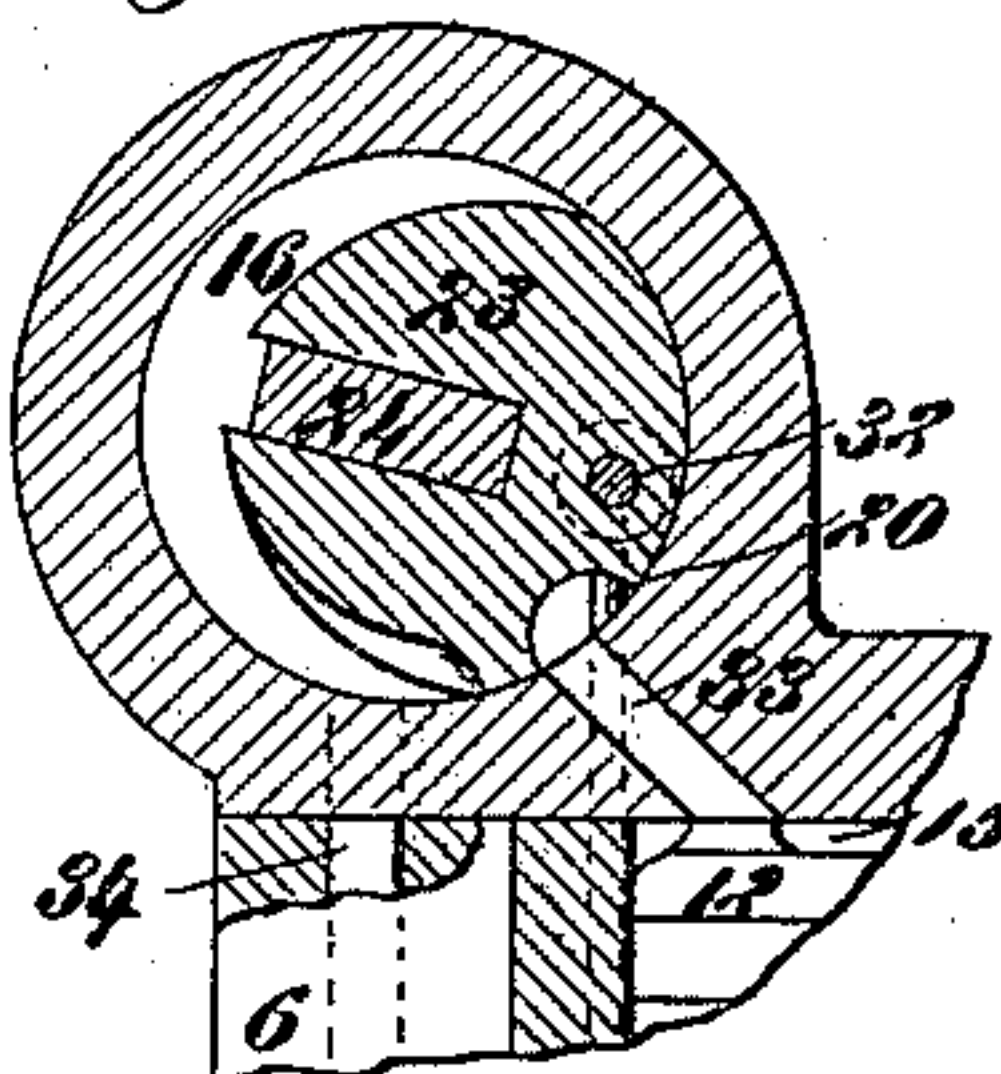
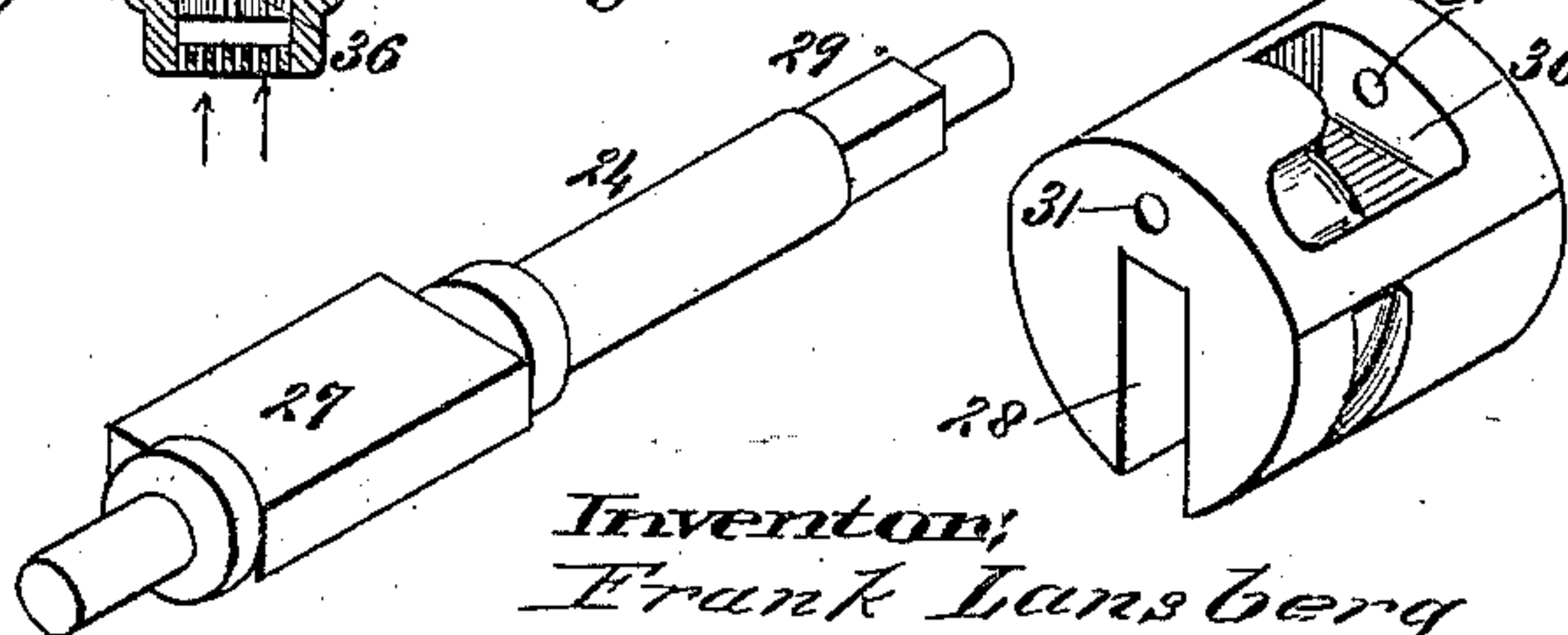


