

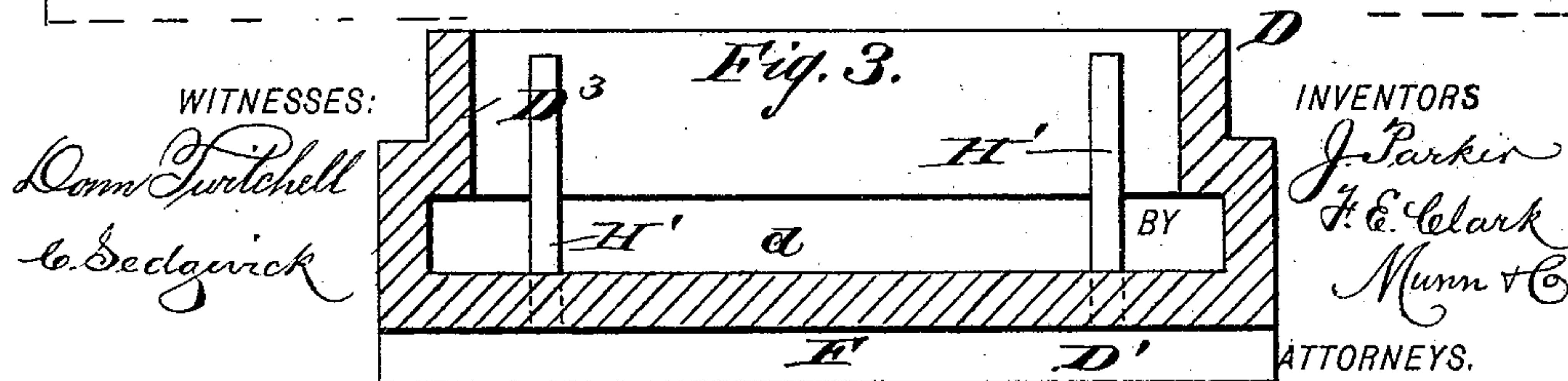
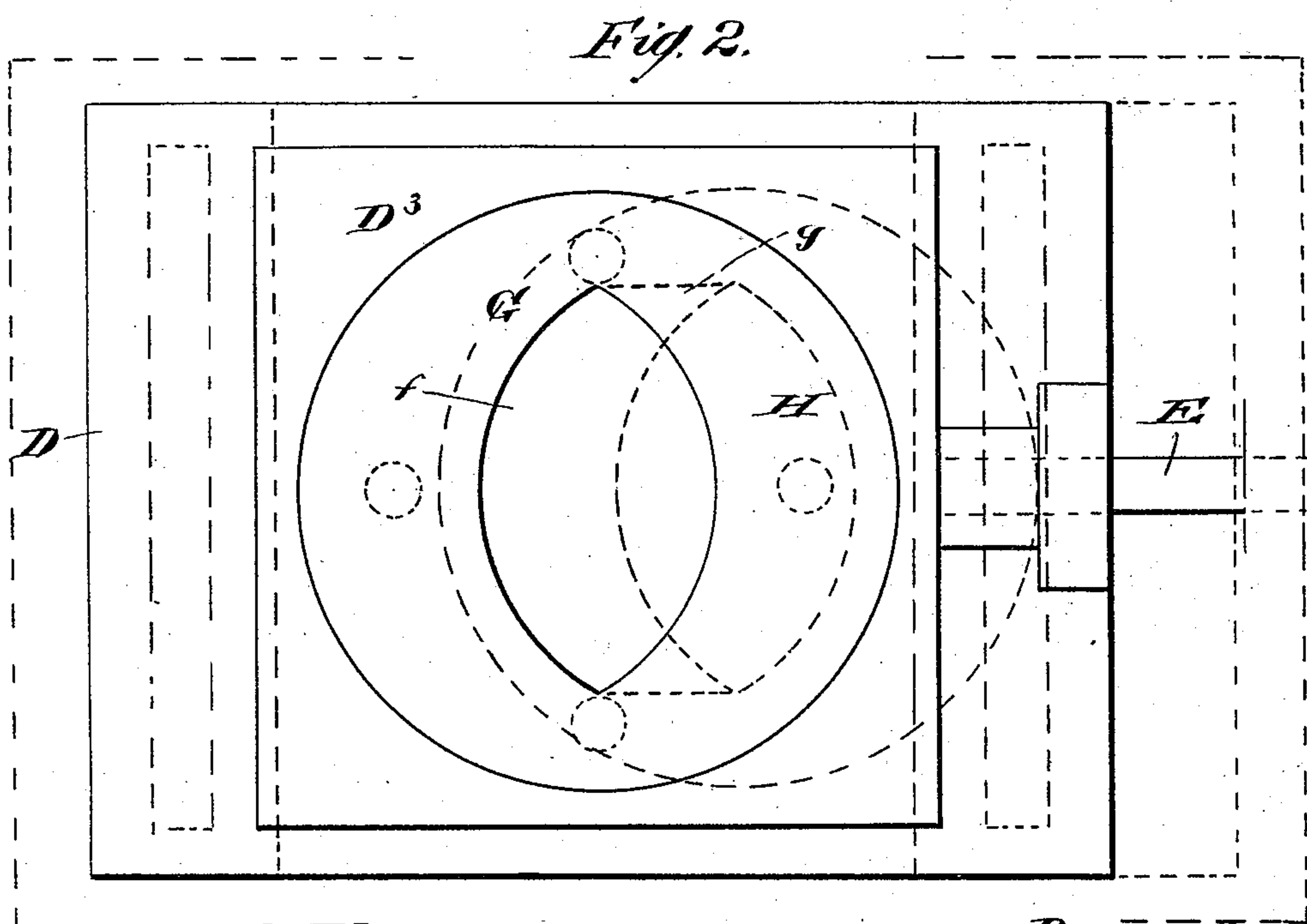
