

No. 646,III.

Patented Mar. 27, 1900.

C. S. TAYLOR.

INJECTOR.

(Application filed Aug. 8, 1899.)

(No Model.)

2 Sheets—Sheet 1.

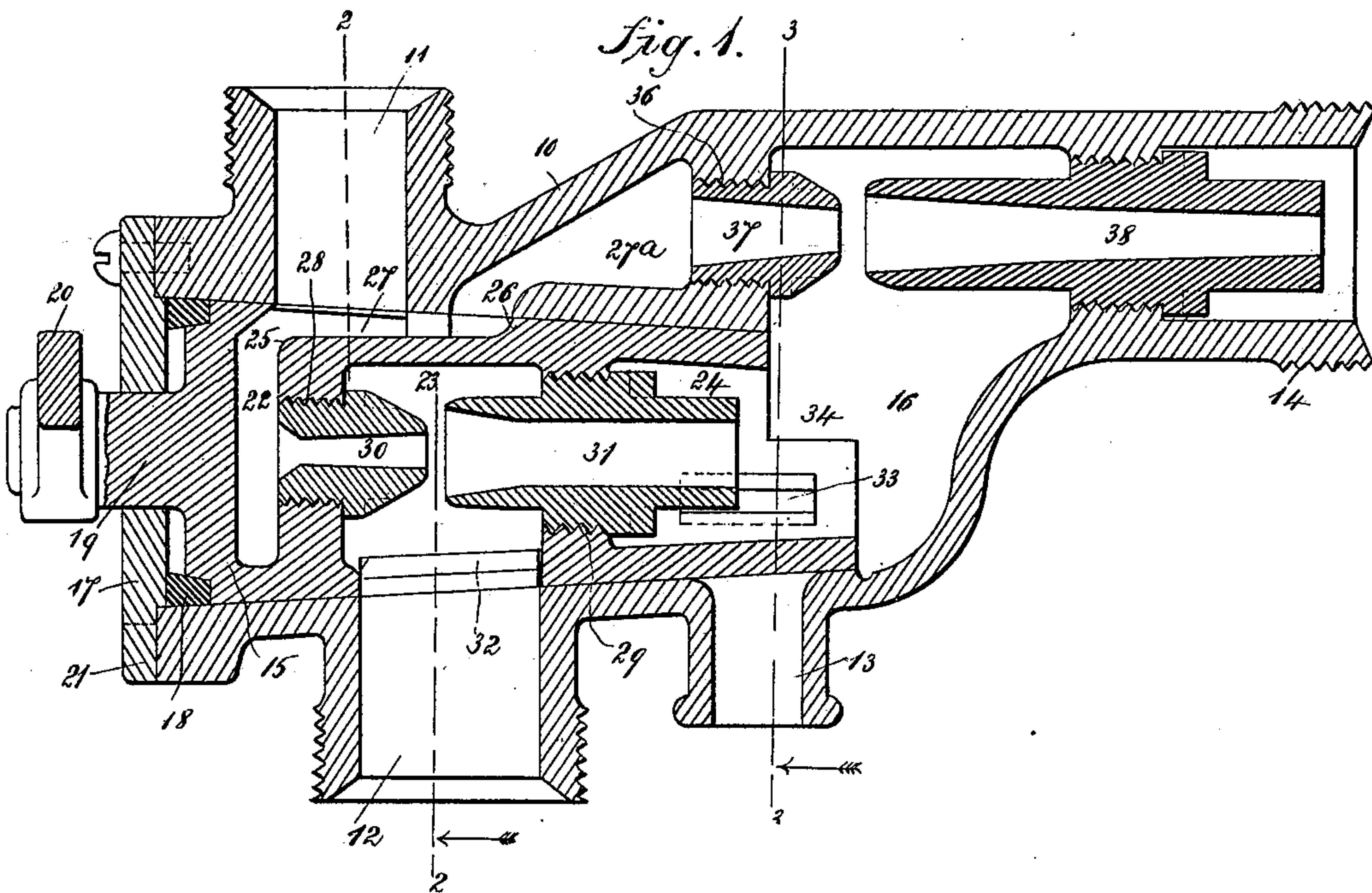
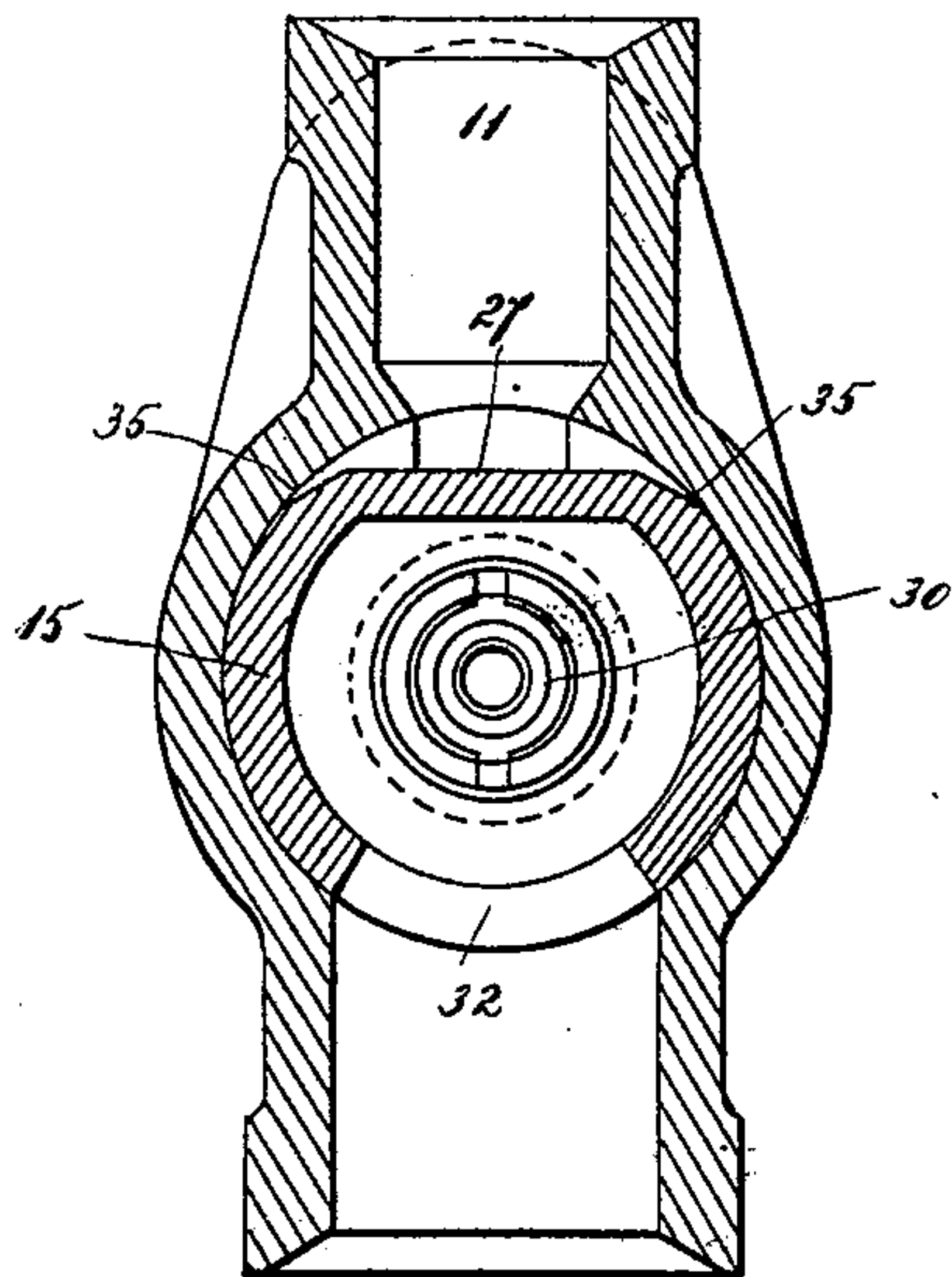


