

(No Model.)

B. T. BABBITT.
BALANCED ROTARY VALVE.

No. 269,992.

Patented Jan. 2, 1883.

Fig. 1.

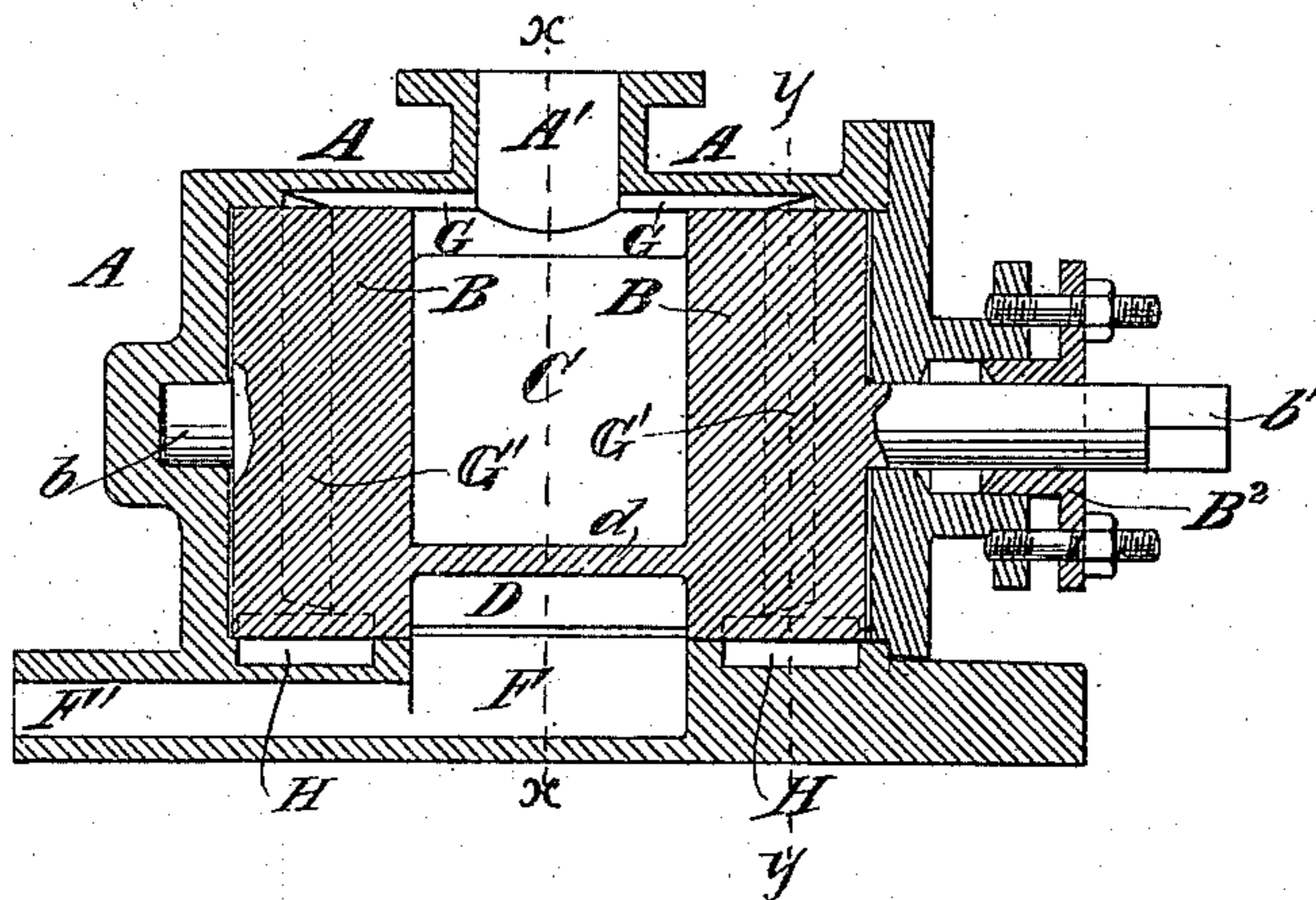


Fig. 2.

