

(No Model.)

G. SHONE.

BALANCED SLIDE VALVE.

No. 277,795.

Patented May 15, 1883.

Fig. 1.

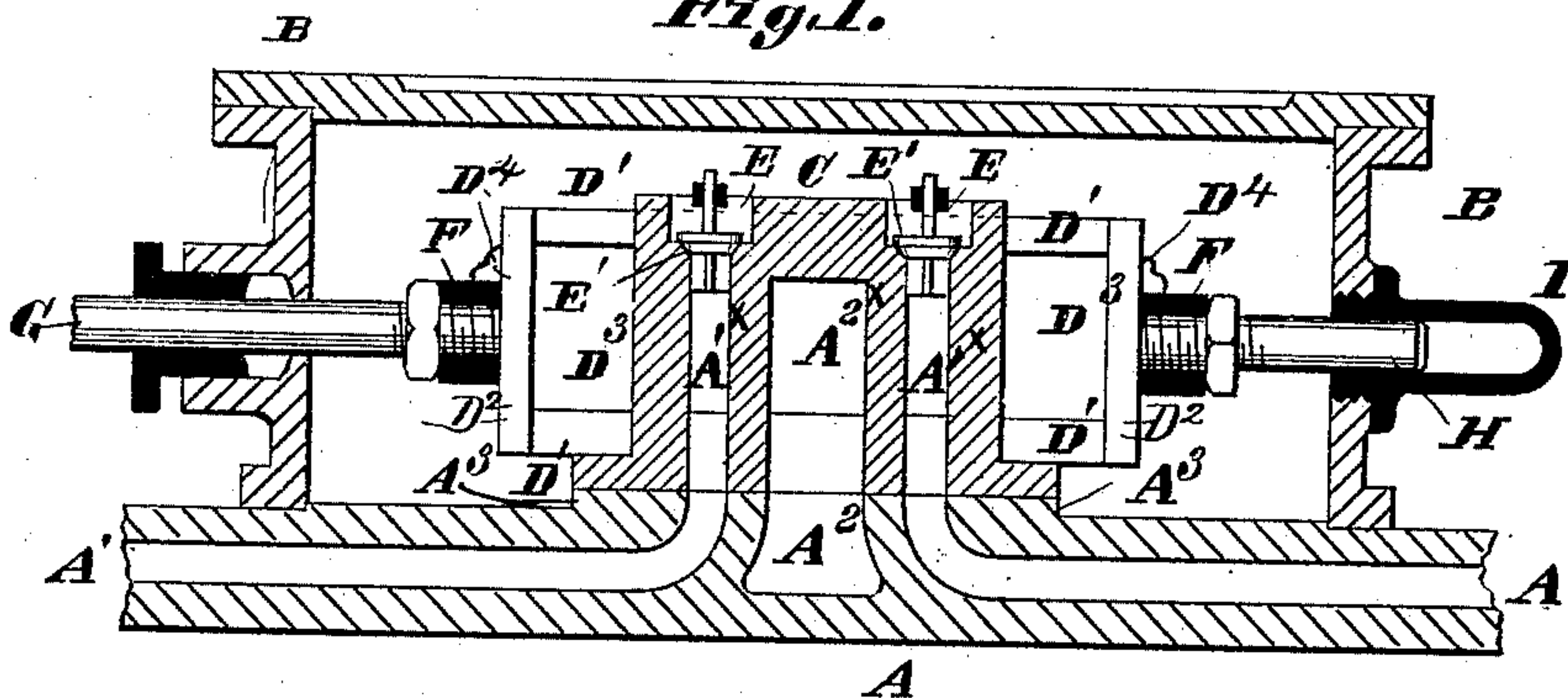


Fig. 2.