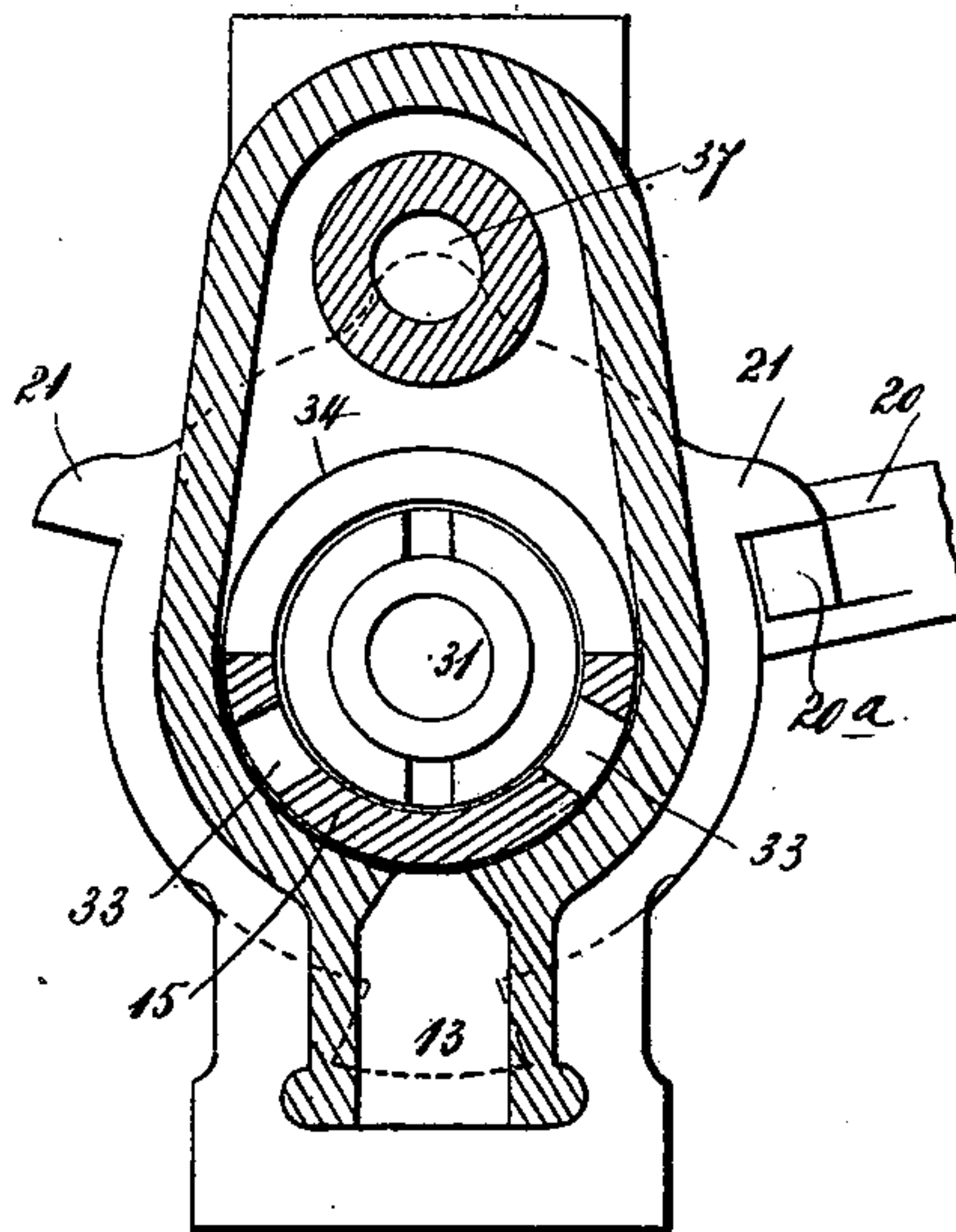
Fig. 2.



