

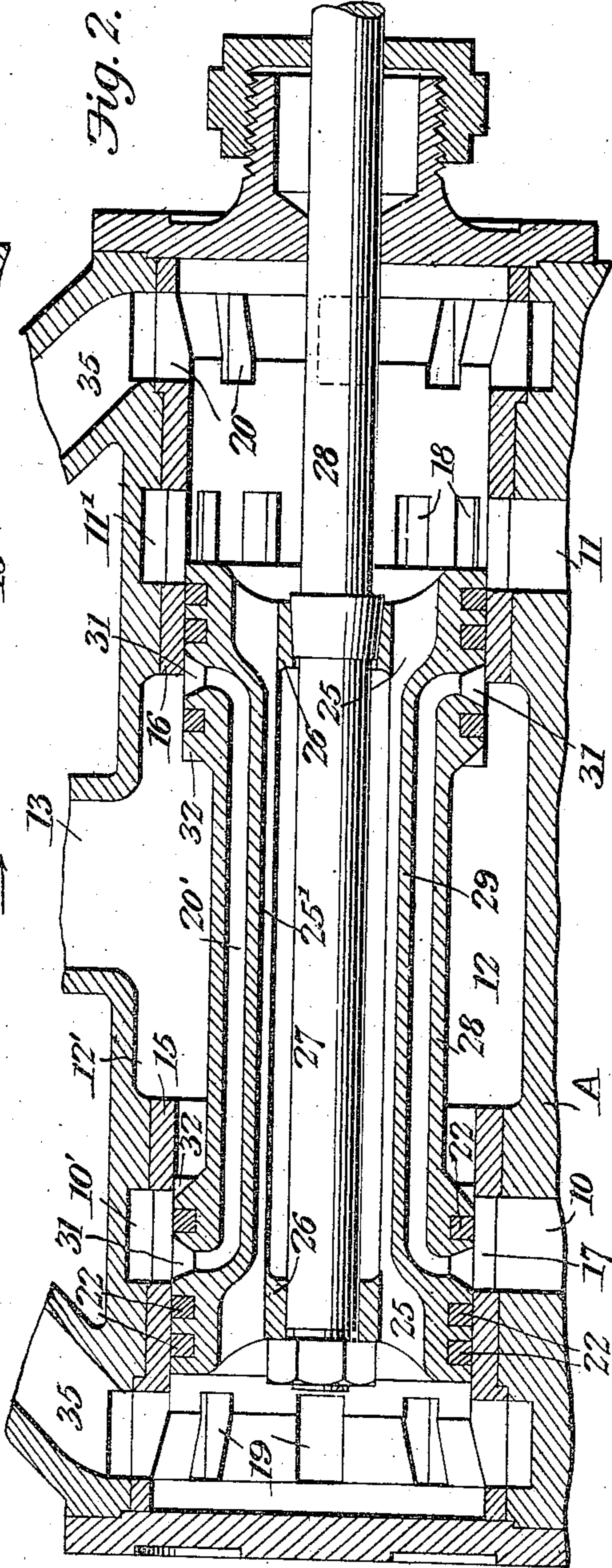
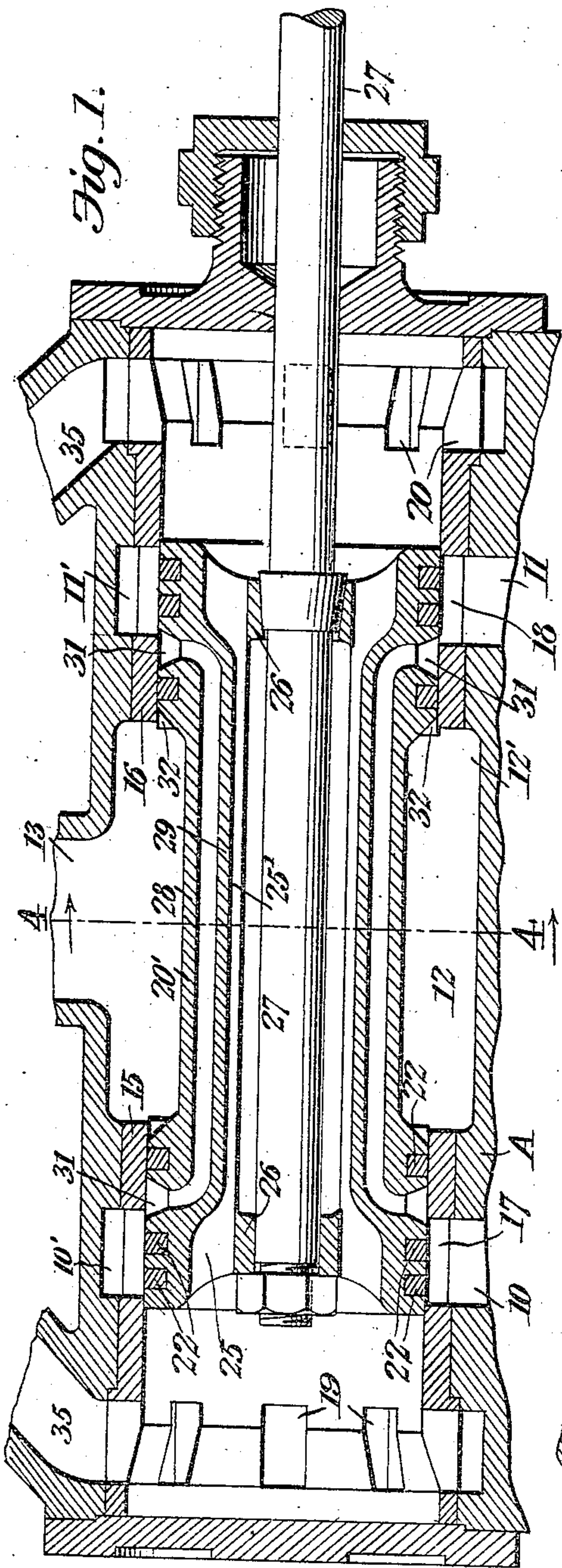
No. 855,422.