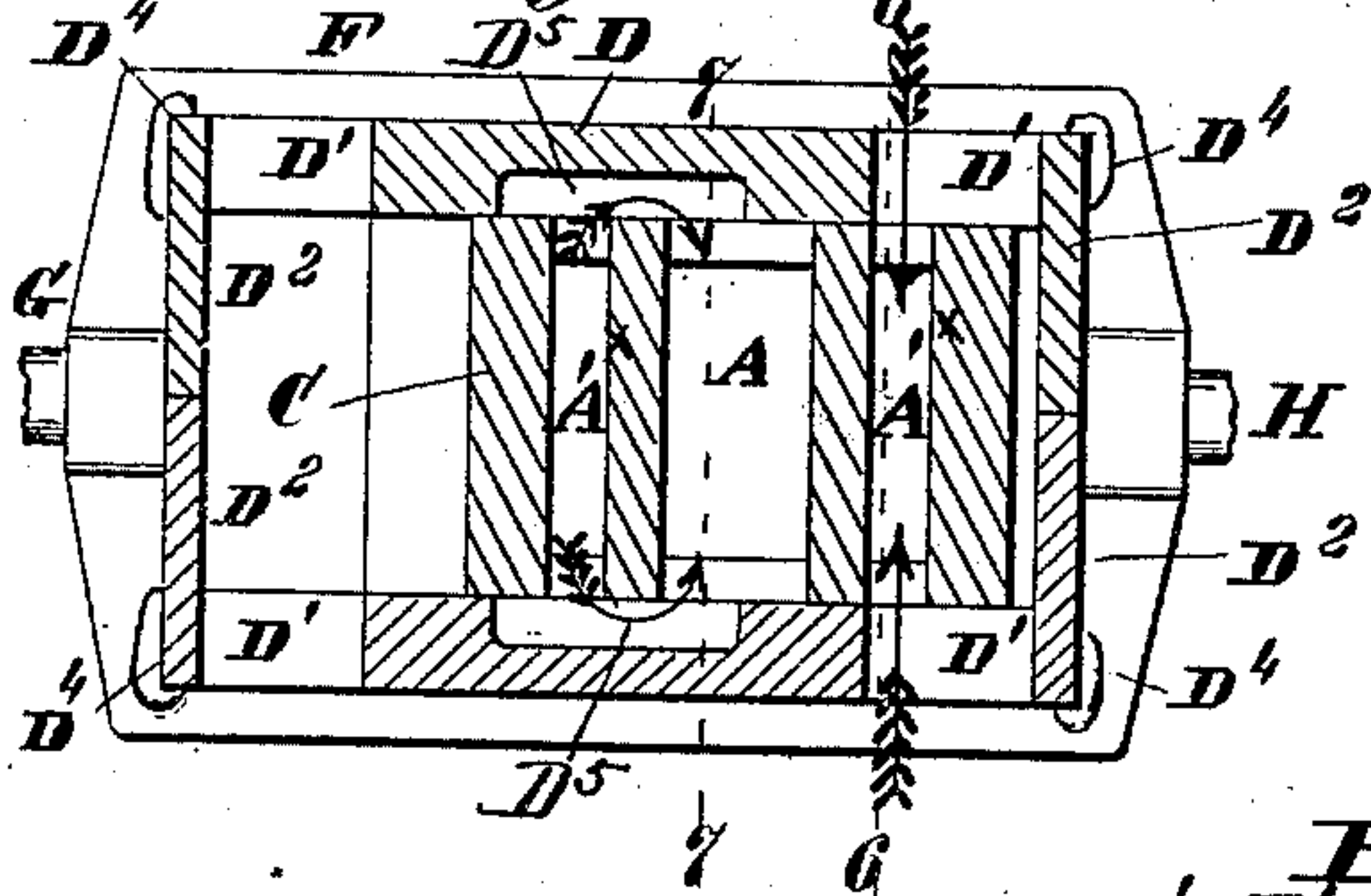


Fig. 3

