

No. 847,369.

PATENTED MAR. 19, 1907.

G. E. RIBLET.  
STEAM ENGINE VALVE.  
APPLICATION FILED DEC. 18, 1905.

4 SHEETS—SHEET 1.

Fig. 2.

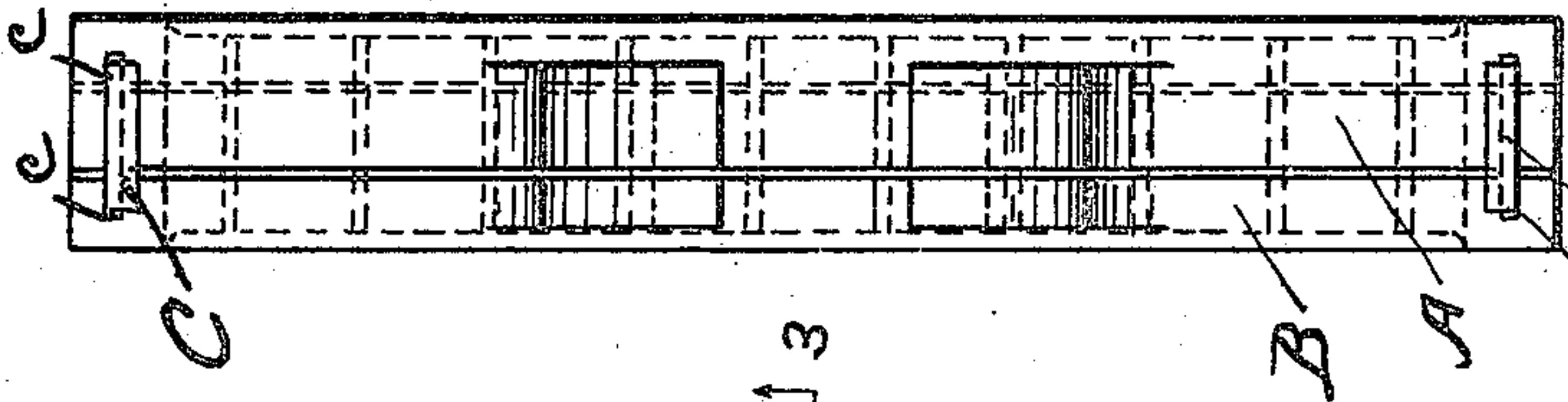


Fig. 1

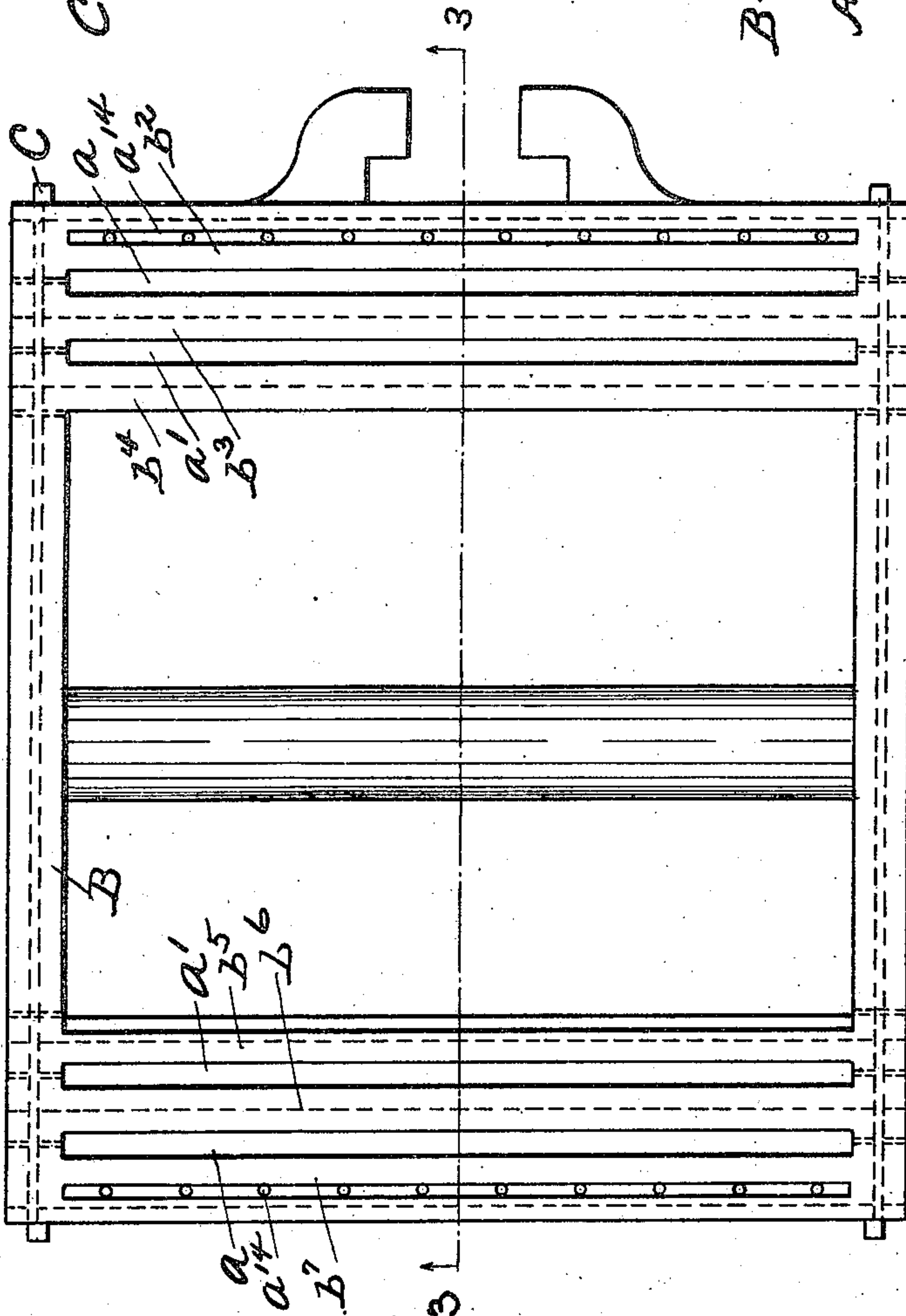
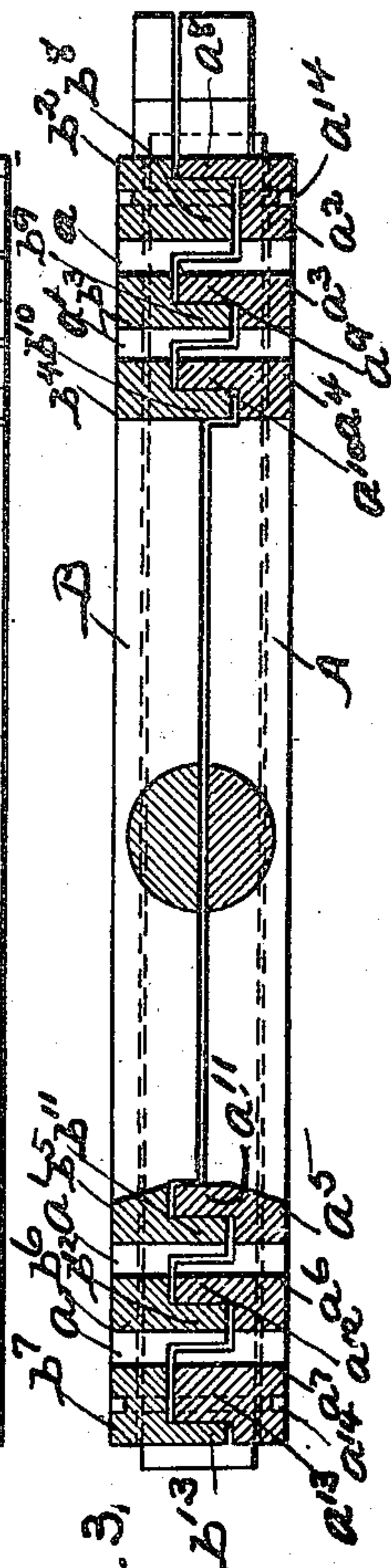


Fig. 3.