WITNESSES

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Fig. 3.



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Fig. 4.

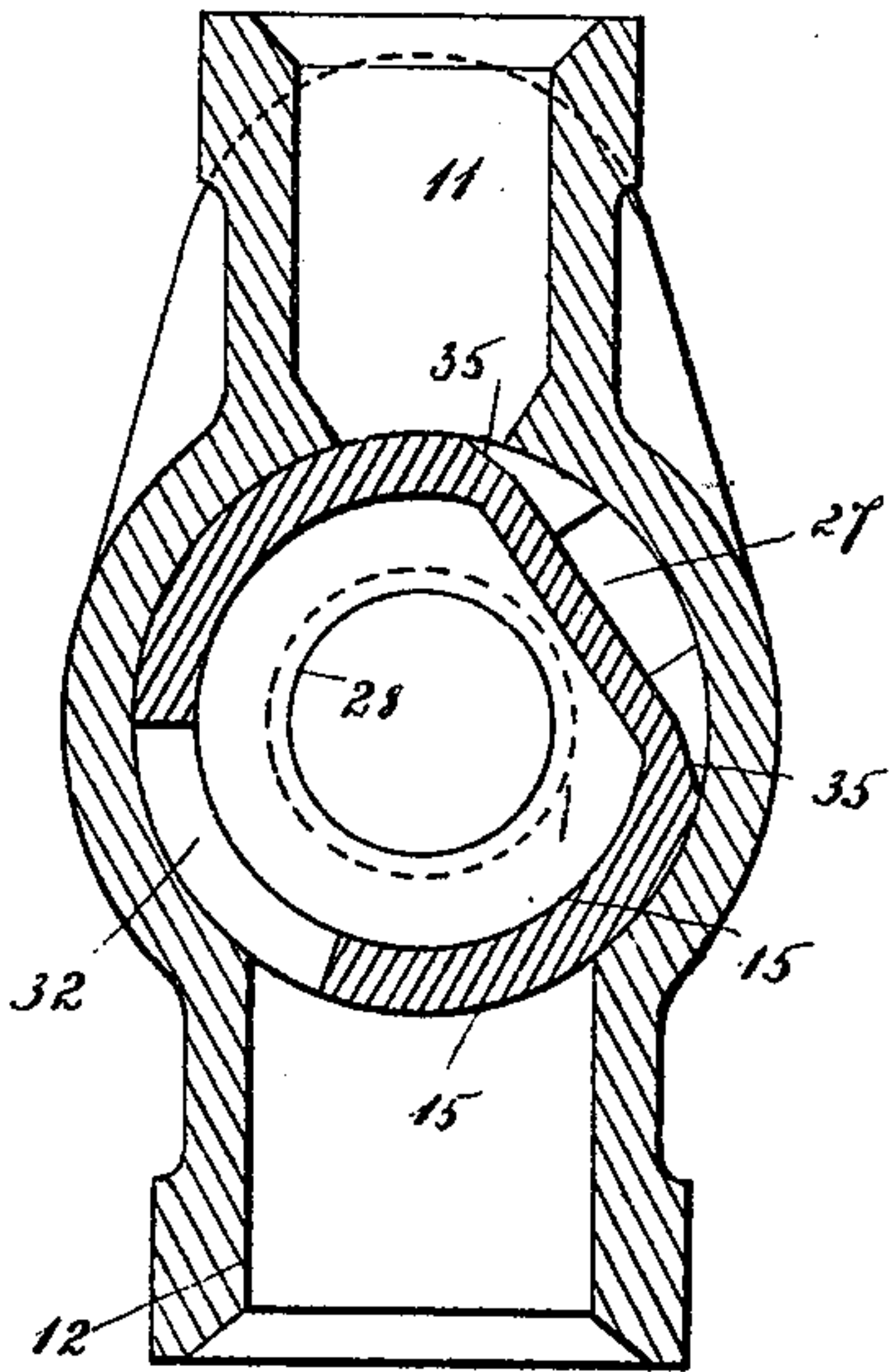


Fig. 5.