Fig. XIV.



Attest:  
Charles Pickles,  
Samuel H. Knight.

Inventor,  
Frank Lansberg  
By *Knight Bros*  
Attys



# UNITED STATES PATENT OFFICE.

FRANK LANSBERG, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE LANSBERG BRAKE COMPANY, OF EAST ST. LOUIS, ILLINOIS.

## STEAM PUMPING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 415,520, dated November 19, 1889.

Application filed April 29, 1889. Serial No. 308,938. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK LANSBERG, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Steam Pumping-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 front elevation, part in section, of my improved engine, shown in connection with a pump. Fig. II is a detail vertical section taken on line II II, Fig. I. Fig. III is a transverse section taken on line III III, Fig. I. Fig. IV is a side elevation, part in section. Fig. V is part in end view and part in section taken on line V V, Fig. IV. Fig. VI is a transverse section, taken on line VI VI, Fig. IV. Fig. VII is a perspective view of the rock-shaft and tappet for operating the valve admitting steam to the chest. Fig. VIII is a longitudinal section taken on line VIII VIII, Fig. IV. Fig. IX is an enlarged detail section taken on line IX IX, Fig. X, and showing the cylinder of the valve for admitting steam into the chest. Figs. X and XI are sections taken on line X XI, Fig. IX, showing the valve in different positions. Fig. XII is a perspective view of the stem of the valve for admitting steam into the chest, and Fig. XIII is a perspective view of the valve.

My invention relates to certain improvements in steam pumping-engines, intended more particularly for use in compressing air for use in air-brakes for railway-cars, but which may be used for other purposes; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, 1 represents the steam-cylinder, and 2 its piston, connected by means of a rod 3 to a piston 4, located in the air-cylinder 5.

6 represents the chest of the steam-cylinder, and 7 the steam-supply pipe.

8 8<sup>a</sup> represent the ports forming communication between the chest 6 and the respective ends of the cylinder 1, and 9 represents the exhaust-port.

10 represents the valve of the steam-chest.

It is secured to the stem 11 of pistons 12 and 13, located, respectively, in the ends 14 and 15 of the chest. The diameter of the piston 12 is considerably in excess of that of the piston 13.

16 represents an auxiliary cylinder located at one end of the cylinder 1.

17 represents a housing, through which a shaft 18 passes, and in which is located on the shaft a crank or arm 19, (see Figs. VII and VIII,) to which is connected one end of a rod 20. On the shaft 18 is a tappet-arm 21, fitting in a recess 22, made in the end of the cylinder 1, and which may protrude into the cylinder, as shown by dotted lines in Fig. VIII.