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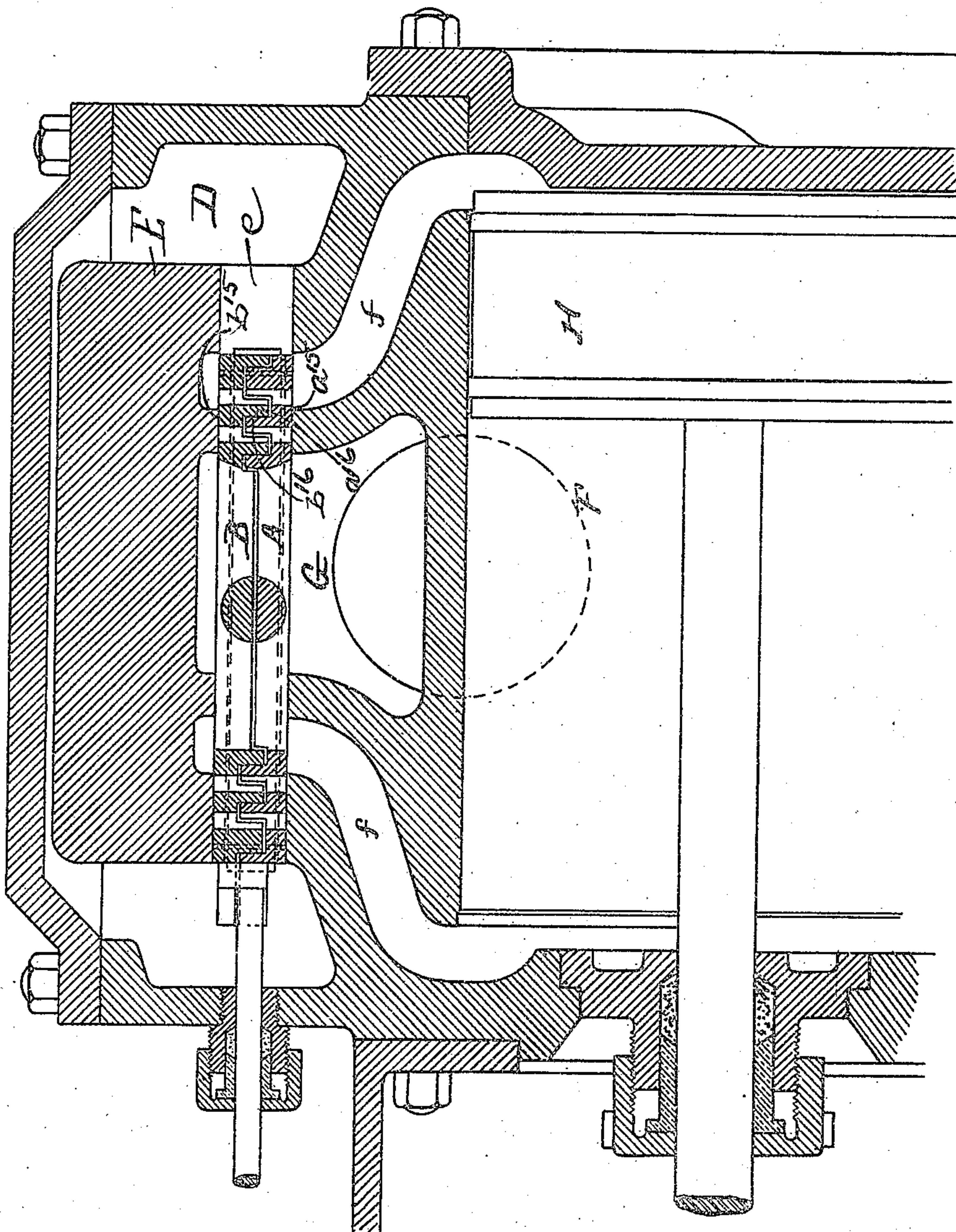
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4 SHEETS—SHEET 2.

Fig. 4.