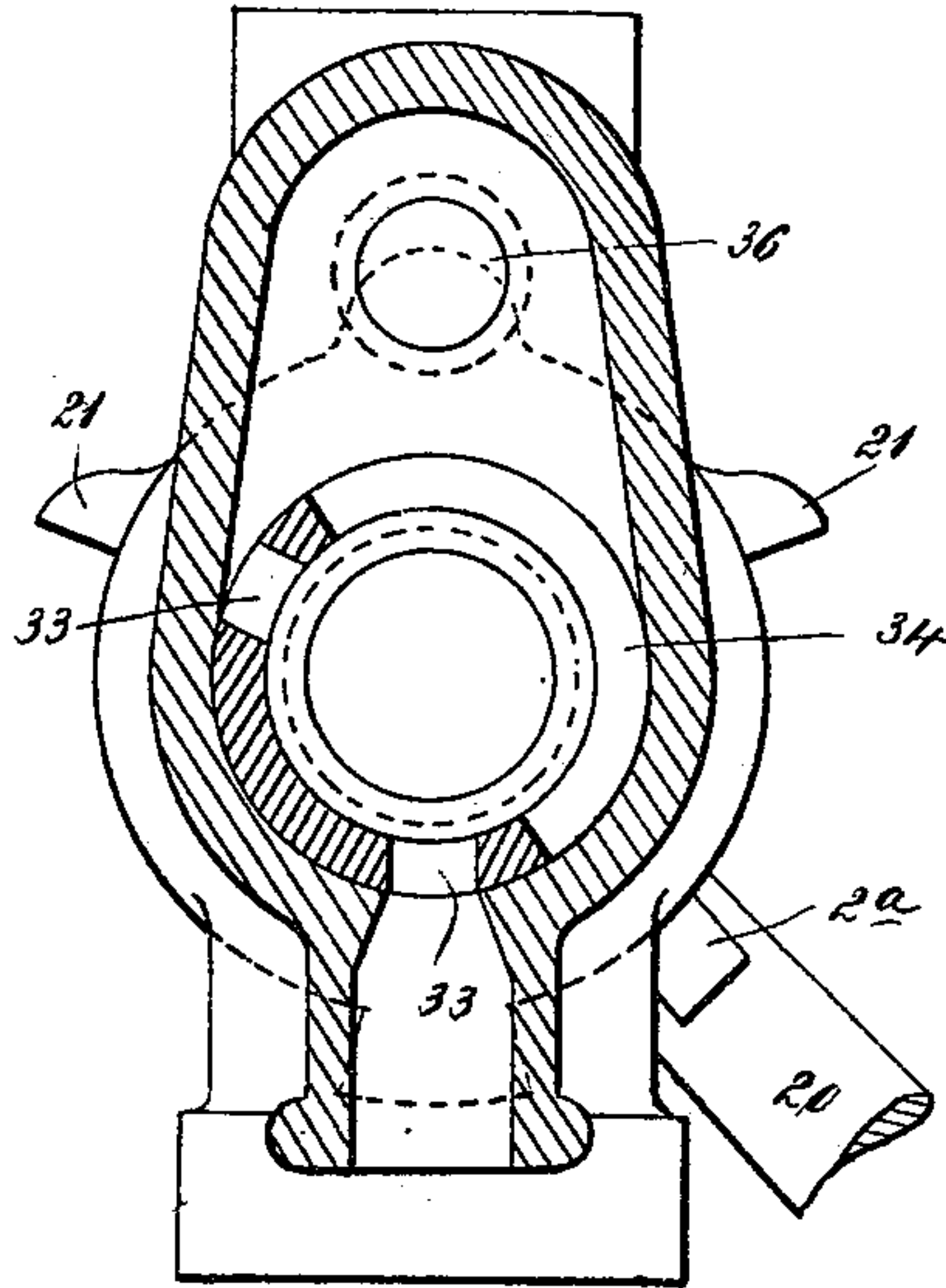


Fig. 6.