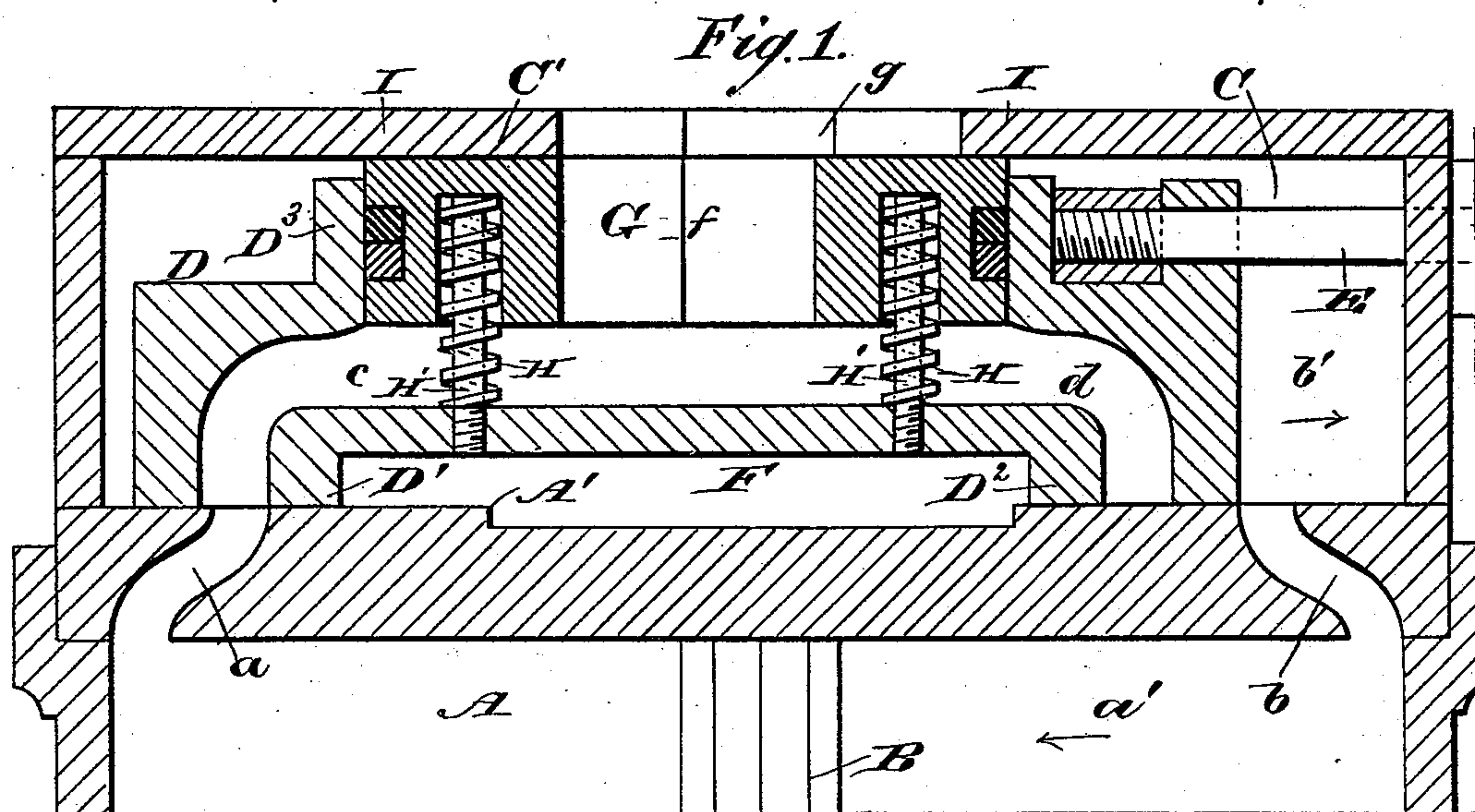
(No Model.)