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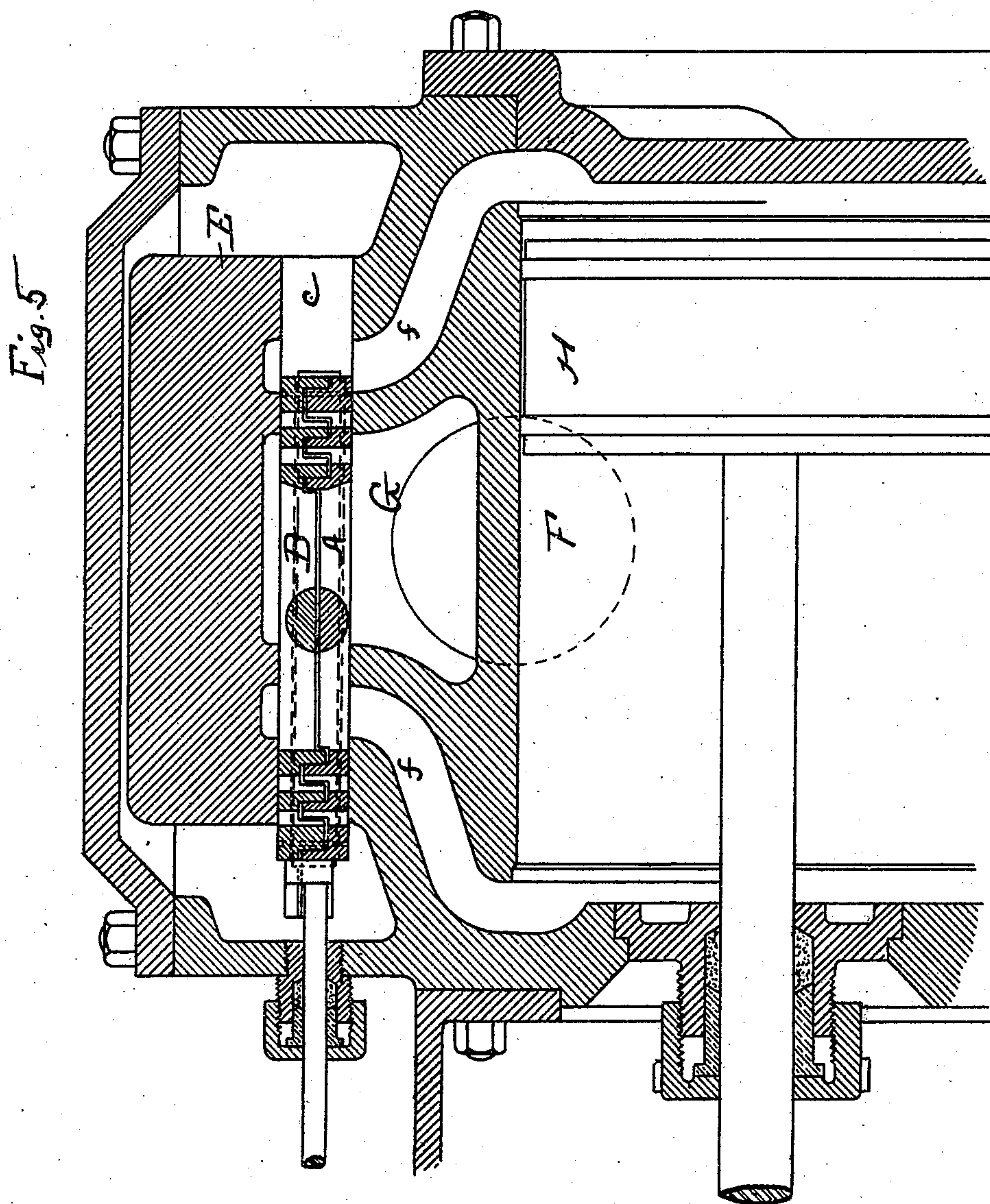


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4 SHEETS—SHEET 3.