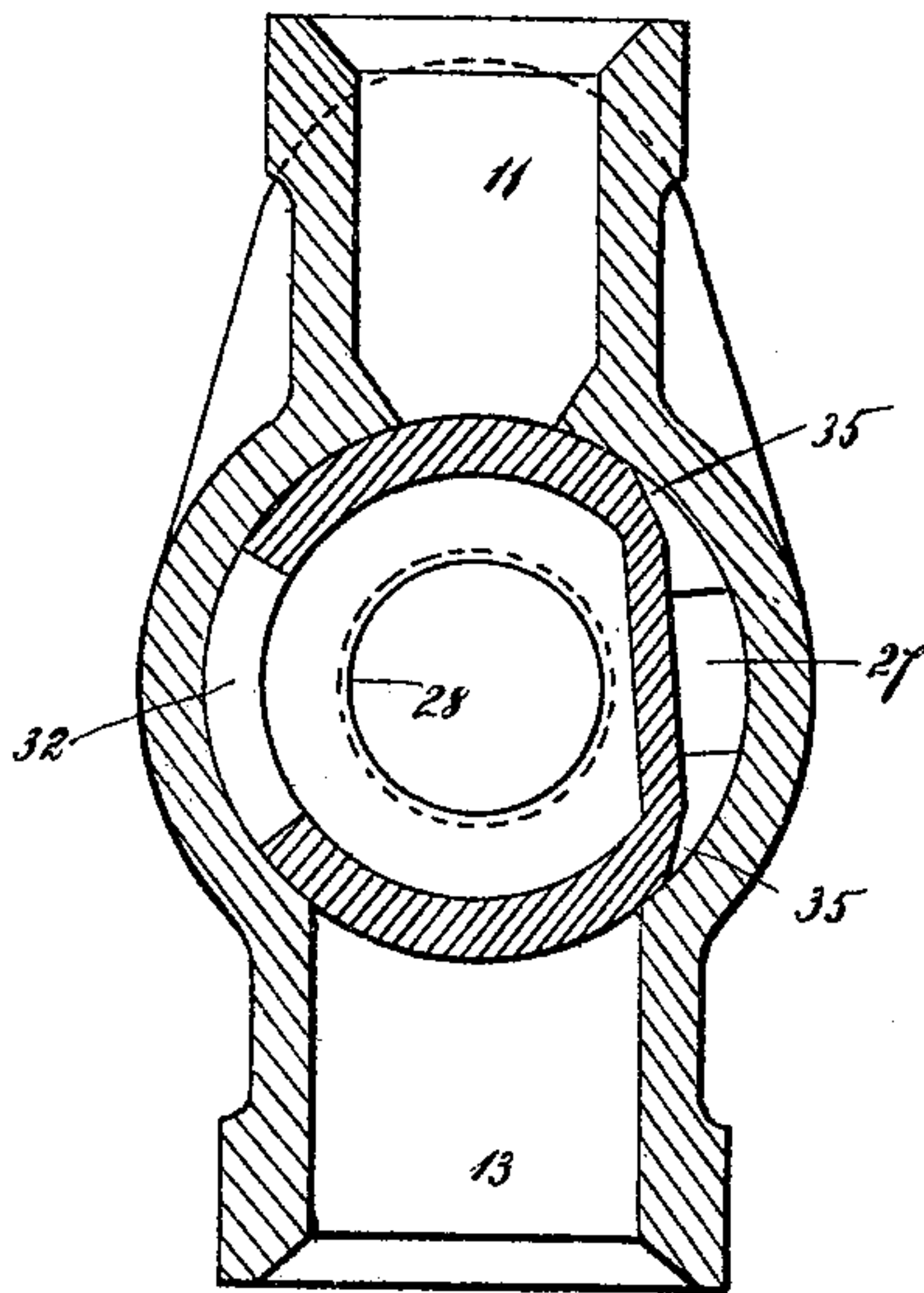
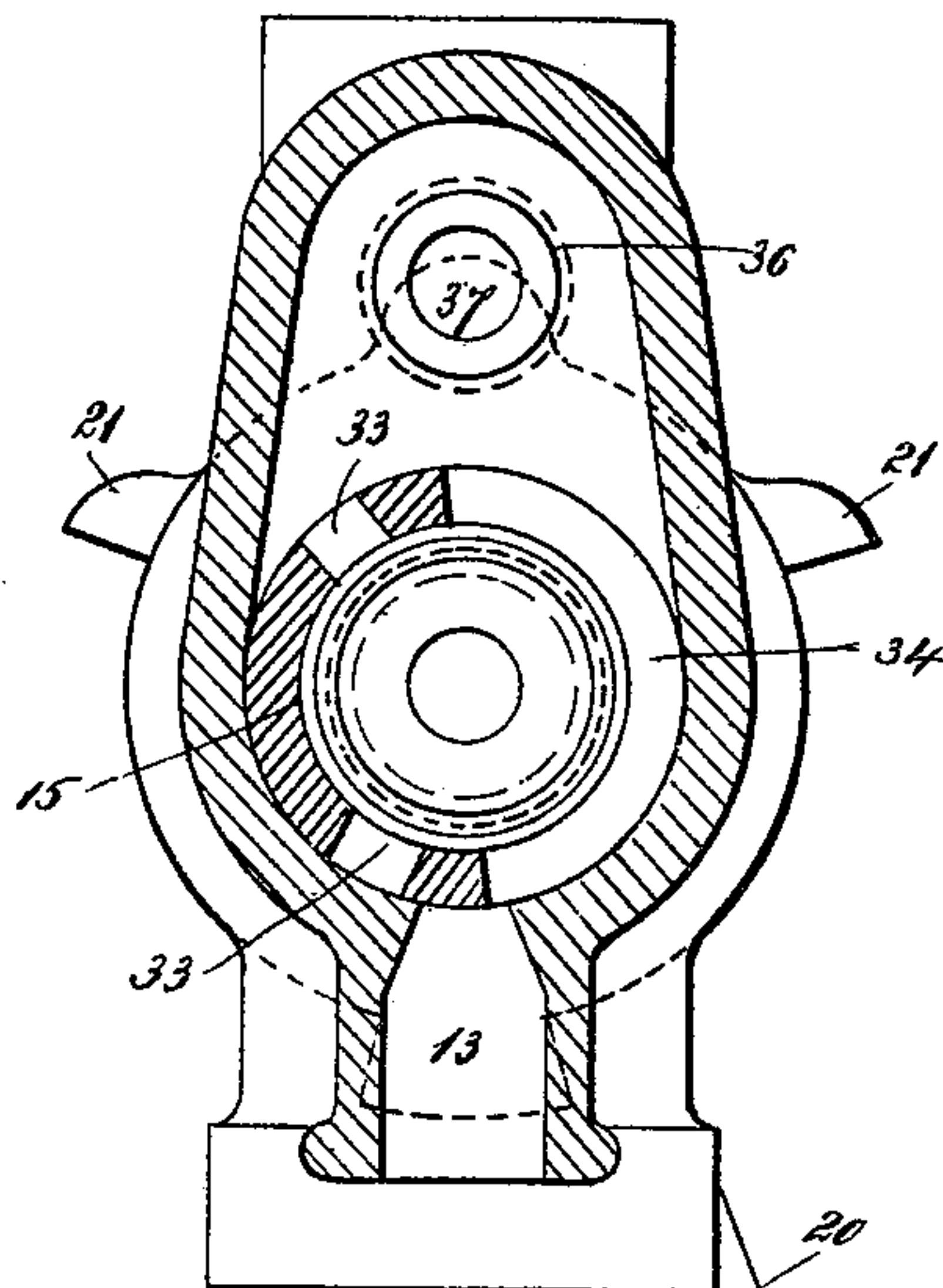


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES S. TAYLOR, OF NEW YORK, N. Y.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 646,111, dated March 27, 1900.