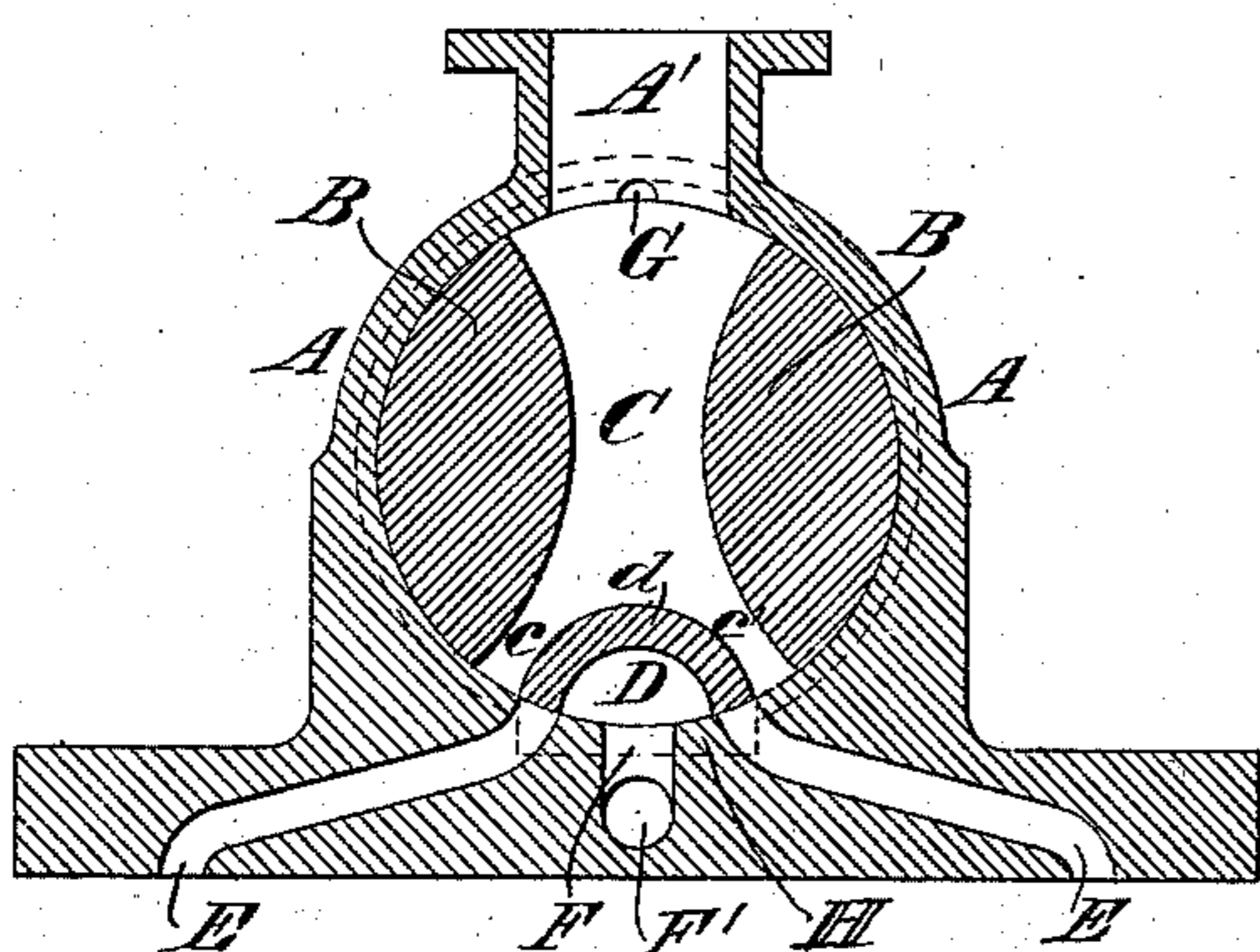


Fig. 3.