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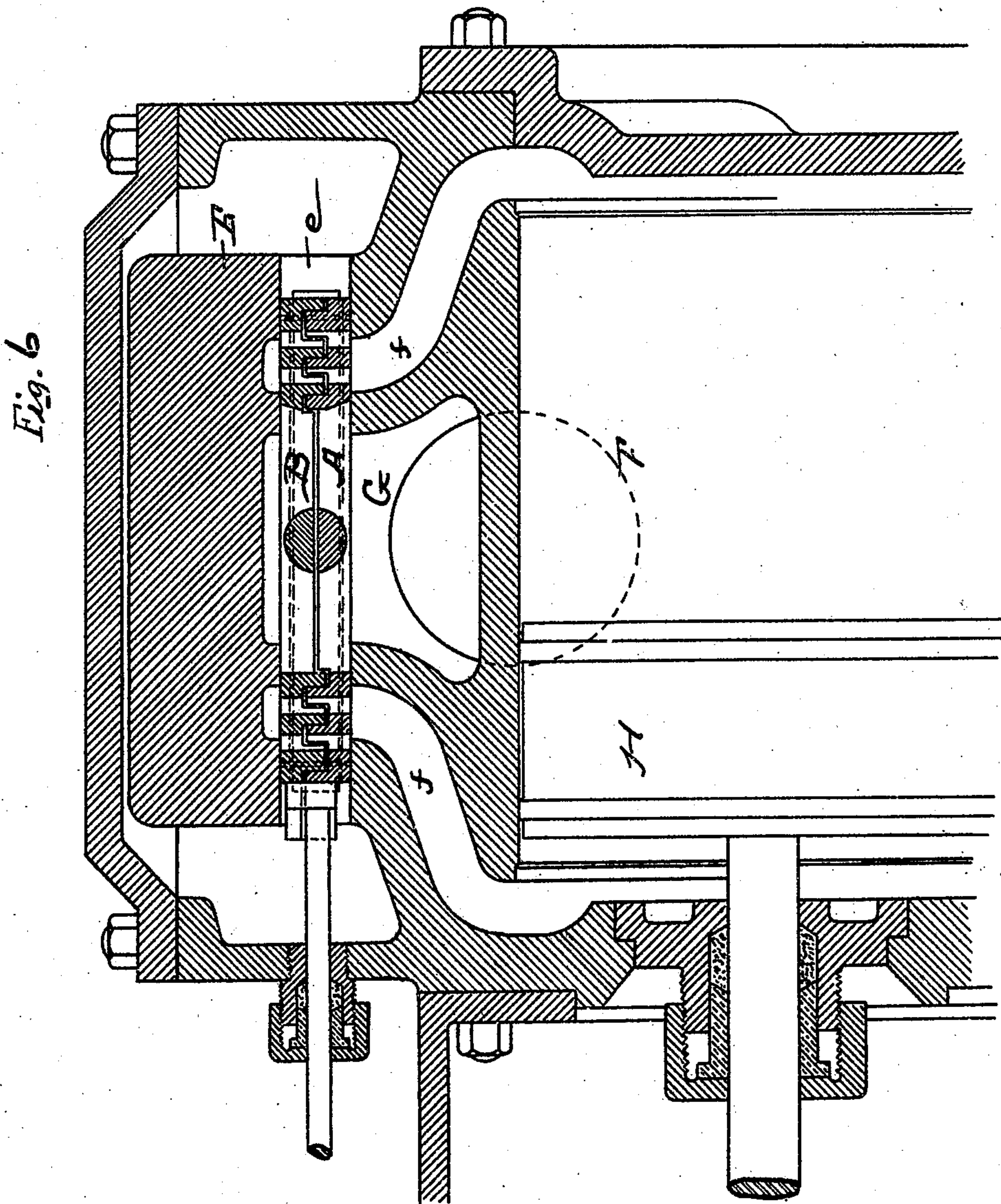
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# UNITED STATES PATENT OFFICE.

GEORGE E. RIBLET, OF ERIE, PENNSYLVANIA.

## STEAM-ENGINE VALVE.

No. 847,369.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed December 18, 1905. Serial No. 292,363.

*To all whom it may concern:*

Be it known that I, GEORGE E. RIBLET, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Steam-Engine Valves, of which the following is a specification.

This invention relates to steam-engine valves, and consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims.

The invention is illustrated in the accompanying drawing, as follows:

Figure 1 shows a plan view of the valve; Fig. 2, an end elevation; Fig. 3, a section on the line 3 3 in Fig. 1. Fig. 4 shows a section through a cylinder and a steam-chest with the valve and piston in the position assumed just as steam is admitted to the right end of the engine, as shown in said figure; Fig. 5, a similar view with the parts slightly advanced; Fig. 6, a similar view with the parts in the position assumed just prior to the admission of steam to the left end of the cylinder.

The valve shown is of the "gridiron" type.

