

(No Model.)

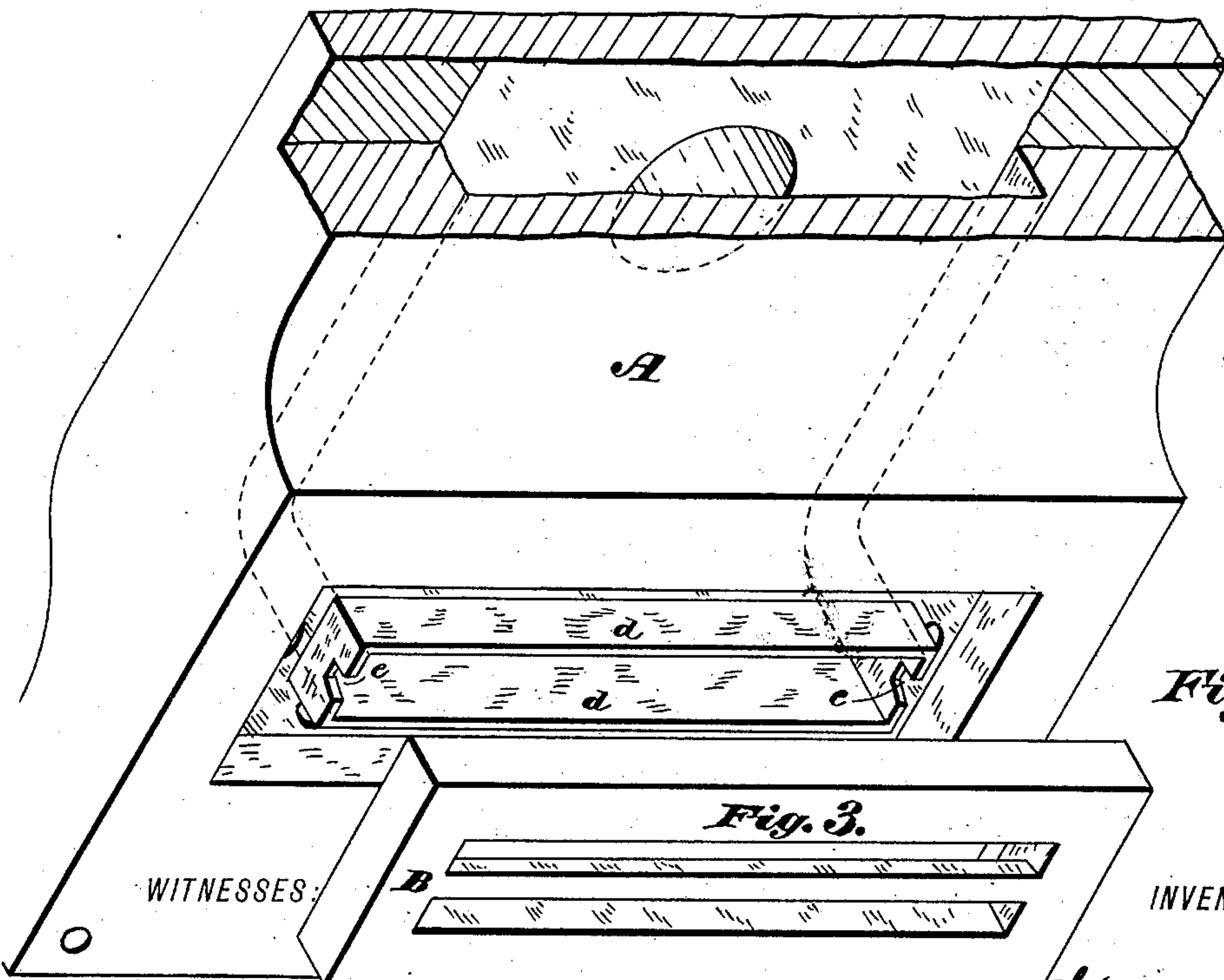
