

No. 751,281.

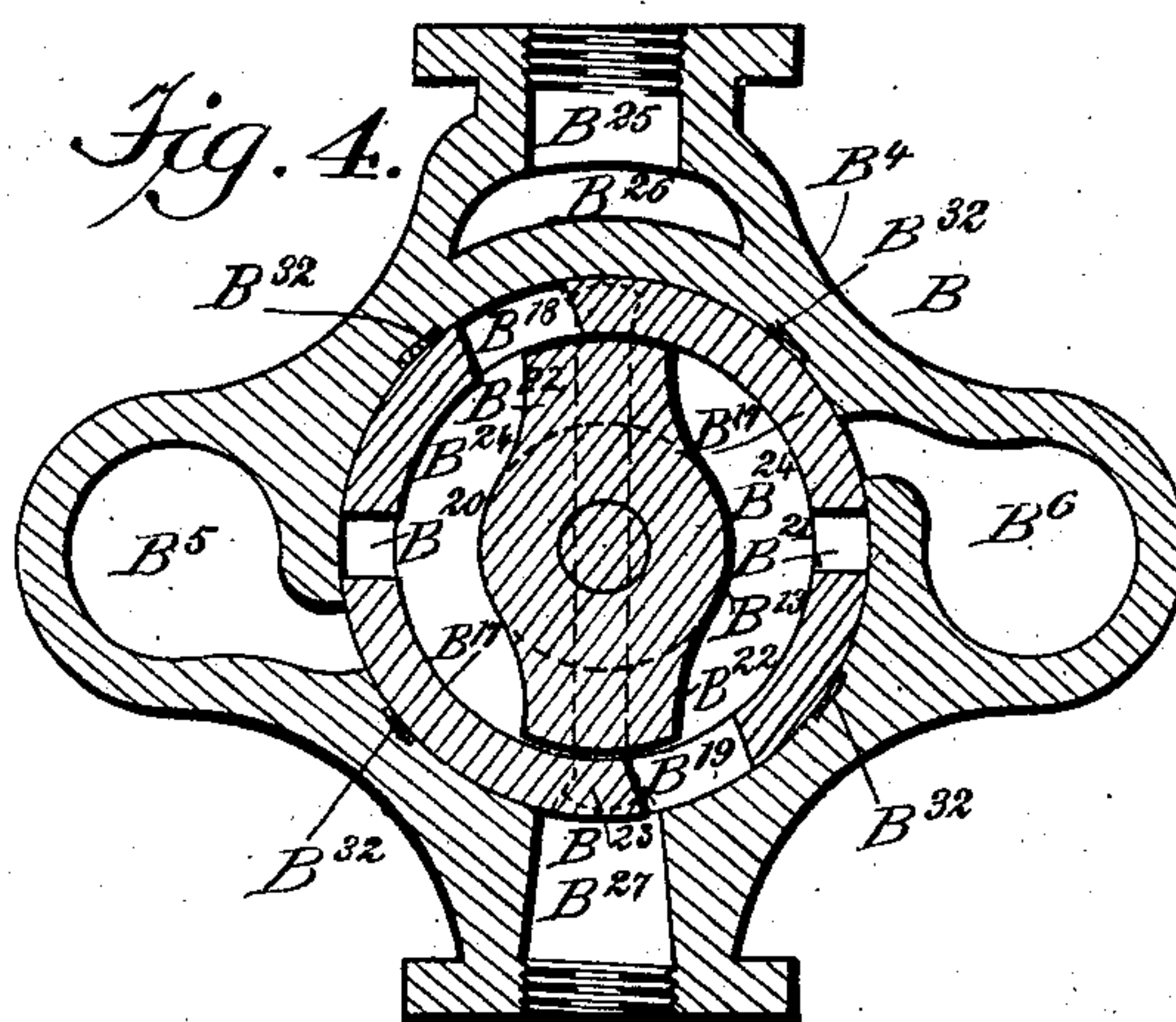
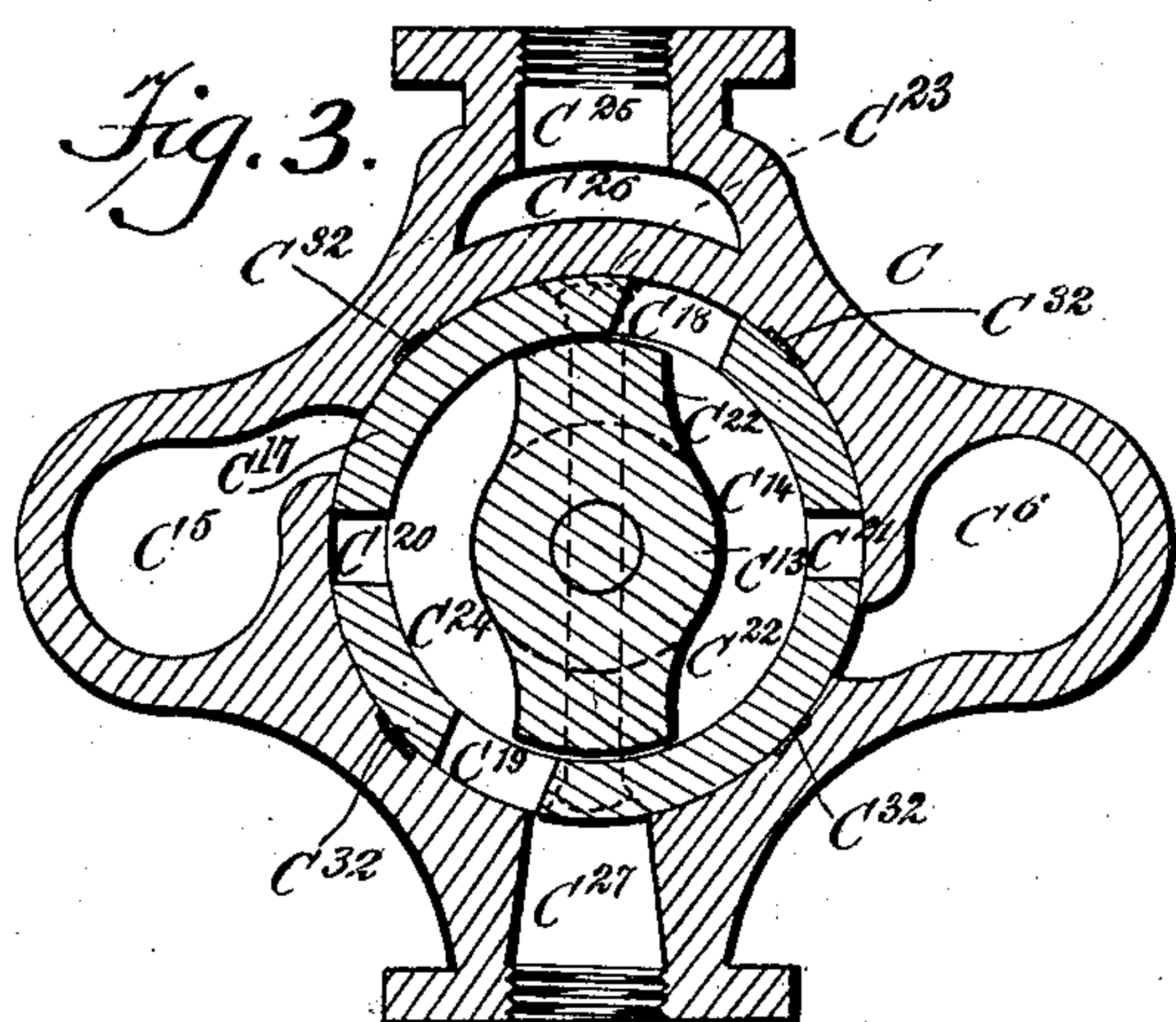