Application filed August 8, 1899. Serial No. 726,520. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. TAYLOR, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Injectors for Steam-Boilers, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to injectors for steam-boilers; and one object thereof is to provide an improved device of this class having a lifting-jet and a forcing-jet and an overflow-passage and in which the admission of steam to both the lifting-jet and forcing-jet and the flow of water are regulated by a single valve, a further object being to provide an injector of this class which is adapted to work either as a right or left hand injector simply by changing the handle of the valve from one side to the other.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a longitudinal vertical section of my improved injector; Fig. 2, a transverse section on the line 2 2 of Fig. 1; Fig. 3, a transverse section on the line 3 3 of Fig. 1; Figs. 4 and 6, sections similar to Fig. 2, showing the valve in different positions; and Figs. 5 and 7, sections similar to Fig. 3, showing the valve in different positions.

In the drawings forming part of this specification the separate parts of my improvement are designated by the same numerals of reference in each of the views, and in the practice of my invention I provide a casing 10, having a steam-inlet 11 in the top thereof and a water-inlet 12 in the bottom thereof, a water-overflow 13, also in the bottom thereof and in line with the water-inlet, and an outlet 14, which is tubular in form and adapted to be connected with the boiler.

The outlet 14 is on a line parallel with but higher than the longitudinal center of the injector, and the main or outer end of the injector is provided with a conical valve-opening in which is placed a hollow conical valve 15, which projects into a chamber 16 between the overflow-passage 13 and the outlet 14.

The valve 15 is held in place by a cap-plate

17, which is secured to the outer end of the injector-casing and between which and said valve is placed a packing-ring 18, and the valve 15 is provided with a shank 19, which passes through the cap 17 and with which is connected a crank or handle 20, and the cap 17 is provided with three lugs or projections 21, which limit the movement of said handle or crank, and the handle or crank 20 is provided with a lug or projection 20^a, which operates in connection with the lugs or projections 21 to limit the movement of said handle, as above described. Two of the lugs 21 are placed on the opposite sides of the cap 17 and above the transverse center thereof and the other is placed at the bottom of said cap, and the handle may be connected with the shank 19 from either side of the device, one position of said handle being shown in Fig. 3.

The valve 15 is divided into three separate compartments or chambers, (designated by the reference-numerals 22, 23, and 24,) the compartment or chamber 22 being adjacent to the outer end of said valve, and said valve is cut out longitudinally of the top thereof, between the points 25 and 26, to form a longitudinal passage 27, which is in communication with the chamber or compartment 22 and with the steam-inlet 11 and with a chamber 27^a in the upper portion of the casing 10 over the inner end of said valve. The compartments 22, 23, and 24 are separated by partitions 28 and 29, which are provided with central screw-threaded openings, and a steam-jet nozzle 30 is secured in the partition 27, and a steam and water jet nozzle 31 is secured in the partition 29.

The valve 15 is provided near the middle thereof with a port or passage 32, which is adapted to communicate with the water-inlet 12, and near its inner end with two longitudinal ports or passages 33, which are adapted to communicate with the overflow 13, and the inner end of said valve is cut out at the upper side thereof for about one-half of its circumference, as shown at 34. The valve 15 is also cut out at the edges of the longitudinal chamber or passage 27, as shown at 35 in Fig. 1, to facilitate the operation of the device, as hereinafter described, and the partition 36, which separates the chambers 16 and 27, is provided with a steam-jet 37, which is

screwed thereinto, and a main discharge-jet 38 is screwed into the tubular outlet 14, and into which the steam-jet 37 discharges, as shown in Fig. 3.

5 The chamber 23 operates as a lifting-chamber and the jets 30 and 31 as lifting-jets to raise the water into the chamber 23 and to convey it into the chamber 16.