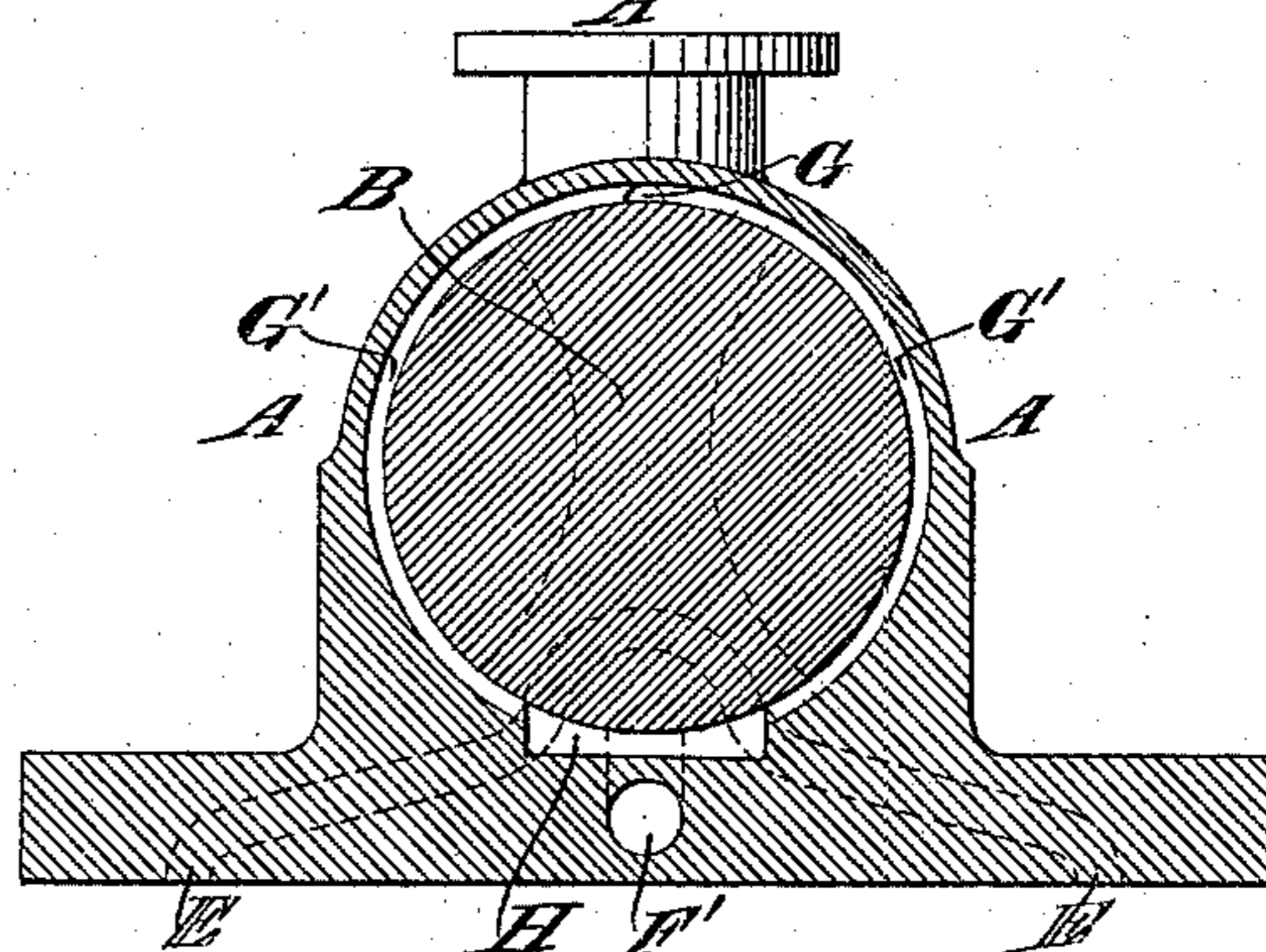