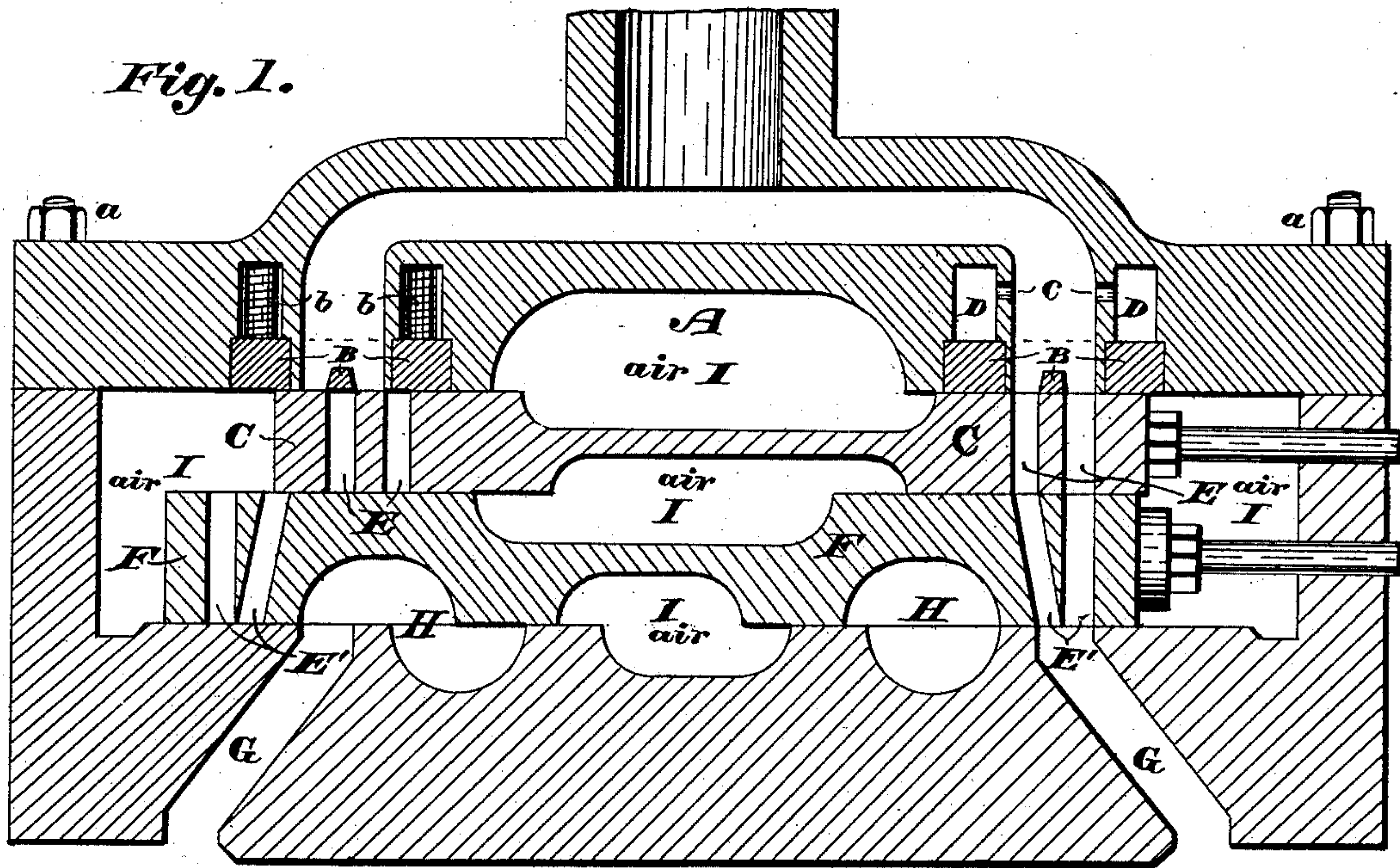
2 Sheets—Sheet 1.