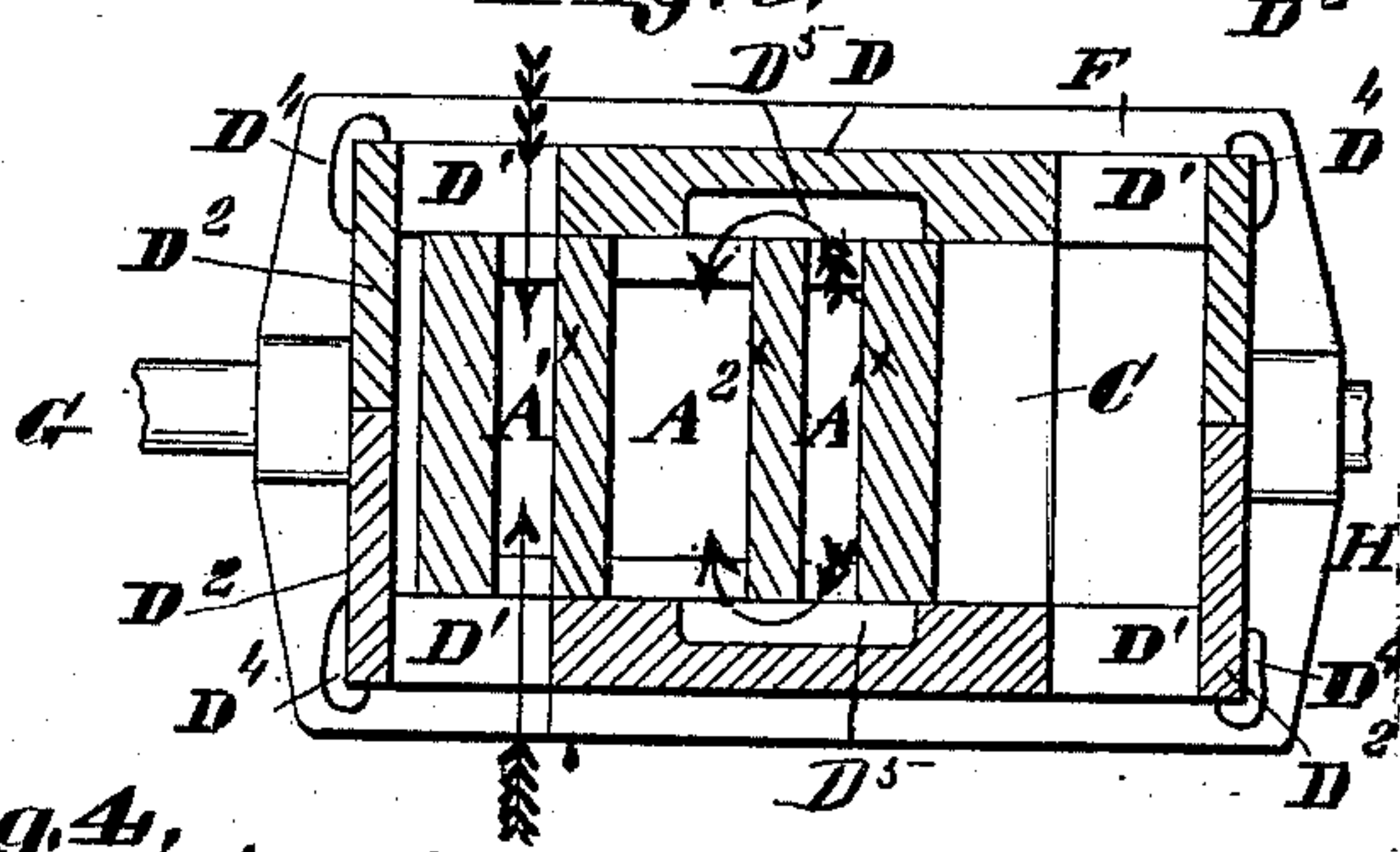


Fig. 4.