2 Sheets—Sheet 1.

J. PARKER & F. E. CLARK.
BALANCED SLIDE VALVE.

No. 487,962.

Patented Dec. 13, 1892.



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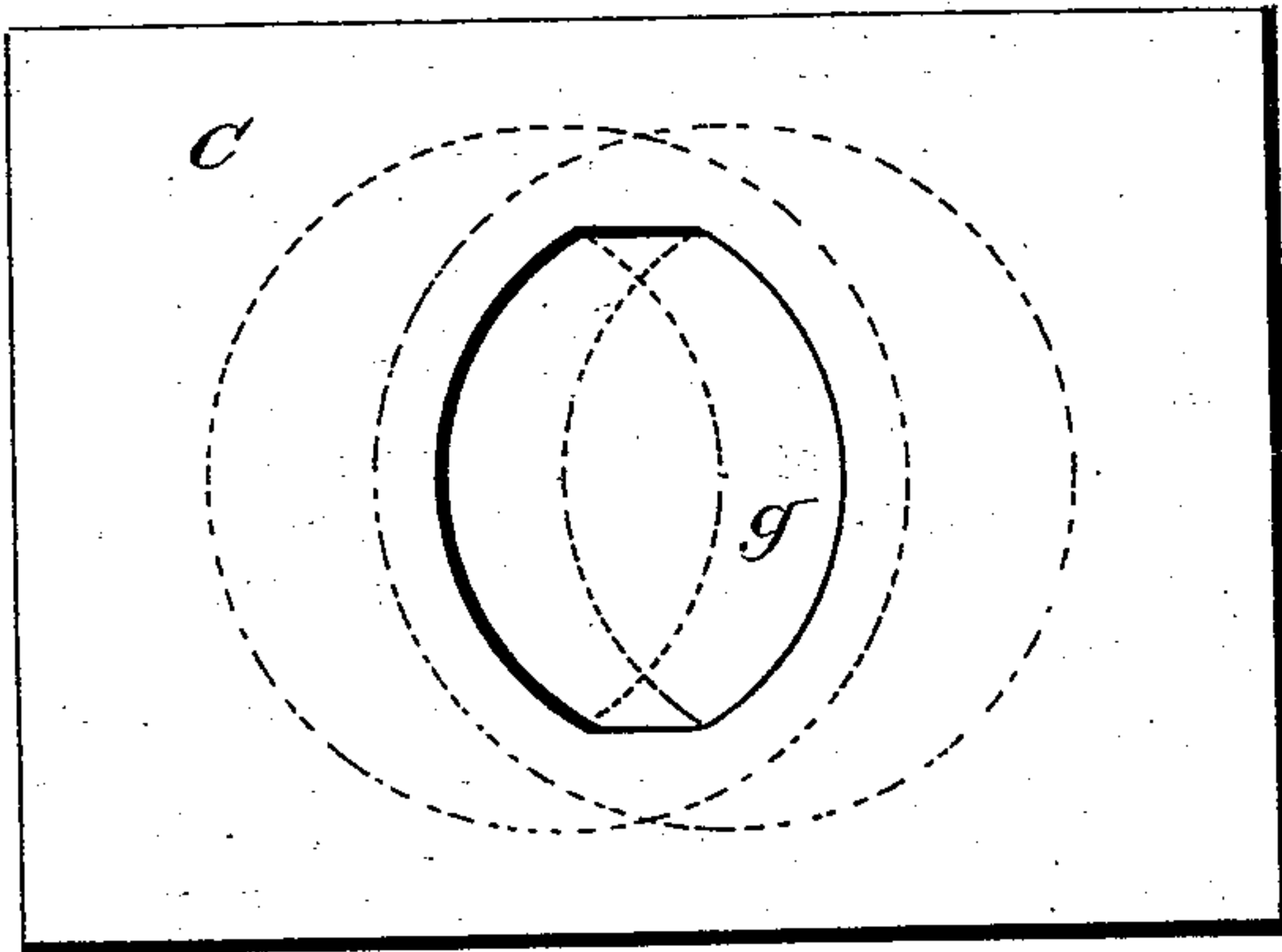
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Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN PARKER AND FRED E. CLARK, OF STURGEON FALLS, CANADA.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 487,962, dated December 13, 1892.