W. F. BERRY.  
BALANCED VALVE.

No. 374,237.

Patented Dec. 6, 1887.

*Fig. 1.*



*Fig. 2.*

*Fig. 3.*

WITNESSES:

*Harry Freese*  
*A. J. Fulmer*

INVENTOR

BY *William F. Berry*  
*Bond & Wise*  
ATTORNEY

(No Model.)

2 Sheets—Sheet 2.

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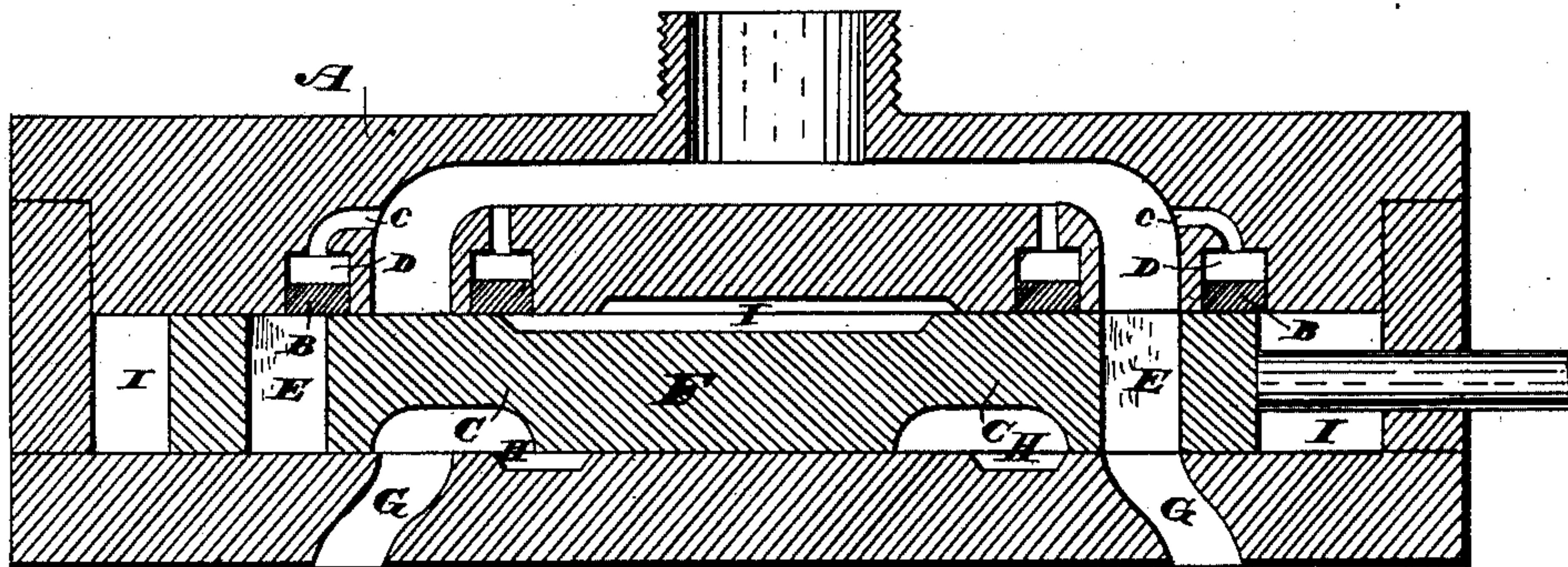


Fig. 4.

WITNESSES:

*Harry Grease*  
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# UNITED STATES PATENT OFFICE.

WILLIAM F. BERRY, OF MASSILLON, OHIO.

## BALANCED VALVE.

SPECIFICATION forming part of Letters Patent No. 374,237, dated December 6, 1887.

Application filed May 25, 1887. Serial No. 239,280. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. BERRY, a citizen of the United States, residing at Massillon, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Self-Balanced Valves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon, in which—

Figure 1 is a longitudinal section showing the different parts in proper position. Fig. 2 is an underside view of a portion of the steam-chest. Fig. 3 is a detached view of the packing. Fig. 4 is a longitudinal section showing packing in contact with single valves.

The present invention has relation to self-balanced valves; and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar letters of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawings, A represents the steam-chest, which may be substantially of the form shown in the drawings. This steam-chest is formed of a single piece of metal, and is securely held in proper position by means of the clamping-bolts *a*.