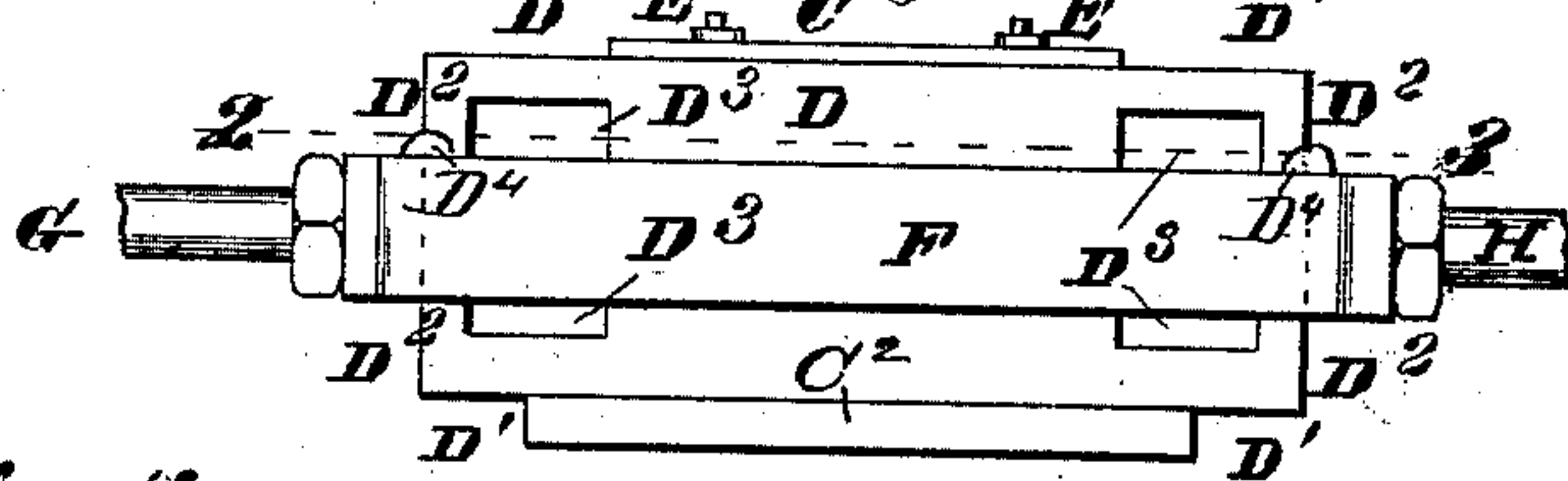


Fig. 5.