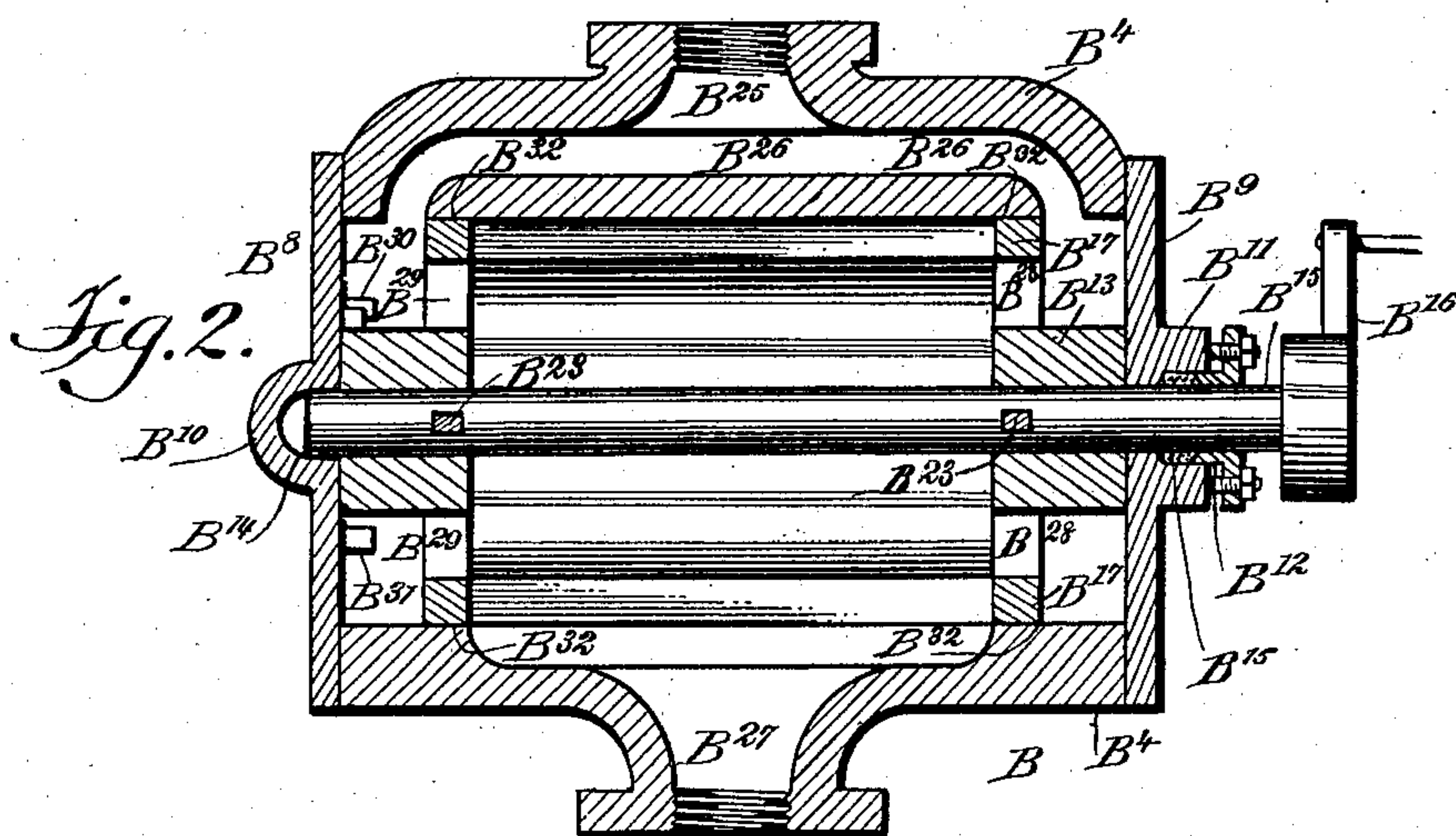
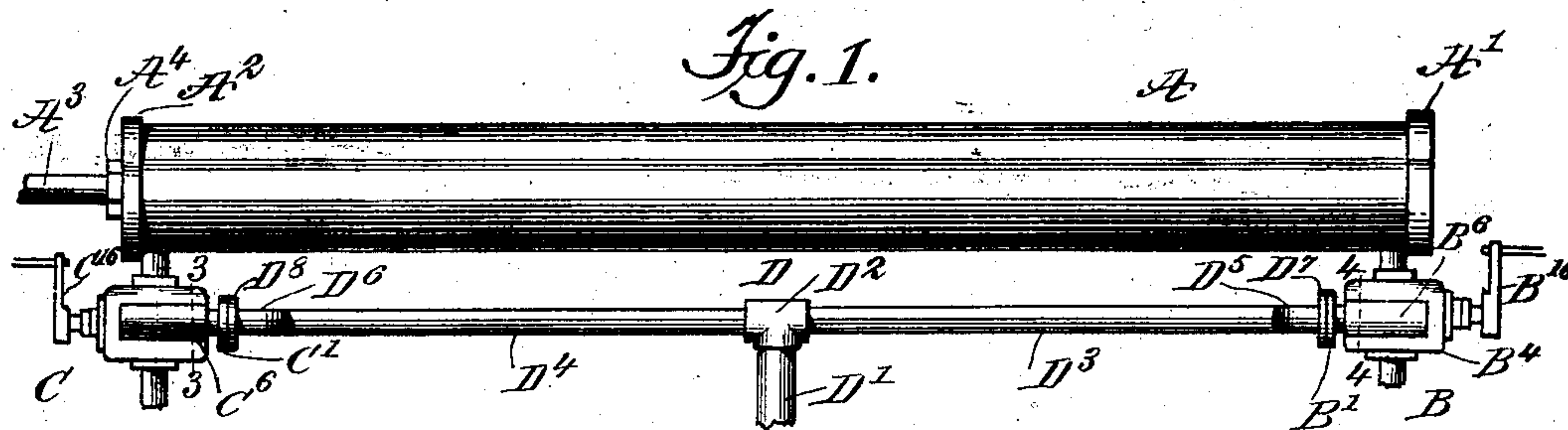
PATENTED FEB. 2, 1904.