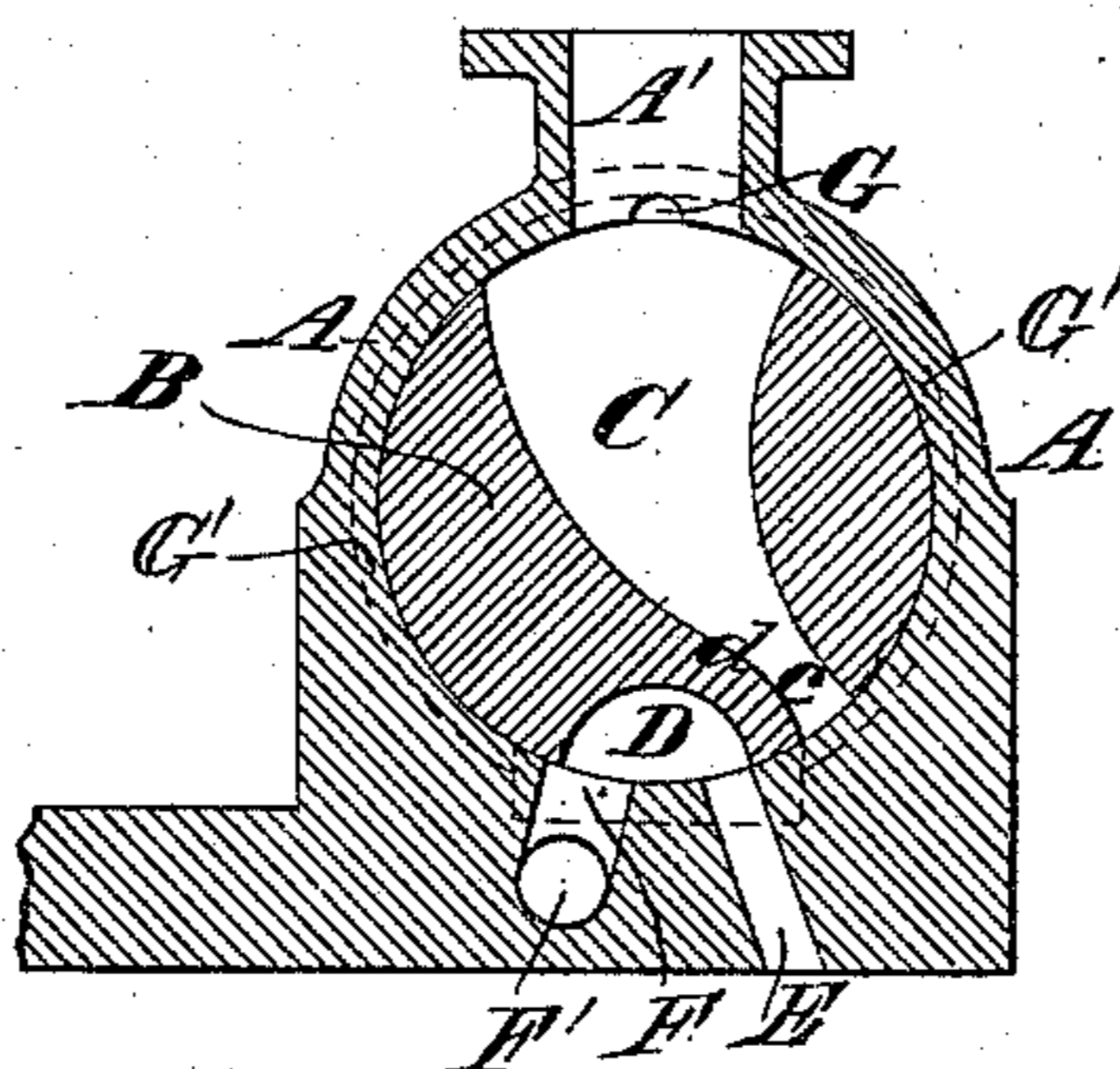