PATENTED MAY 28, 1907.

B. O. YEARWOOD.
VALVE.

APPLICATION FILED NOV. 17, 1905.

2 SHEETS—SHEET 1.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 4.

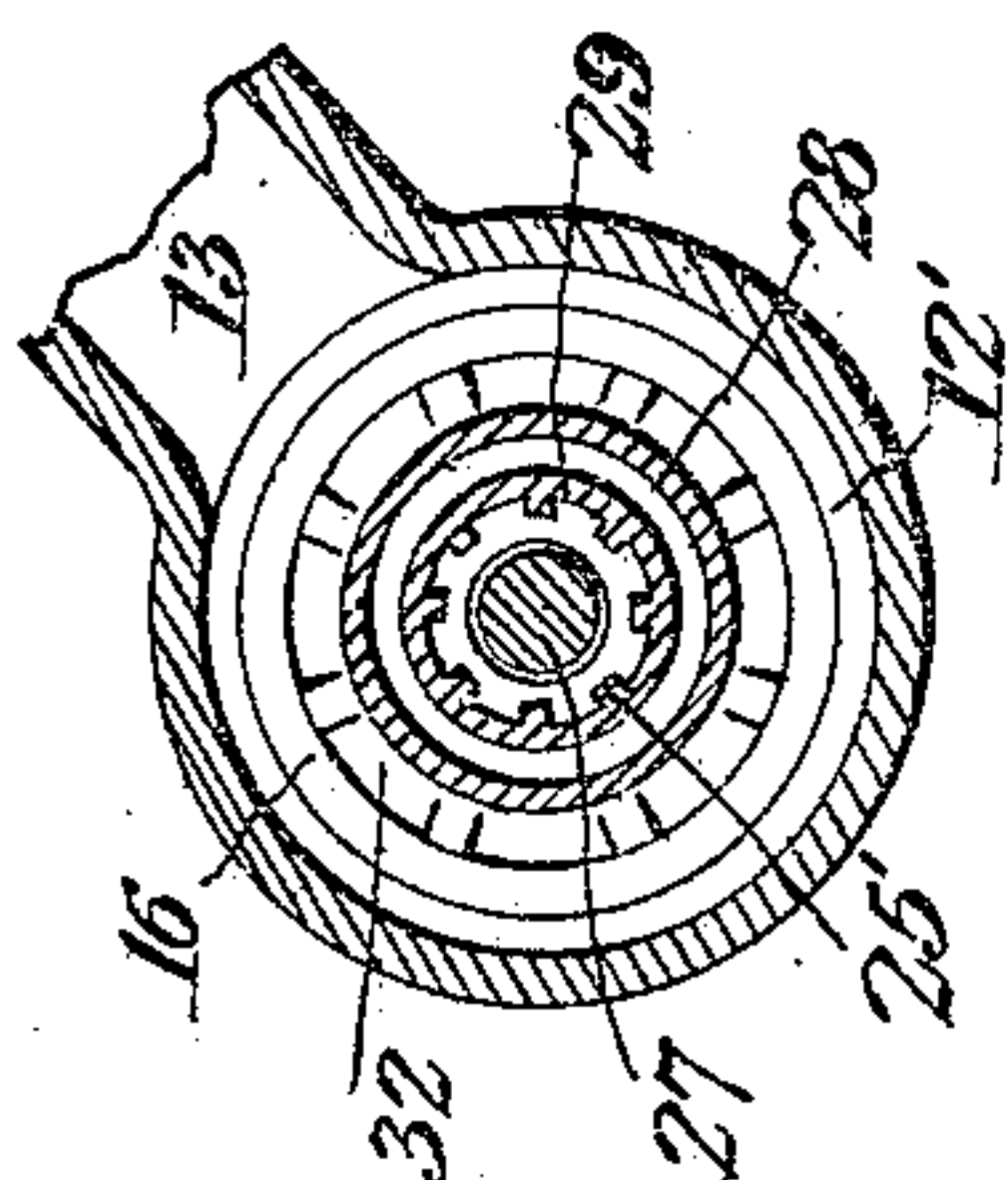
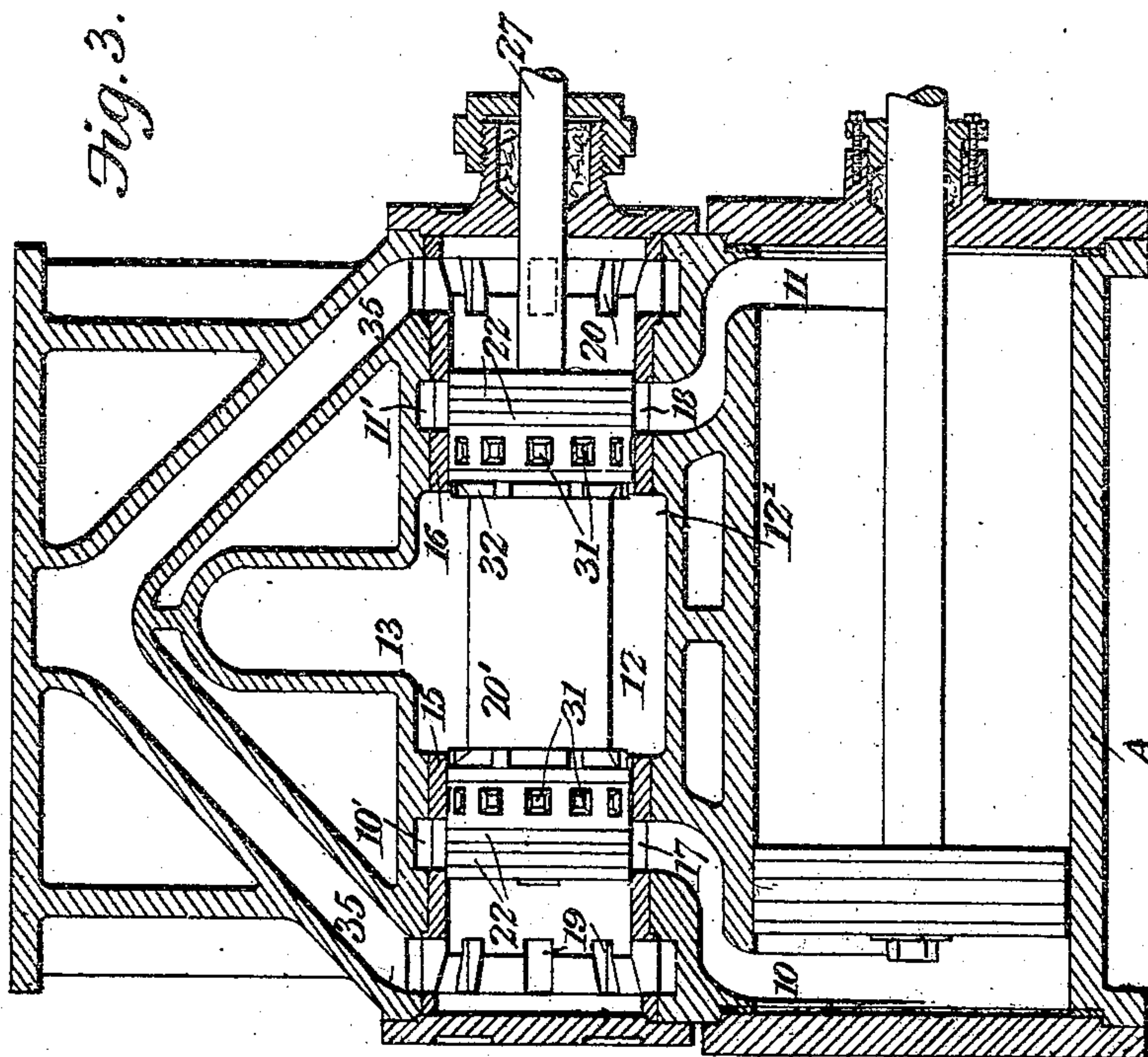