A marks the part operating upon the valve-seat, and B the part operating against the pressure-plate.

The parts have the corresponding ports  $a$  and  $a'$ , these ports operating with the ends of the valve and in connection with the recesses  $e'$  in the pressure-plate E to give a double-port effect, the port  $a$  for delivering steam and the port  $a'$  for the exhaust. The pressure-plate E is supported by the bars  $e$ , this being common practice. The valve is shown in a steam-chest D. This is connected with the cylinder F by means of the usual ports  $f$  and with the exhaust by the usual exhaust-port G. A piston H is shown in the cylinder.

The bridge-pieces  $a^2$ ,  $a^3$ ,  $a^4$ ,  $a^5$ ,  $a^6$ , and  $a^7$  extend across the part A at the sides of the parts  $a$  and  $a'$ , and corresponding bridge-pieces  $b^2$ ,  $b^3$ ,  $b^4$ ,  $b^5$ ,  $b^6$ , and  $b^7$  similarly extend across the part B. The bridge-pieces of the part A have the offsets  $a^8$ ,  $a^9$ ,  $a^{10}$ ,  $a^{11}$ ,  $a^{12}$ , and  $a^{13}$ . All of these offsets are toward the right, as clearly shown in Fig. 3, and their closure-surfaces face toward the left. Opposing offsets  $b^8$ ,  $b^9$ ,  $b^{10}$ ,  $b^{11}$ ,  $b^{12}$ , and  $b^{13}$  are arranged in the bridge-pieces of the part B, all said offsets being toward the left and the closure-surfaces facing toward the right and contacting the closure-surfaces of the offsets on the bridge of the part A to form a closure along

the bridge-pieces. In this construction it will be noted that the exposed areas that tend to press these closure-surfaces together are much greater than those opposing them. For example, take the bridge-pieces  $a^2$  and  $b^2$ . The exposed surfaces on the bridge-piece  $a^2$  are much greater at the end of the valve than within the port, and consequently the tendency is to force the part A toward the left. The exposed surfaces on the bridge-piece  $b^2$ , on the contrary, are much less at the end of the valve than within the port, and consequently the tendency of the part B is to be crowded to the right, so that the closure-surfaces are crowded into the contact. All these closure-surfaces on the same part are faces in the same direction, so that all tend to crowd toward the same direction, and pressure on any of the exposed surfaces tends to crowd all the closure-surfaces together. The surface-forming closures on the valve-seat and pressure-plate are sometimes greater than the surfaces directly exposed to the steam for keeping these surfaces in contact. I find, however, that the area of exposed surfaces required is not as great as that forming the closure on the seats. Taking, for example, the parts as shown in Fig. 4, the surfaces  $a^{15}$  and  $b^{15}$  are greater than the surfaces  $a^{16}$  and  $b^{16}$ . I have found it desirable to assure full steam-pressure in ports  $a$  when the valve is in its extreme positions and have provided the small auxiliary ports  $a^{14}$  between the closure in the end bridge-pieces and the ports  $a$ . It will permit any steam that may force its way between the valve-surfaces on the end bridge-pieces and their seats to leak through, so as to prevent the unbalancing that would otherwise occur. These will deliver steam to the ports  $a$  until the valve reaches the position shown in Fig. 5. I depend on the smaller exposed areas holding the parts to their seats while the valve is subjected to the compression. This will occur in the bridge-pieces  $a^5$  and  $b^5$ , as shown in Fig. 6, and just succeeding this position. While this smaller area accomplishes the purpose, it does not exert the pressure and consequent friction that an equal exposure would. The sides of the parts have the longitudinal grooves  $c$   $c$ , in which are placed the closure-strips C, as commonly.

What I claim as new is—

1. A steam-engine valve comprising two parts having a series of overlapping surfaces forming closures along the faces of the parts,



the overlapping surfaces of one part facing in one direction and those of the other part in the opposite direction whereby the steam-pressure tends to move one part in one direction and the other part in the opposite direction to effect a closure of overlapped surfaces.

2. A steam-engine valve comprising two parts having a series of corresponding ports therethrough and corresponding bridge-pieces at the sides of the ports said bridge-pieces having overlapping surfaces forming closures the overlapping surfaces of one part facing in one direction and those of the other in the opposite direction.