R. GILLETTE.
ROTARY VALVE.

APPLICATION FILED OCT. 29, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

A. R. Appleman
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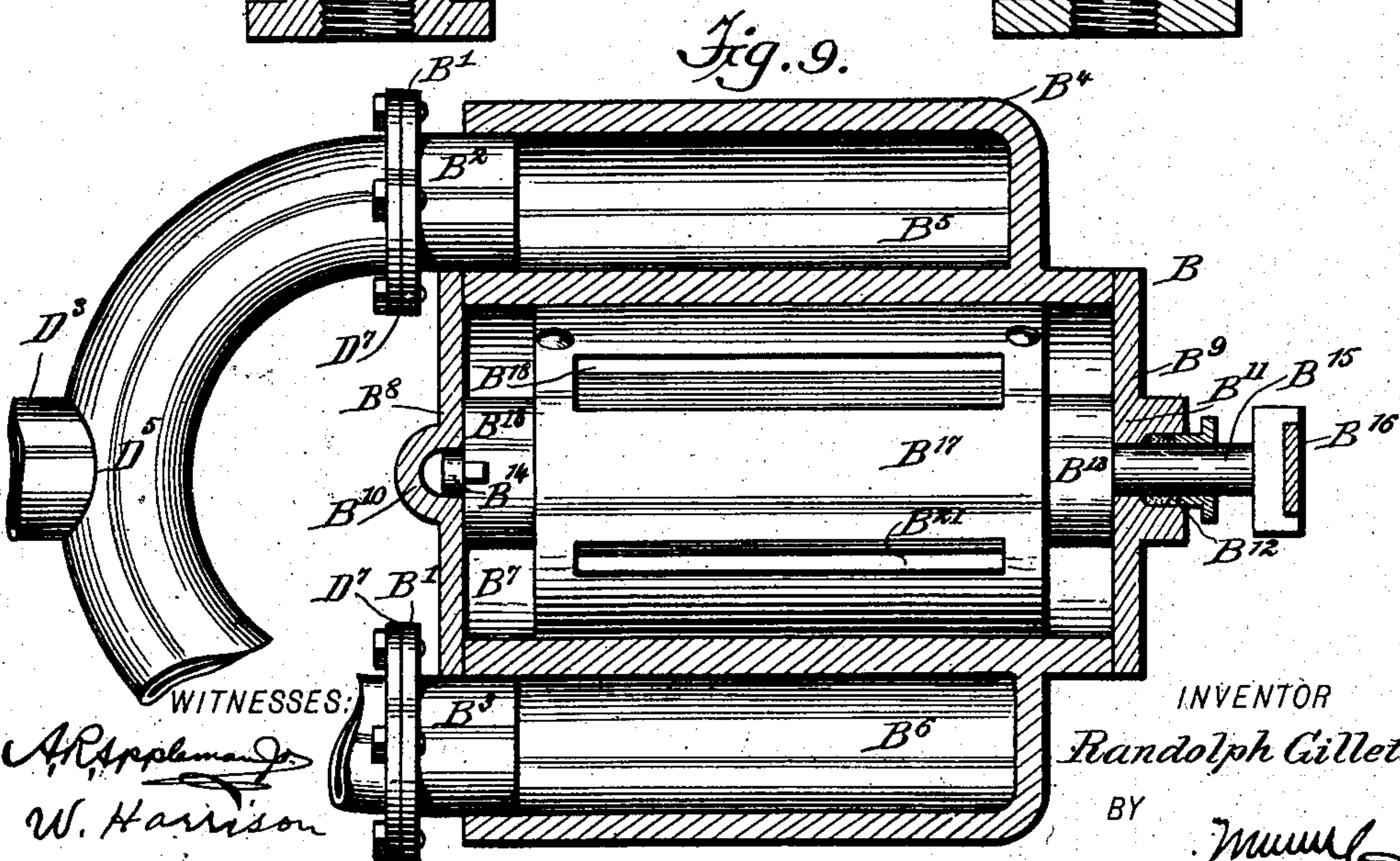
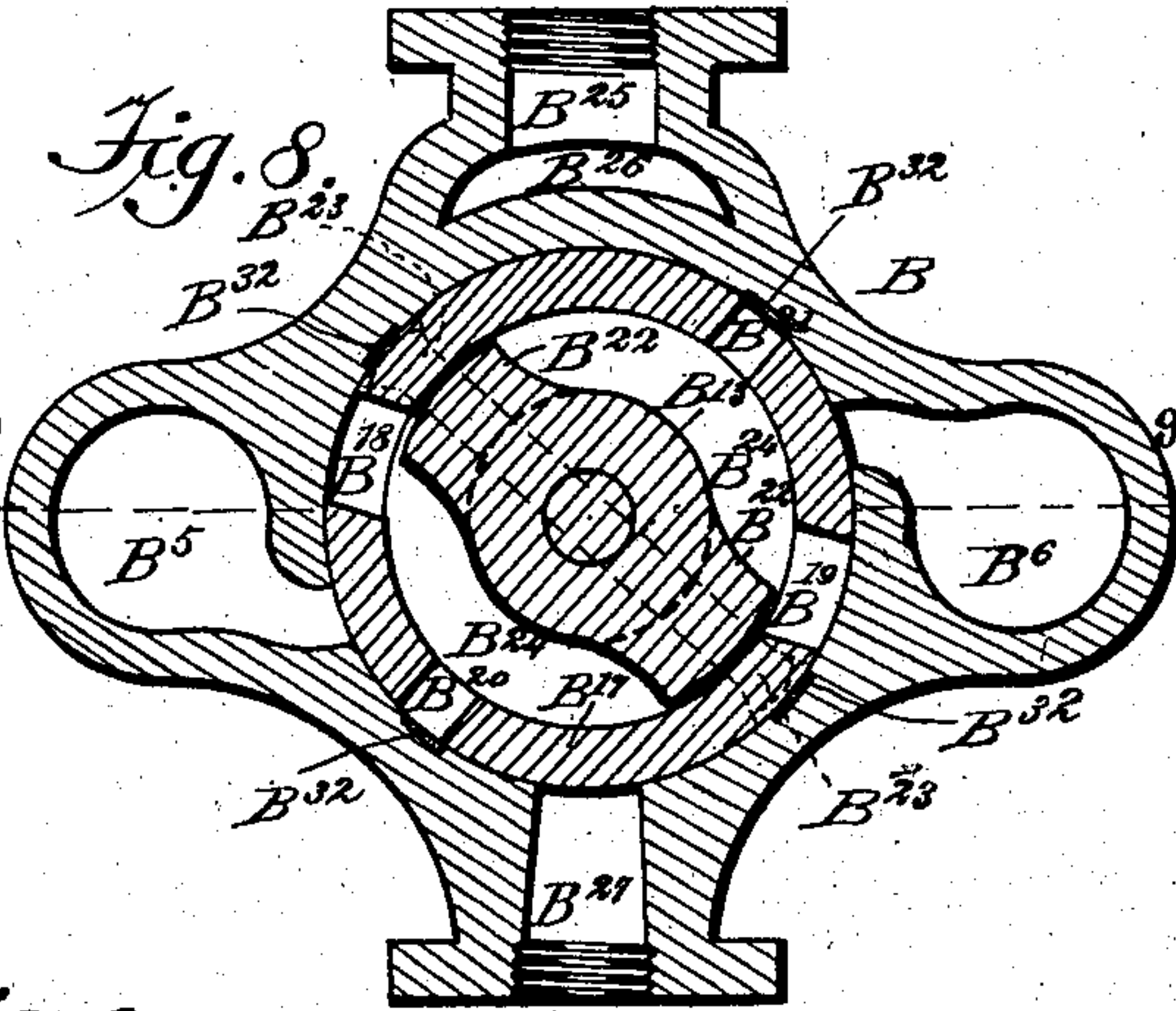