Fig. 3.



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UNITED STATES PATENT OFFICE.

BYRD OLLIVER YEARWOOD, OF PORTSMOUTH, VIRGINIA, ASSIGNOR OF
ONE-HALF TO E. SCHAEFER, OF TOCCOA, GEORGIA.

VALVE.

No. 855,422.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed November 17, 1905. Serial No. 287,852.

To all whom it may concern:

Be it known that I, BYRD OLLIVER YEARWOOD, a citizen of the United States, residing at Portsmouth, in the county of Norfolk and State of Virginia, have invented a new and useful Valve, of which the following is a specification.

This invention relates to valves for controlling the flow of steam or other fluid under pressure to engines, and has for one of its objects to provide a valve wherein comparatively slight travel will be necessary to fully open the ports, full boiler pressure being admitted at once to the cylinder and wire drawing of the steam being avoided.

A further object of the invention is to provide a valve in which the exhaust shall be full and free at all times, and any back pressure due from choking the exhaust will be avoided.

A still further object of the invention is to provide a piston valve which may be made at relatively low cost and which may be maintained in serviceable condition for a long period of time.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a sectional elevation through a valve chest and valve constructed in accordance with the invention. Fig. 2 is a similar view showing the valve at one end of its stroke. Fig. 3 is a cross sectional view showing a portion of a locomotive and illustrating the application of the valve for locomotive work. Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The cylinder A is provided with ports 10 and 11 leading to the valve chamber 12, the latter being bored out and provided with annular grooves 10' and 11', in its inner walls in alinement with the ports 10 and 11, respec-

tively. The valve chamber is further provided with a steam inlet port 13 that communicates with an annular groove 12' extending around the inner wall of the casing.

Arranged within the central bore of the casing are two bushings 15 and 16, within which the valve slides. These bushings are provided with ports 17 and 18 that are in constant communication with the ports 10 and 11, respectively, and the bushings are further provided with two sets of ports 19 and 20 in the form of openings that extend in continuous annular series around the bushings.