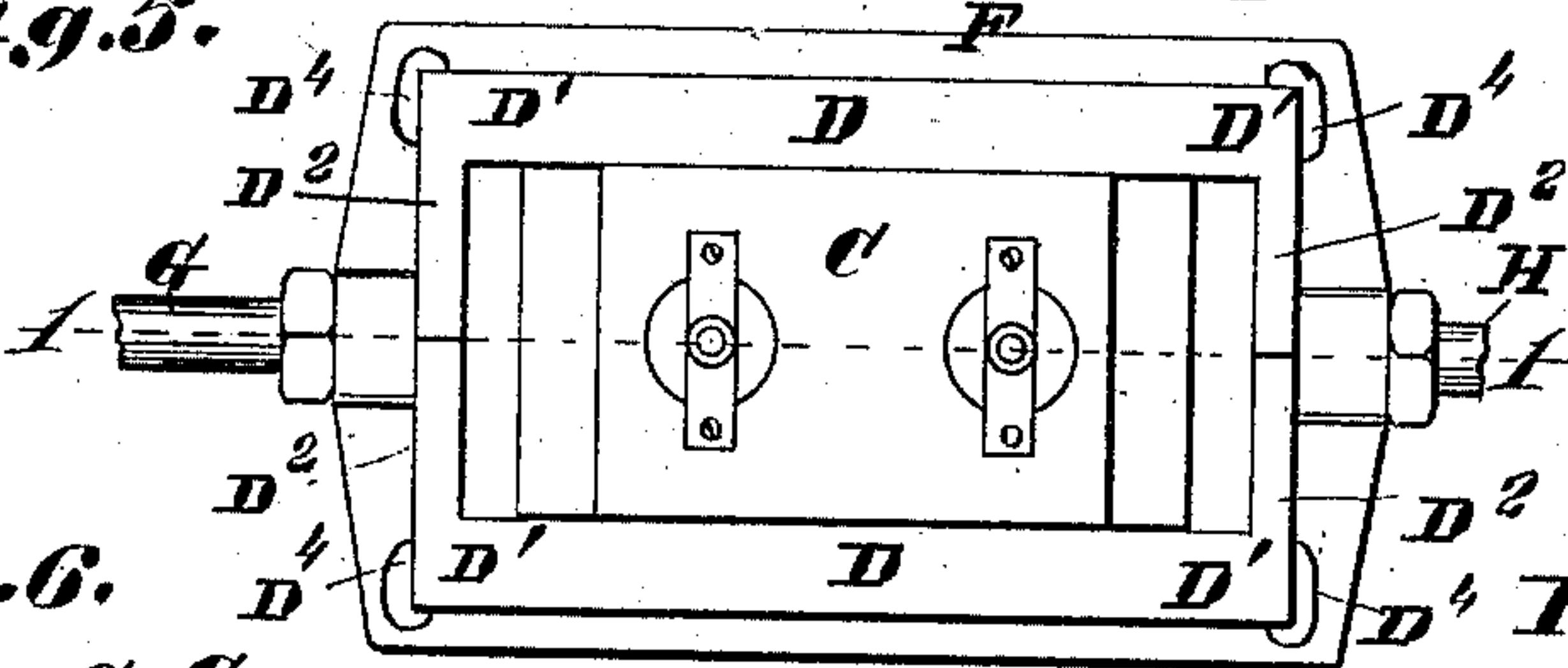
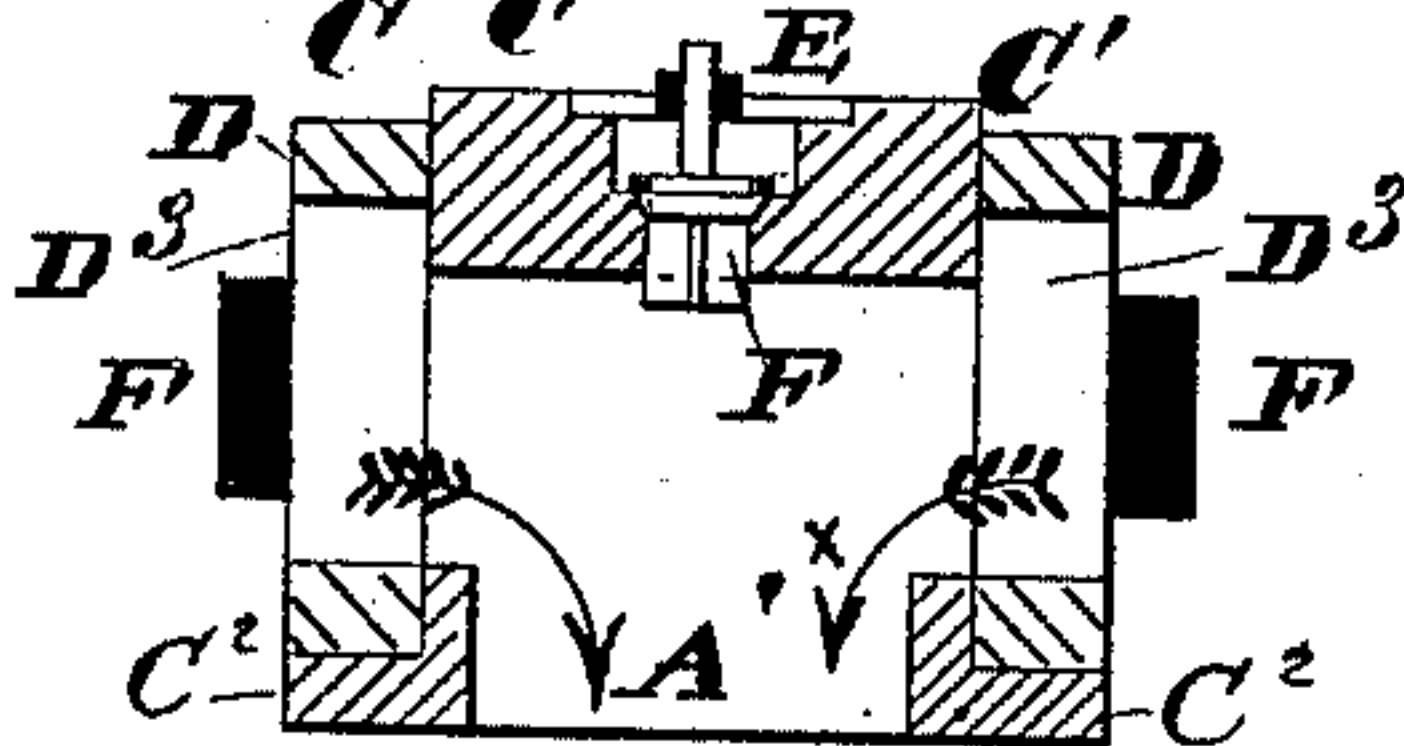