Fig. 6 is a cross-section of the device, showing the valve in the position it assumes when the injector is not in use, the steam-passage and the water-passage being entirely cut off and the overflow and outlet being partially open, as shown in Fig. 7, so that the chamber 16 will be entirely drained through the overflow 13. When the valve 15 is in this position, the lug 20^a on the crank or handle 20 rests against the lower lug or projection 21 on the head 17, and in order to start or open the injector it is only necessary to turn or raise the crank or handle 20 upwardly to a short space or part way of the distance between the lugs or projections 21 on the side of the head 17 between which the crank or handle projects. This operation will place the valve 15 in the position shown in Fig. 4, and the steam-inlet 11 will be placed in communication with the passage 27 by a small opening at 35. This allows the steam to pass into the chamber 22 and through the jets 30 and 31, and this operation lifts the water through the port or passage 32 into the chamber 23, and said port or passage 32 being only partially opened and said water is forced into the chambers 16. At this time the overflow 13 or the ports or passages 33 in the valve 15 are partially opened and the water flows out through said overflow. This operation produces a partial vacuum in the chamber 16, which operates to draw the water thereinto, and at the same time the valve is turned farther in the same direction, which admits the steam in full force and also at the same time closes the overflow, and said steam passes through the passage 27, through the chamber 27^a and the jet 37, and at the same time through the chamber 22 in the valve 15, through the jets 30 and 31, and draws with it the water, which is discharged into the chamber 16, from which it is forced through the main jet 38 into the boiler.

It will be apparent that the crank or handle 20 may be connected with the shank 19 of the valve from either side, and by reason of this fact the injector may be operated from either side.

Figs. 1 and 2 show the position of the valve when the device is in full operation, the steam and water ports or passages being fully open, and at this time the overflow 13 is closed, as shown in Fig. 3, and Figs. 4 and 5 show the position of the valve when the steam is first introduced, the water port or passage 25 being partially open, as is also the overflow 13, while Figs. 6 and 7 show the position of the valve when the injector is not in use, the steam and water ports or passages being

closed, while the water-overflow is partially open.

By means of the construction herein shown and described it will be seen that the valve 15 may be operated from either side and may be turned in either direction and that the result will be exactly the same, the valve ports or passages being so formed that no matter in which direction said valve is turned the inflow of the steam and water in the operation of the overflow and the discharge of the steam and water through the main jet 38 will be the same.

My improved injector is simple in construction and operation and perfectly adapted to accomplish the result for which it is intended, and it will be apparent that changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An injector for steam-boilers, comprising a main casing provided at its inner end with a tubular discharge and with a hollow conical valve which is mounted in the outer end thereof, said casing being also provided in the top of the outer end with a steam-inlet and in the bottom thereof with a water-inlet, and water-overflow, the overflow being located between the water-inlet and the tubular discharge, said valve being also provided with three chambers which are separated by partitions having jets placed therein, the inner end of the inner chamber being open and the bottom wall thereof being provided with two ports or passages which are adapted to communicate with the overflow and the central chamber being provided with a port or passage which is adapted to communicate with the water-inlet, said casing being also provided above the valve with a steam-chamber, and at the inner end thereof with a water-and-steam chamber, said chambers being separated by a partition in which is placed a steam-jet and a discharge-jet being also provided with a main discharge, and said valve being cut out longitudinally of the top thereof to form a communication between the chamber in the end thereof and the steam-chamber in the top of the main casing, substantially as shown and described.

2. An injector for steam-boilers, comprising a main casing provided with a tubular discharge at one end, a main jet located therein, a hollow longitudinal valve mounted in the end of said injector opposite the discharge, a steam-chamber in said main casing over said valve, and a steam-and-water chamber between the discharge and the inner end of said valve, said valve being also provided with three chambers separated by partitions having injectors therein, and said main casing being also provided in the top of the outer end thereof with a steam-inlet and in the bot-

tom thereof with a water-inlet and water-overflow and said valve with ports or passages which communicate with the water-inlet and the water-overflow and the inner end
5 of said valve being open and in communication with the steam-and-water chamber, and the said valve being cut out at the top longitudinally to form a communication between the steam-inlet, the chamber in the outer end of
10 said valve and the chamber in the top of the main casing, substantially as shown and described.

3. An injector of the class described provided with an operating-valve which is held
15 in place by a detachable cap or head, said valve being provided with a shank which passes through said cap or head and with a crank or handle which is adapted to be connected with said shank from either side and
20 means for limiting the movement of said crank or handle whereby the injector may be oper-

ated from either side, substantially as shown and described.

4. An injector of the class described, provided with a steam-inlet, a water-inlet and a
25 water-overflow, and a single valve for controlling said inlets and said overflow, substantially as shown and described.

5. An injector of the class described, provided with a steam-inlet, a water-inlet and a
30 water-overflow, and a single valve for controlling said inlets and said overflow and means for operating said valve from either side, substantially as shown and described.

In testimony that I claim the foregoing as
35 my invention I have signed my name, in presence of the subscribing witnesses, this 4th day of August, 1899.

CHARLES S. TAYLOR.

Witnesses:

C. C. OLSEN,
V. M. VOSLER.