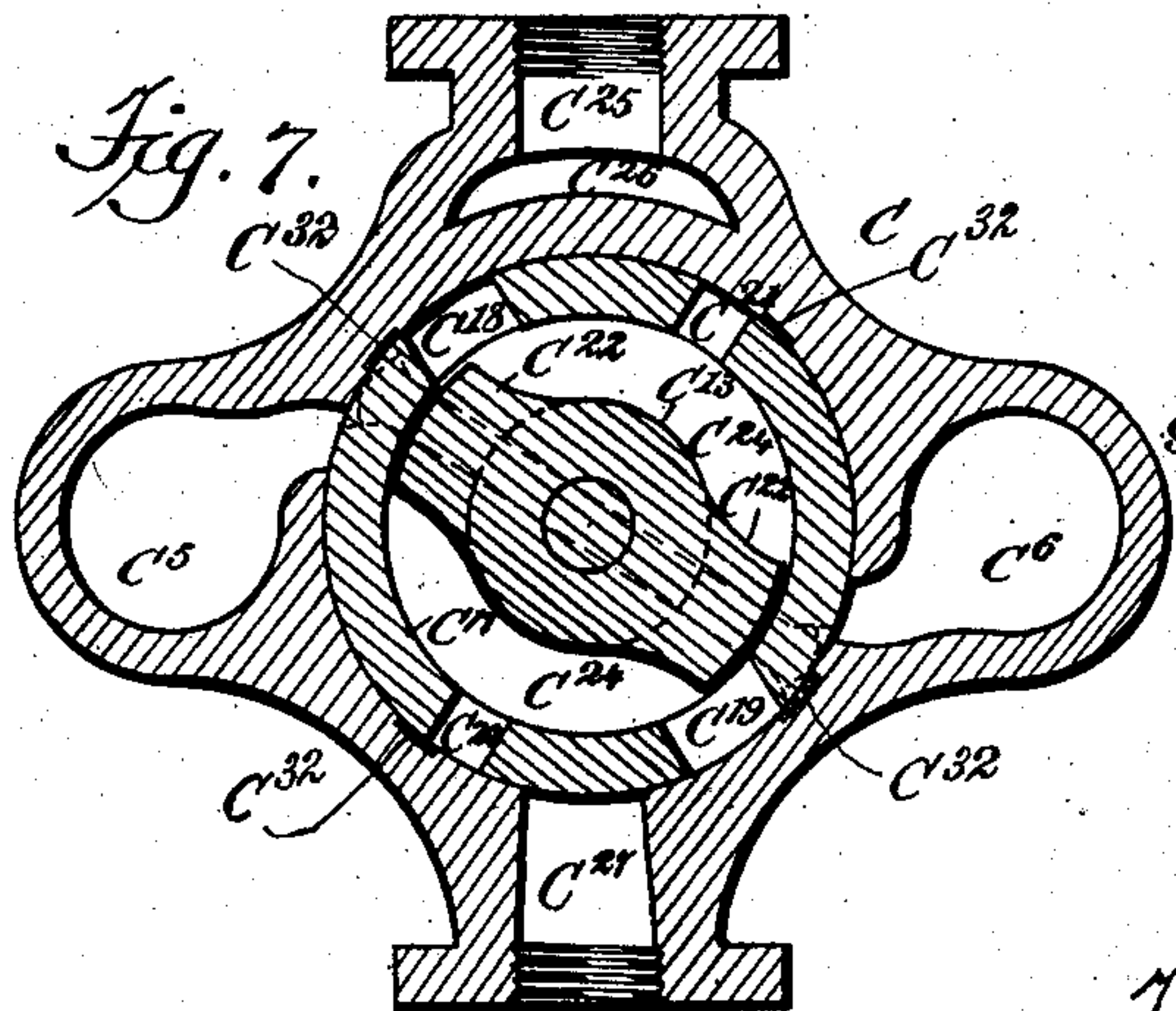
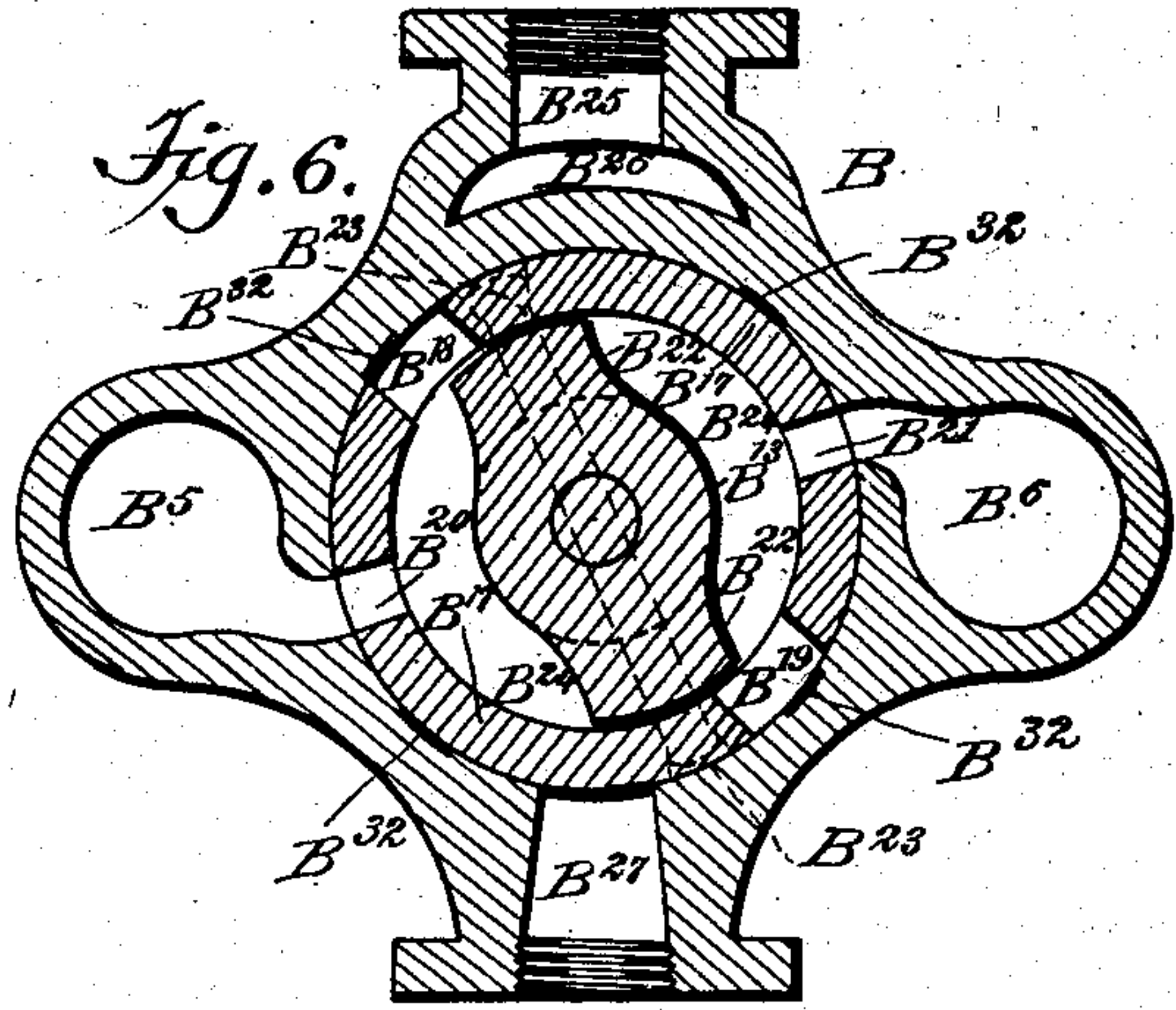
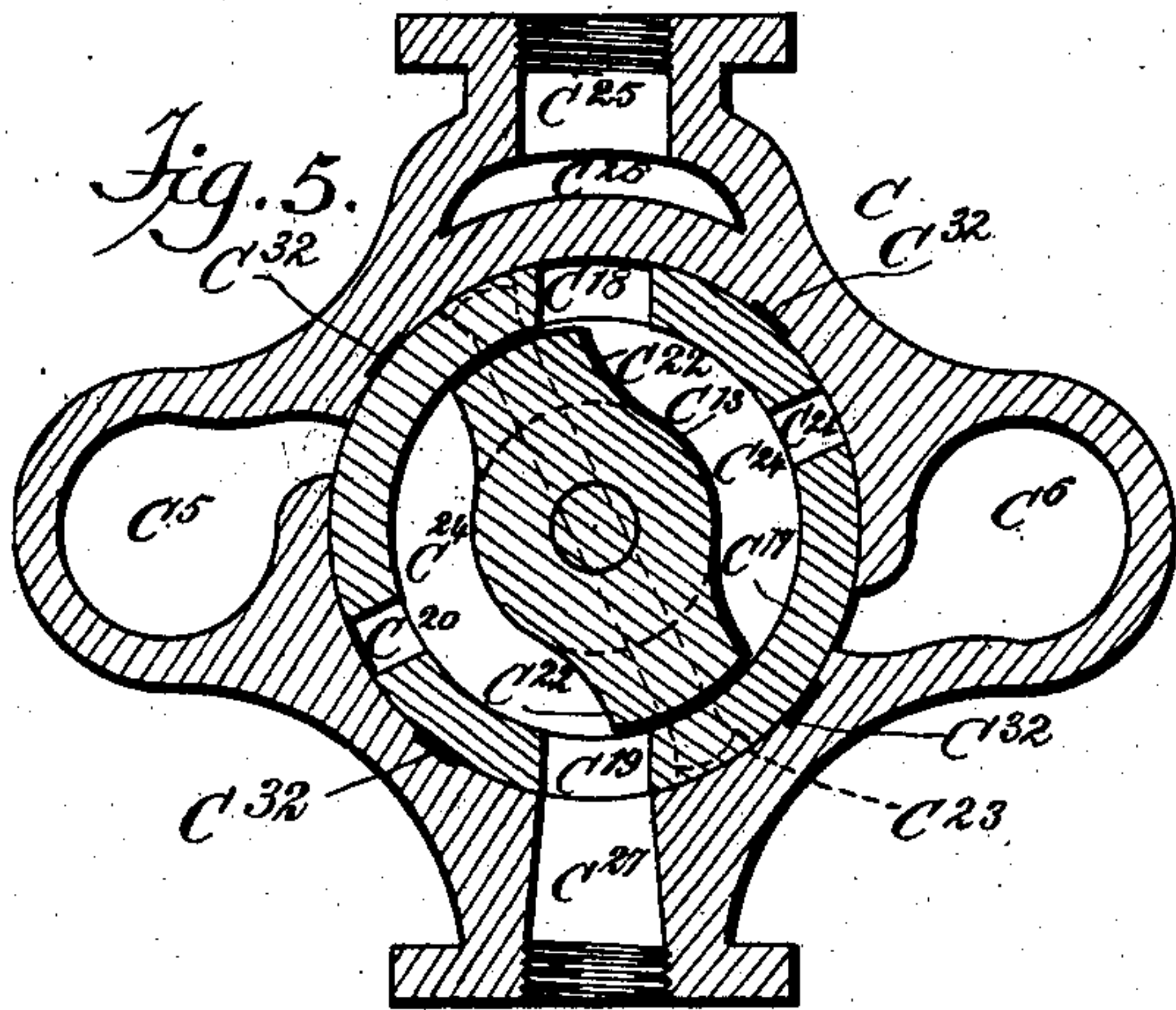
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A. R. Appleman
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UNITED STATES PATENT OFFICE.