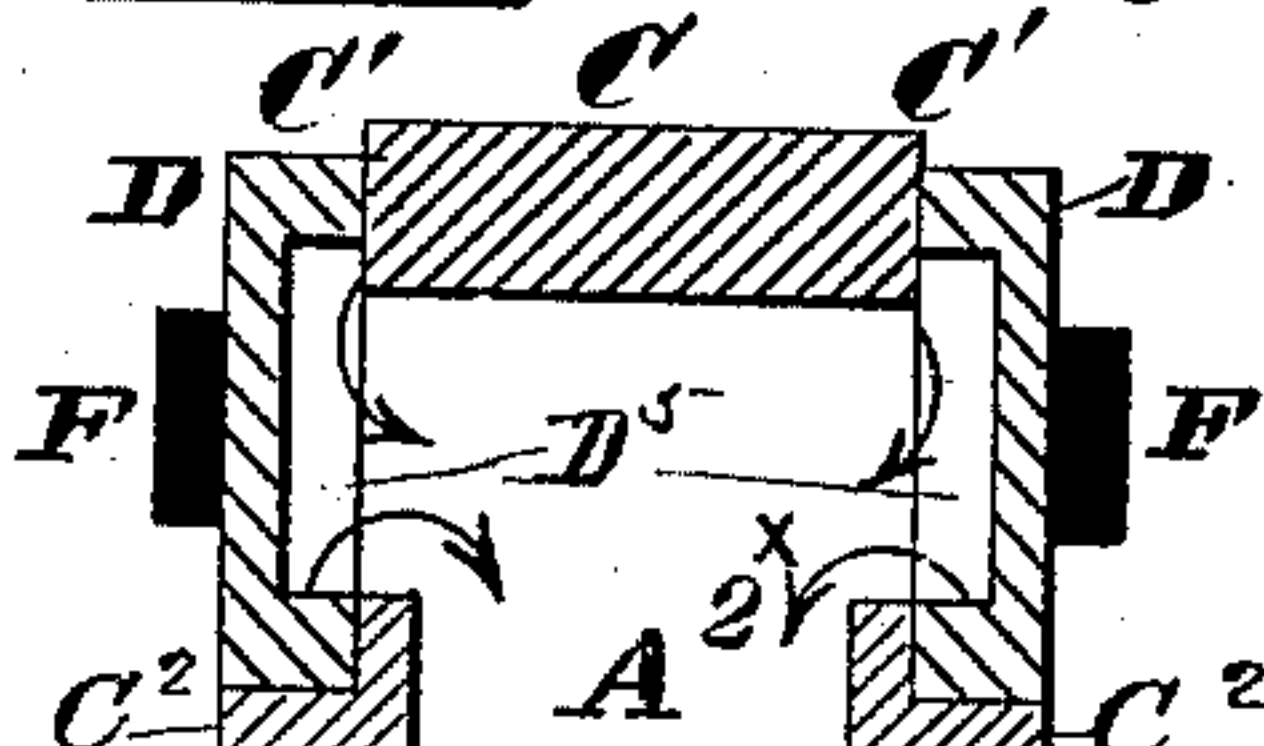