Arranged within the bushings is the valve 20'. The valve is cylindrical in form, having a central portion or periphery of reduced diameter, and enlarged end portions, the latter being of a diameter approximately the internal diameter of the bushings, and in each of these enlarged end portions of the valve is arranged a series of grooves for the reception of packing rings 22 in order to prevent leakage of steam. At each end of the valve are spider arms 25 extending from centrally disposed hub members 26 that are provided with openings for the passage of a valve stem 27 which may be secured to the valve in the usual manner. The valve proper is divided into two concentric tubes 28 and 29 that are connected to each other at intervals by webs 30 which divide the space between the two tubes into a steam passage of large area, and the ends of this steam passage open at the periphery of the enlarged end portions of the valve, the openings being disposed between two of the packing rings 22, and being flared at their ends, as indicated at 31, in order to permit the free passage of steam, and to secure the further advantage of quick opening of the ports and the establishing of communication between the steam supply and the cylinder. This form of port is, also, taken advantage of at the inner end of each of the enlarged portions, when passages 32 are formed at the shoulders which form the inner edges of such enlarged portions, these passages serving as steam ports in certain positions of the valve. The arms 25, hereinbefore referred to, are extended from end to end of the interior of the valve in the form of ribs 25' for strengthening purposes.

When the valve is in mid position, as shown in Fig. 1, both ports 10 and 11 leading

to the cylinder are closed, and no steam can pass from the main inlet 12 to either of said ports. When the valve moves to the position shown in Fig. 2, the port 11 will be
5 opened to permit the escape of steam from the engine cylinder, and during the movement of this valve to the position shown, the port 11 will be opened for a sufficient length of time to permit full escape of the steam before steam is admitted through the port 10 to the opposite end of the cylinder. During the movement of the valve to open the port 11, the port 31 at the left hand end of the valve moves fully over the port 10, but no
15 steam can be admitted to the cylinder until the opposite end of the port 31 has passed beyond the inner end of the valve bushing, whereupon steam commences to flow through the large annular steam port 31 to the port
20 10, instantly filling the cylinder at boiler pressure, and at the same time the smaller port or passage 32, also places the main steam supply in communication with the port 10, as will be clearly seen on reference to
25 Fig. 2, so that there are in effect two ports opened simultaneously. On the reverse movement of the valve, the supply of steam through the port 32 will first be cut off, and then the right hand end of port 31 in moving
30 toward the port 18 of the bushing, will cut off the main steam supply without, however, materially reducing the area of the exhaust port 11, which is freely opened to permit the escape of steam which may remain in
35 advance of the moving piston. The exhaust steam is free to pass through the large central passage of the valve and flows to the stack through the end ports 35.

40 With a valve constructed in accordance with this invention it requires comparatively slight movement of the valve to fill the cylin-

der at boiler pressure, and the parts are so proportioned that before communication is established between the steam supply and one end of the cylinder, the steam is wholly
45 exhausted from the opposite end of the cylinder.

Having thus described the invention, what is claimed is:—

In combination, a valve casing having an
50 approximately central inlet port and provided with exhaust ports at both ends, bushings arranged in the casing and each provided with an annular series of ports, cylinder ports in communication with the bushing
55 ports, a piston valve having enlarged end portions that slide within the bushings and a reduced central portion opposite the steam inlet, such reduced central portion forming a
60 port through which steam may be directed from the main inlet to either of the bushing
65 ports, said valve having a central opening extending from end to end thereof to permit the free passage of the exhaust to the exhaust ports at both ends of the cylinder in
70 all positions of the valve, and an annular steam port surrounding and separate from the central opening, the annular steam port having both of its ends extended outward to the periphery of the enlarged end portions of
75 the valve, the mouths of said annular port being tapered, and the opposite ends of the reduced central portion being, also, tapered. substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

BYRD OLLIVER YEARWOOD.

Witnesses:

F. C. DEMPSEY,
F. E. GERKE.