Fig. 4.



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UNITED STATES PATENT OFFICE.

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BALANCED ROTARY VALVE.

SPECIFICATION forming part of Letters Patent No. 269,992, dated January 2, 1883.

Application filed October 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN T. BABBITT, a citizen of the United States, residing in the city, county, and State of New York, have invented new and useful Improvements in Balanced Rotary Valves for Steam-Engines, of which the following is a specification.

My invention relates to improvements in balanced valves for steam-engines, and it particularly relates to that class of valves commonly known as "oscillating" valves, for effecting the induction and eduction of steam to and from the cylinder.

The object of my invention is to balance such valves by causing the steam from the boiler to exert its pressure on the under side of or face of the valve, to counteract the pressure exerted by the steam entering the valve, valve-chest, or casing by the induction-pipe.

My invention consists in the combination, with an oscillating steam-valve having an inlet-passage, a port or ports, and a bridge, of a valve casing or shell formed with longitudinal passages leading from the steam-inlet, balancing-cavities arranged on each side of the port or ports in the valve and on the under side of the valve, or on the opposite side thereof to the steam-inlet, and annular passages extending from the longitudinal passages to the said cavities, all in such manner that steam is conveyed from the inlet to the passages and cavities for balancing the valve, as will be more fully hereinafter explained.

In most cases I prefer to employ a balancing-cavity on each side of the ports, with corresponding passages leading from the inlet. The balancing cavity or cavities should be of an area equal, or nearly so, to the area of the surface of the valve exposed to the action of the incoming steam.

The accompanying drawings form part of this specification, and illustrate what I consider the best means of carrying out my invention.

Figure 1 is a central vertical section of a valve case or cylinder and valve with my improvements applied thereto and adapted to admit and exhaust steam alternately to both ends of the cylinder. Fig. 2 is a cross-section on the line $x x$ in Fig. 1. Fig. 3 is a corresponding cross-section on the line $y y$ of Fig. 1. Fig. 4 shows a cross-section of a valve case or

cylinder and valve with my improvements applied thereto and adapted for the admission and exhaust of steam from one end of the cylinder.

In each of the views similar letters of reference are employed to indicate corresponding parts wherever they occur.

A represents the valve chest or casing, and B the valve. The valve B may be of cylindrical form, as shown in Figs. 2 and 3, or conical, and is provided with spindles or journals $b b'$ —the one received into a bearing in one end of the valve chest or casing, while the other works in and through a suitable stuffing-box, B^2 , in the other end. A' is the inlet for steam from the boiler, by means of which the steam is conducted to the inlet-passage C, which is provided with a passage formed centrally through the valve, and which is large enough at its upper mouth or end to allow of free access of steam thereto from the inlet-passage at all times, irrespective of position of the valve B. At its lower end the passage C, according to the arrangement shown by Figs. 1, 2, and 3, is divided into two ports, $c c'$, by the interposition of the curved portion or bridge d , forming the exhaust-cove D.

E E are ports formed in the valve chest or casing, and leading to the opposite ends of the engine-cylinder, for the induction and eduction of steam thereinto, and each of which in the operation of the valve is alternately brought into communication with its respective port c or c' , for the admission of steam to one end or other of the steam-cylinder, or with the cove D, for the purpose of exhausting the steam, which is then led away by the exhaust-port F and exhaust-passage F' , as is well understood.

G G are small passages or channels, formed in the upper side of the interior of the case or cylinder A, on each side of the main ports, for the purpose of conducting steam from the inlet-passage A' to circular passages $G' G'$, formed around the inner periphery of the case or cylinder A, and which terminate in both directions in a balancing-cavity, H, formed in the casing A on the under side of the valve B, or on the opposite side to that at which the pressure of the inlet-steam is exerted, and on the same side as the ports $c c'$ and cove D. The cavities H are of an aggregate area approximately equal to the area of the surface-bridge

d, and such other portions of the valve A as are exposed to the action of the inlet-steam, in order that the valve may be approximately balanced.

5 In Fig. 4 I have shown the valve B provided with only a single port, *c*, adapted to be alternately closed by the cylinder A or open to the cylinder-port E. The exhaust-port F and exhaust-passage are arranged on one side of the
10 center of the valve and cylinder, while the cylinder-port is on the other side.

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

15 The combination, with an oscillating steam-

valve having the passage C, port or ports *c c'*, exhaust D, and bridge *d*, of the valve casing or shell A, formed with longitudinal passages G G, leading from the inlet A', balancing-cavities H H, arranged on each side of the valve 20 port or ports and on the underside of the valve, or on the opposite side thereof to the inlet, and annular passages G' G', extending from the longitudinal passages to the said cavities, substantially as and for the purpose described. 25

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