Fig. 6.



F i g. 2.



Attest:

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UNITED STATES PATENT OFFICE.

GEORGE SHONE, OF EAST ST. LOUIS, ILLINOIS.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 277,795, dated May 15, 1883.

Application filed January 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SHONE, of East St. Louis, St. Clair county, State of Illinois, have invented a certain new and useful Improvement in Balanced Slide-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvement consists of a slide-valve having duplicate members working on opposite sides of a valve-seat box or casting, through which the steam-passages extend upward above the usual valve-seat. These members have end extensions that bear one against the other to relieve the working-faces from pressure of the steam upon their outer sides. Valves in the top of the seat-box allow the escape of steam from the exhausting end of the cylinder, if at any time the pressure therein exceeds the pressure in the steam-chest.

Figure 1 is a longitudinal section at 1 1, Fig. 5, the valves in central position. Fig. 2 is a horizontal section at 2 3, Fig. 4, the valves being in position for the cylinder to take steam at one end and exhaust at the other; and Fig. 3 is a similar view, except that the valve is in the reverse position. Fig. 4 is a side view. Fig. 5 is a top view. Fig. 6 is a transverse section at 6 6, Fig. 2. Fig. 7 is a transverse section at 7 7, Fig. 2.

A is part of a steam-engine cylinder, having steam-ports A' and exhaust-port A², as usual.

B is the steam-chest, made high enough to contain the valve-seat box or casting C. The part C may be made separate from the cylinder A and fitted to the ordinary valve-seat, A³, as shown, and made fast thereto by screws; or it may be cast in one piece with the cylinder. The steam-ports A' and exhaust-ports A² extend, as shown at A'^x A'^x and A^{2x}, upward in the seat-box C, and each side of the box is dressed off into a valve-seat, C', substantially similar to that A³, the ports being closed at top, (and open to the sides.)

D is a slide-valve working upon the upright valve-seat C'. The valve proper is of the ordinary D form, but has extensions D' at each end. These extensions or arms carry inwardly-extending bearing-plates D². The valves are made in duplicate, as before stated,

so that the steam-pressure is equal on each, and as the plates D² at both ends bear upon or against each other the valves are perfectly balanced, and may be made to bear upon the seats C' as lightly as may be consistent with tightness of fit, (to prevent the passage of steam between the surfaces in contact.) Any wear in the faces may be provided for by dressing the bearing-edges of the plates D². Between the valve proper, D, the extensions D', and the bearing-plate D² is an orifice, D³, through which the live steam enters the port A', there being four of these orifices—one at each end of each of the duplicate valves.

In the seat-box C are valve-ports E, extending upward from the steam-ports A' to the steam-chest chamber, and supplied with upwardly-opening valves E', forming relief-valves for the steam in the exhausting end of the cylinder, if it at any time exceeds in pressure that of the live steam in the steam-chest.

F is a yoke surrounding the valves. G is the valve-stem, giving means for the working of the valves in the usual manner.

H is a horn entering the socket-bearing I, and serving to support that end of the yoke.

The valves may be carried by the yoke, or may have bearing solely upon the flange C² of the valve-seat box C, or upon raised bearings upon said flange. Where the valves are supported on the yoke they are made with lips D⁴ bearing thereupon.

It will be seen that the ports A' and A² in the valve-seat box D do not extend down to the lower edges of the valves D. Thus leakage of steam beneath the valves is prevented.

The operation of my improvement is as follows: When the valves are in either of the positions shown in Figs. 2 or 3 the live steam enters the valve-seat box horizontally and descends through the port A' into the cylinder. (See Figs. 2 and 6.) The exhaust-steam escapes from the other end of the cylinder through the port A', chamber D⁵ of the valve, and through the exhaust-passage A².

I claim—

1. In combination with a cylinder having steam-ports A', a central exhaust-port, A², and a suitable steam-chest, of a valve-seat box having extensions A'^x A'^x and A^{2x} to the steam and exhaust ports, open at sides, and ports E, communicating with the extensions A'^x A'^x,

provided with valves E' E' to relieve the exhaust-steam when at greater pressure than that within the steam-chest, as set forth.

2. The combination of seat-box having steam
5 and exhaust port extensions and valve - seats at the sides, a slide-valve having extensions D' at each side, inwardly-extending bearing-plates

D², openings D³, and chambers D⁵, and a yoke, F, substantially as set forth.

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Witnesses:

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