RANDOLPH GILLETTE, OF LITTLEFALLS, MINNESOTA, ASSIGNOR OF ONE-
HALF TO SPIRIT J. VASALY, OF LITTLEFALLS, MINNESOTA.

ROTARY VALVE.

SPECIFICATION forming part of Letters Patent No. 751,281, dated February 2, 1904.

Application filed October 29, 1902. Serial No. 129,235. (No model.)

To all whom it may concern:

Be it known that I, RANDOLPH GILLETTE, a citizen of the United States, and a resident of Littlefalls, in the county of Morrison and State of Minnesota, have invented a new and Improved Rotary Valve for Steam-Feeds, of which the following is a full, clear, and exact description.

My invention relates to rotary valves used more particularly for the steam-feeds of saw-mills and analogous devices.

I will describe a rotary valve for steam-feeds embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a fragmentary elevation of a steam-cylinder to which my invention is applied. Fig. 2 is a vertical longitudinal section through the rotary valve and its accompanying parts. Fig. 3 is a vertical cross-section of the same upon the line 3 3 of Fig. 1. Fig. 4 is a somewhat similar section upon the line 4 4 of Fig. 1. Figs. 5 and 7 are sections in all respects similar to Fig. 3, but showing the revoluble valve-plug in slightly different positions. Figs. 6 and 8 are sections similar to Fig. 4, and also showing the revoluble valve-plug in slightly different positions. Fig. 9 is a horizontal section upon the line 9 9 of Fig. 8 and showing certain details in plan.

The steam-feed cylinder A is provided with heads A' A² and with a piston-rod A³, which passes through a stuffing-box A⁴ to a piston inside of said cylinder, these parts being of the usual construction. The cylinder is provided at its respective ends with the revoluble valves B C, which are connected together and are supplied with steam by means of the steam-fixtures D. The live-steam pipe D' is provided with a T D², this T being fitted with pipes D³ D⁴, provided, respectively, with bifurcated pipes D⁵ D⁶ of substantially horse-shoe form and terminating in flanged ends D⁷ D⁸. Connected with the flanged ends D⁷ are the flanged ends B' of the nipples B² and B³ of the rotary valve B. (See Fig. 9.) The

casing of the valve B is shown at B⁴ and is provided with live-steam ports B⁵ B⁶ and with a central cylindrical opening B⁷. The valve-casing is provided with heads B⁸ B⁹, provided with bearings B¹⁰ B¹¹. The bearing B¹¹ has a stuffing-box B¹², as shown more particularly in Fig. 9.

Revolubly mounted within the cylindrical aperture B⁷ are two hubs B¹³, mounted upon a shaft B¹⁴, which is mounted in bearings B¹⁵ and provided with a crank B¹⁶. Disposed within the casing is a revoluble plug-cylinder B¹⁷, provided with exhaust-ports B¹⁸ B¹⁹ and with live-steam ports B²⁰ B²¹.

Integrally mounted upon the hubs B¹³ are webs B²², and to these webs the plug-cylinder B¹⁷ is rigidly secured by means of pins B²³, which are slightly sunken therein and headed down. The webs B²² have substantially the same length as the diameter of the plug-cylinder B¹⁷.

Owing to the shape of the hubs B¹³ and the webs B²², the plug is provided with apertures B²⁴, which serve as steam-passages when the plug occupies certain positions. My purpose in giving the revoluble plug a composite form is to prevent unequal expansion and contraction of the plug when the same is subjected to extremes of heat or when one part of the plug is heated more than the other part. I have found that the composite form of plug is less liable to bind because of the expansion and contraction peculiar to various degrees of heat. Preferably I make the cylinder B¹⁷ fit a little loosely upon the webs B²² and then by means of the pins B²³ secure the two members rigidly together. This construction permits of slight relative movements due to expansion and contraction and does not necessitate as much distortion of the plug as would be the case if all of the movable parts were made integral.