The packing-plates B are placed on the steam-chest A, substantially as shown in the drawings, and are so adjusted that they will bear or press on the adjacent valve C. These packing-plates are held to the adjacent valve C by means of the springs *b*, a sufficient number of these springs being provided to securely hold the packing-plates B down to said valve C, and at the same time have an even pressure from end to end and side to side.

It will be understood that as many apertures are to be formed in the steam-chest A as there are springs to be used. In case it is desired, the springs *b* may be removed and the packing-plates B held in proper position or receive the desired amount of pressure by means of steam entering the apertures D through the apertures *c*. I prefer, however, to use the spiral springs *b*, as shown in the drawings.

The cut-off valve C may be substantially of the form shown in the drawings, and, as shown, is provided with the steam-ports E. This cut-off valve is actuated by means of an ordinary eccentric-rod.

The valve F may be substantially of the form shown in the drawings, and is provided with the steam-ports E'. This valve is also actuated by an ordinary eccentric-rod.

The eccentric governing the motion of main valve F is secured to main shaft of engine. The eccentric governing the motion of the cut-off valve C is controlled by the governor or regulator.

In Fig. 1 a portion of the steam-cylinder proper is shown with the cylinder-ports G located therein. This cylinder is provided with suitable chambers, which, in connection with suitable chambers in the valve F, form the exhaust-chambers H.

The object and purpose of forming the exhaust-chambers H partly in the cylinder and partly in the valve are to open and close the exhaust-chambers proper by the movement of the valve F.

It will be seen by my peculiar arrangement no live or exhaust steam is permitted to reach or press against the valves C and F except at the foot of the steam-ports located in the steam-chest A, said valves being left free to move in the air-chamber I, and no steam being permitted to enter said air-chamber I, thus avoiding excessive steam-pressure. The valves receive the desired amount of pressure from ports in steam-chest and packing-plates B to hold said valves in proper working position and at the same time prevent their leaking steam.

It will be seen that as the valves become worn from use the packing-plates B will be automatically adjusted to the valves C and F by means of the springs *b* or their equivalents.

It will be understood that the steam-ports located in valves C and F are so adjusted that steam will be permitted to enter the steam-cylinder proper and to cut off the steam in the ordinary manner. It will also be understood that the exhaust-chamber is closed while live steam is entering the working end of the cylinder, and that the exhaust-chamber is open to permit the steam to exhaust from the idle end of the cylinder.



In case it is desired, the cut-off valve C may be removed, or, in other words, the valve F may take the place of the two valves C and F, the exhaust-chambers being partly formed in the single valve and the packing-plates B located substantially the same as when the two valves are used.

The steam-chest A is provided with suitable seats for the packing-plates B. In Fig. 2 only one seat is shown, the two seats and packing-plates being located substantially as shown in Fig. 1.

The projection *d* is for the purpose of assisting in holding in proper position the packing-plate B, the ends of said projection being provided with the notches or recesses *e*, which are for the purpose of receiving the cross in the packing-plate B. I also desire to use the valves C and F with double ports, as shown in Fig. 1, or with single ports near each end.

In case but one or a single valve is used, as shown in Fig. 4, the packing-plates B are placed in such a position that they will press against the valve F, as shown in said Fig. 4.

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

1. The combination of the steam-chest A, formed of a single piece of material and pro-

vided with the apertures for receiving the springs *b*, the packing-plates B, and the valves C and F, substantially as and for the purpose specified.

2. The packing-plates B, located at ports in steam-chest A, the springs *b*, and the valve C, provided with suitable steam-port or steam-ports, substantially as and for the purpose specified.

3. The combination of the steam-chest A, the packing-plates B, the air-chamber I, the valves C and F, said valves being provided with steam-ports, and the exhaust-chamber H, formed partly in the cylinder and partly in the valve F, arranged to admit live steam to the cylinder and release exhaust-steam, substantially as and for the purpose specified.

4. In a balanced valve, the air-chamber I, located between the steam-chest A and the cylinder, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM F. BERRY.

Witnesses:

HOWARD J. WATKINS,  
ALICE GALLAGHER.