In the cylinder 16 there is located an auxiliary valve 23. This valve is secured to a stem 24, extending into the head of the cylinder, and to which is secured a tappet-arm 25, fitting in a recess 26 in this head of the cylinder 1, and which may protrude into the cylinder. The stem 24 is secured to the valve 23 by having an enlargement 27 fitting in a groove 28 of the valve, as shown in Figs. XII and XIII. The stem has a non-circular portion 29 to receive the tappet-arm 25. It will thus be seen that when the tappet is moved the stem 24, with its valve 23, will be turned. To this valve 23 is connected one end of the rod 20, as shown in Fig. VIII, the valve, as shown in Fig. XIII, being provided with a recess 30 in its periphery to receive the head of the rod, and being perforated at 31 to receive a pin that passes through the rod. The pin is shown at 32, Fig. VIII. It is also shown in section in Figs. X and XI.

The valve 23 controls a port 33, which forms a communication between the cylinder 16 and the chamber 15 of the steam-chest.

The operation is this: When the piston 2 is moving in the direction indicated by the arrow in Fig. VIII, the port 33 is closed by the valve 23. As the piston reaches the limit of this movement it strikes the tappet 25, and, rotating the shaft 24, operates the valve 23 and opens the port 33. This admits steam (I should have stated that the cylinder 16 is always in communication with the central part of the steam-chest 6 through means of a port 34, so that it is always kept charged with live



steam) into the chamber 15 and moves the pistons 12 and 13, together with the valve 10, from the position shown in Fig. VIII, and in doing so closes the port 8 of the cylinder 1 and opens the port 8<sup>a</sup>. This causes the piston 2 to move in the other direction. When the tappet-arm 25 was moved to turn the pin 24 and the valve 23, the tappet-arm 21 was moved through means of the connecting-rod 20 from the position shown in full lines, Fig. VIII, to the position shown in dotted lines, or moved to throw its free end into the cylinder. When the piston about reaches the limit of its throw in the direction it is now moving, it strikes the tappet-arm 21, and, through means of the connecting-rod 20, operates the valve 23 and moves the tappet-arm 25 into the cylinder 1 again, and as it does so closes the port 33. The valve 10 will now be moved in the other direction from that last stated by the area or diameter of the piston 12 being in excess of that of the piston 13, and as it does so the port 8<sup>a</sup> will be closed and the port 8 opened, and the piston 2 will then move again in the direction indicated by the arrow in Fig. VIII.

35 represents the exhaust-port of the chamber 14, and the chamber 15 is provided with a similar port.

As the piston 4 moves in the direction indicated by the arrow in Fig. VIII the air enters the cylinder 5 through a valve 36 and escapes through a port 37, (see Fig. I,) provided with a valve 38. (See Fig. I.) Beyond the valve 38 (see Fig. VIII) is a port 38<sup>a</sup>, communicating with a pipe 39, leading to the receiver. As the piston moves in the other direction the air enters through a valve 40 and escapes through a port 41, having a valve 42 and communicating with the port 38<sup>a</sup>. By arranging the ports as I have them the valves

may be so placed that they can be readily reached and removed for repairs.

In this specification I have fully shown and described my improved engine in connection with a pump, but have not claimed the latter herein, as the same forms the subject-matter of my application, Serial No. 319,285, filed July 31, 1889.

I claim as my invention—

1. The combination of the main steam-cylinder, an auxiliary cylinder, a valve in said auxiliary cylinder, a rock-shaft provided with a crank-arm, a longitudinally-movable rod connecting the arm to the auxiliary valve, and tappet-arms secured to said valve and said shaft, respectively, a steam-chest, and a valve located in the chest, substantially as and for the purpose set forth.

2. The combination of the steam-cylinder provided with a chest having a valve, pistons secured to the valve and of different areas, an auxiliary cylinder communicating with the steam-chest and provided with a valve having a tappet-arm, and a rock-shaft provided with a tappet-arm, substantially as and for the purpose set forth.

3. The combination of the steam-cylinder having a chest, a valve located in the chest and having pistons of different diameters, an auxiliary cylinder provided with a valve, a tappet-arm secured to the stem of the valve, a rock-shaft located at the other end of the steam-cylinder, a tappet-arm on the shaft, and a rod connecting said shaft with the valve of the auxiliary cylinder, substantially as and for the purpose set forth.

FRANK LANSBERG.

In presence of—

EDW. S. KNIGHT,  
THOMAS KNIGHT.