The upper portion of the valve-casing is provided with steam-passages B²⁵ B²⁶ of the shape shown, and the lower portion of said casing is provided with an exhaust-passage B²⁷. The ends of the passages B²⁴ terminate in openings B²⁸ B²⁹, thus freely connecting the steam-passages B²⁵ and B²⁶ of the casing with

the passages B²⁴ of the plug. Stops B³⁰ B³¹ are provided for limiting the movements of the plug C¹³, and consequently the other parts of the plug.

5 Lubricant-grooves B³² are provided within the casing B⁴ at this point, as indicated more particularly in Figs. 2, 4, 6, and 8. The arrangement of these grooves is such that the pressure of the steam and the normal working of the revoluble plug tends to work the
10 lubricant out into the points where it is needed, thereby insuring easy movement of the plug.

The structure of the valve C is substantially the same as that of the valve B, just described.

15 The flanged heads C' of the valve C are connected with the flanged heads D⁸ of the bifurcated pipe D⁶. The live-steam port C⁵ (shown at the left of Figs. 3, 5, and 7) is analogous to the port B⁶, already described. So, also,
20 the live-steam port C⁶ is analogous to the live-steam port B⁵. The hubs C¹³ are provided with webs C²², secured by pins C²³ to the plug-cylinder C¹⁷, this cylinder being provided with exhaust-ports C¹⁸, C¹⁹, C²⁰, and C²¹, as above described, with reference to the valve B, and
25 the steam-passages C²⁵ C²⁶ C²⁷ and the lubricant-grooves C³² have the same construction as the corresponding parts already described with reference to the valve B. The valve C
30 is also provided with bearings, a stuffing-box, and with a crank C¹⁶.

The operation of my device is as follows: Steam being turned on through the pipe D', the cranks B¹⁶ C¹⁶ are simultaneously moved
35 forward or backward, as desired, this being done by means of any well-known mechanical expedient. By the movement of the cranks the revoluble plugs are rotated backward and forward within certain limits. Figs. 3 and 4
40 represent the valves in such position that steam can leave, but cannot enter the cylinder A. The valves being moved slightly, as indicated in Figs. 5 and 6, steam enters simultaneously through the ports B⁵ B⁶ of the casing and passes through the ports B²⁰ B²¹ to the interior of the plug-cylinder B¹⁷, from whence it escapes at the open ends B²⁸ B²⁹ and also
45 passes through the steam-passages B²⁶ B²⁵ to the cylinder, forcing the piston thereof toward the left in Fig. 1. The exhaust-steam passes downward through the passages C²⁵ C²⁶ and passage C²⁴ to the exhaust-passage C²⁷, thus making its escape. The valves being moved still farther, they assume the position
50 indicated in Figs. 7 and 8, so that steam can neither enter nor leave the cylinder A.

The object of the excessive movements indicated in Figs. 7 and 8 is to enable the steam-feed to be stopped in case any obstruction
60 should prevent the forward or backward movement of the cranks B¹⁶ C¹⁶ or any mechanism connected therewith for actuating them. In other words, if the workman finds that he cannot stop the steam-feed by causing the

cranks to pass backward he drives them forward in the same direction, and thus stops the feed, or if the carriage is moving backward and he cannot cause the cranks to move forward he can drive them backward in the same direction and stop the feed. 65 70

An important feature of my invention is the fact that the live steam when fed through the ports B⁵ B⁶ C⁵ C⁶ is made to enter the revoluble plug by distinct and independent routes. Where ports are in communication with each other by a saddle-shaped channel, as is sometimes the case, the walls of the casing are liable to spring and bind upon the plug, owing to the excessive pressure of the steam. 75

I have found that valves for the purpose above indicated cannot be properly balanced except by feeding the steam through distinct and independent passages to different sides of the plug. 80

It will be further noted that all of my several improvements above mentioned conspire to form a valve in which all of the parts are worked freely relatively to each other. 85

The important part that passages B¹⁸ and C¹⁸ play in the proper working of the valve is that each of these passages are made in the plug-cylinder, so as to balance the steam-pressure when steam is within said plug-cylinder, also to equalize the expansion of the plug-cylinder under different degrees of heat. 90 95

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

1. In a steam-feed rotary valve, the combination of a casing provided with ports, a plug revolubly mounted within said casing and likewise provided with ports, said plug consisting of a revoluble central member provided with webs, a plug-cylinder mounted upon said central member and engaging the edges of said webs, and a plurality of pins extending entirely through said webs and said central member, the ends of said pins engaging said plug-cylinder. 100 105

2. In a steam-feed rotary valve, the combination of a casing provided with ports, a plug revolubly mounted within said casing and likewise provided with ports, said plug consisting of a revoluble central member provided with webs integral therewith, a hollow cylinder encircling said revoluble member and loosely engaging said webs, said cylinder and said webs being provided with holes registering with each other, and pins passing diametrically through said webs and said central member, and engaging said hollow cylinder. 110 115 120

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RANDOLPH GILLETTE.

Witnesses:

WILLIAM KRAUSE,
STEPHEN C. VASALY.