3. A steam-engine valve comprising two parts having corresponding bridge-pieces across them the bridge-pieces of one part having offsets and the corresponding bridge-pieces of the other part having oppositely-arranged offsets the offset portions of one part overlapping the corresponding offset portions of the other forming closures in the bridge-pieces, whereby the steam-pressure tends to move one part in one direction and the other part in the opposite direction to effect a closure along the overlap, being portions of the offsets.

4. A steam-engine valve comprising two parts having a series of corresponding ports therethrough and corresponding bridge-pieces at the sides of the ports, the bridge-pieces of one part having offsets in one direction and the bridge-pieces of the other part having offsets in the opposite direction, the offsets having overlapping surfaces forming closures at the sides of one of the ports and the walls of the ports in one part being approximately in line with the walls of the corresponding ports in the other part whereby the steam-pressure tends to move one part in one direction and the other part in the opposite direction to effect a closure along the bridge-courses.

5. A steam-engine valve comprising two parts having main ports therethrough near the ends of the valve forming bridge-pieces across the ends of the valve the bridge-pieces of one part having offsets and the pieces of the other part having oppositely-arranged offsets, the offsets having overlapping surfaces forming closures at the bridge-pieces said bridge-pieces also having auxiliary ports between the closures at the main ports and communicating with the main ports.

6. A steam-engine valve comprising the parts A and B having the ports  $a$  and  $a'$  therethrough forming the bridge-pieces  $a^2$ ,  $a^3$ ,  $a^4$ ,  $a^5$ ,  $a^6$ , and  $a^7$ , in part A and corresponding bridge-pieces  $b^2$ ,  $b^3$ ,  $b^4$ ,  $b^5$ ,  $b^6$ , and  $b^7$ , in the part B the bridge-pieces on the part A having the offsets  $a^8$ ,  $a^9$ ,  $a^{10}$ ,  $a^{11}$ ,  $a^{12}$ , and  $a^{13}$ , all arranged at the same side of the bridge-pieces and the bridge-pieces on the part B having offsets  $b^8$ ,  $b^9$ ,  $b^{10}$ ,  $b^{11}$ ,  $b^{12}$ , and  $b^{13}$ , all on the

same side of the bridge-pieces and arranged oppositely to those on the part A the sides of the offsets forming overlapping surfaces which close the bridge-pieces and the strips C for closing the sides of the valve.

7. In a steam-engine valve the combination of two parts arranged to permit a movement of the valve-surface to their seats said parts having ports therethrough and bridge-pieces at the sides of the ports and a means for effecting a closure along the bridge-pieces by contact of closure-surfaces and arranged to maintain said contact between said surfaces through the action of the steam-pressure.

8. A steam-engine valve comprising two parts, each having exterior seating-surfaces and surfaces between the parts exposed to steam-pressure for pressing the seating-surfaces outwardly, the seating-surfaces being greater than the exposed surfaces.

9. A steam-engine valve comprising two parts having a series of ports therethrough and bridge-pieces between the ports, said parts having outer exposed seating-surfaces and surfaces between the parts exposed to steam-pressure and tending to separate the parts, the seating-surfaces being greater than the exposed surfaces between the parts.

10. A steam-engine valve comprising two corresponding parts with ports continuing therethrough and bridge-pieces between the ports; the bridge-piece of the one part overlapping by the corresponding bridge-piece of the other part, the lapped portions being in contact and forming a closure at the sides of the ports, the parts of the valve having outer seating-surfaces; and surfaces exposed to the steam between the ports; the exposed surfaces tending to separate the parts, and the seating-surfaces being greater than the exposed surfaces.

11. A steam-engine valve comprising two parts having a series of overlapping surfaces forming closures along the faces of the parts, the overlapping surfaces of one part facing in one direction and those of the other part in the opposite direction, whereby the steam-pressure tends to move one part in one direction and the other part in the opposite direction to effect a closure of overlapped surfaces, the said parts of the valve having exposed seating-surfaces; and exposed surfaces between the parts tending to separate the parts, the seating-surfaces being greater than the exposed surfaces.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE E. RIBLET.

Witnesses:

M. C. SULLIVAN,  
H. S. LORD.