Application filed February 18, 1892. Serial No. 421,975. (No model.)

To all whom it may concern:

Be it known that we, JOHN PARKER and FRED E. CLARK, both of Sturgeon Falls, in the Province of Ontario and Dominion of Canada, have invented a new and Improved Balanced Slide-Valve, of which the following is a full, clear, and exact description.

Our invention is an improvement in a class of balanced valves which consist, mainly, of a slide-valve proper having in its upper portion a centrally-arranged and vertically-movable disk provided with an exhaust-steam passage and supported by springs.

The construction and combination of parts constituting our invention are as hereinafter described.

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

Figure 1 is a sectional side elevation of the improvement as applied. Fig. 2 is a plan view of the valve, the cover of the steam-chest being removed. Fig. 3 is a transverse section of the valve with the balance-disk removed. Fig. 4 is a plan view of the central portion of the cover of the steam-chest.

The cylinder A is provided with the usual piston B and with the inlet-ports *a* and *b*, leading to the steam-chest C, containing the valve D, connected with a valve-stem E, for imparting a sliding motion to the said valve in the usual manner. The valve D is provided at its under side and near the ends thereof with two projections D' and D², respectively, seated on the seat A' on top of the cylinder to operate over the ports *a* and *b* in such a manner that when the projections uncover the said ports *a* and *b* they take live steam from the interior of the steam-chest. The projections D' and D² form on the under side a transversely-extending recess F, which communicates at its ends with the interior of the steam-chest, so that live steam can pass from the latter to the under side of the valve D to press thereon. In the projections D' and D² are also formed two exhaust-ports *c* and *d*, respectively, adapted to alternately register with the ports *a* and *b*, respectively. The ports *c* and *d* terminate in a common port *e*, registering with an opening *f* of almond shape, as is plainly shown in Fig. 2. This opening

f is formed in the middle of a balance piston-disk G, fitted to slide vertically in a cylinder D³, formed in the top of the valve D, as is plainly shown in the drawings. The balance-disk G is pressed upward by springs H, held in suitable recesses in the under side of the said disk, the springs being coiled on rods H', secured in the bottom of valve D and resting on the upper surface of the said valve-bottom. The springs H force the top surface of the balance-disk G into contact with the inner surface of the cover C' of the steam-chest C, thus forming a steam-tight joint between the two parts.

The opening *f* in the disk G registers at all times with an opening *g*, formed in the cover C' of the steam-chest C, the said opening *g* being connected with the usual exhaust-pipe. (Not shown.) Two opposite sides of the opening *g* are straight, (see Fig. 4,) and the other opposite sides are curved to correspond with the sides of the opening *f* in disk G. The length of the straight or parallel sides of opening *g* corresponds with the length of travel of the valve, so that the exhaust remains uniform during such period.

In the periphery of the balance-disk G are held expansion packing-rings I, pressing against the inner surface of the annular flange D³, so as to establish a steam-tight joint in the said flange.

The operation is as follows: When the valve D is in the position shown in Fig. 1, the port *b* is uncovered and the motive agent can pass from the steam-chest C into the cylinder A at the right-hand end thereof to act on the piston B, so as to force the latter in the direction of the arrow *a'*. The motive agent on the exhaust side of the piston B passes through the port *a* into the exhaust-port *c* of the valve D and then into the openings *e* and *f*, to finally pass through the opening *g* into the exhaust-pipe and to the outer air. The other exhaust-port *d* is then closed, as is plainly shown in Fig. 1. When the valve D reverses—that is, travels in the direction of the arrow *b'*—the port *a* is uncovered by the projection D', while the projection D² brings the port *d* to register with the port *b*. The motive agent from the steam-chest then passes through the port *a* to act on the piston B to cause the latter to travel in the inverse di-

recession of the arrow a' . The exhaust then takes place through the port b , the port d , openings e , f , and g , it being understood that the opening g is of sufficient size to register at all times with the opening f .

5 The area of the projections D' and D^2 is about equal to the area of the top surface of the balance-disk G , so that the pressure on the balance-valve is equal, and consequently
10 the valve is completely balanced.

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

15 The combination, with the steam-chest having the flat cover C' , provided with an exhaust-steam opening g , of the slide-valve D ,

having the exhaust-ports c and d and the exhaust-recess F in its under side, the balance piston-disk G , adapted to slide vertically in the top of the valve D and having an elliptical opening f , arranged correspondingly with the aforesaid opening g in the cover C' , the rods H' H' , projecting into recesses in the opposite sides of the disk, and springs encircling said rods and supporting the disk, as
20 shown and described. 25

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Witnesses:

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