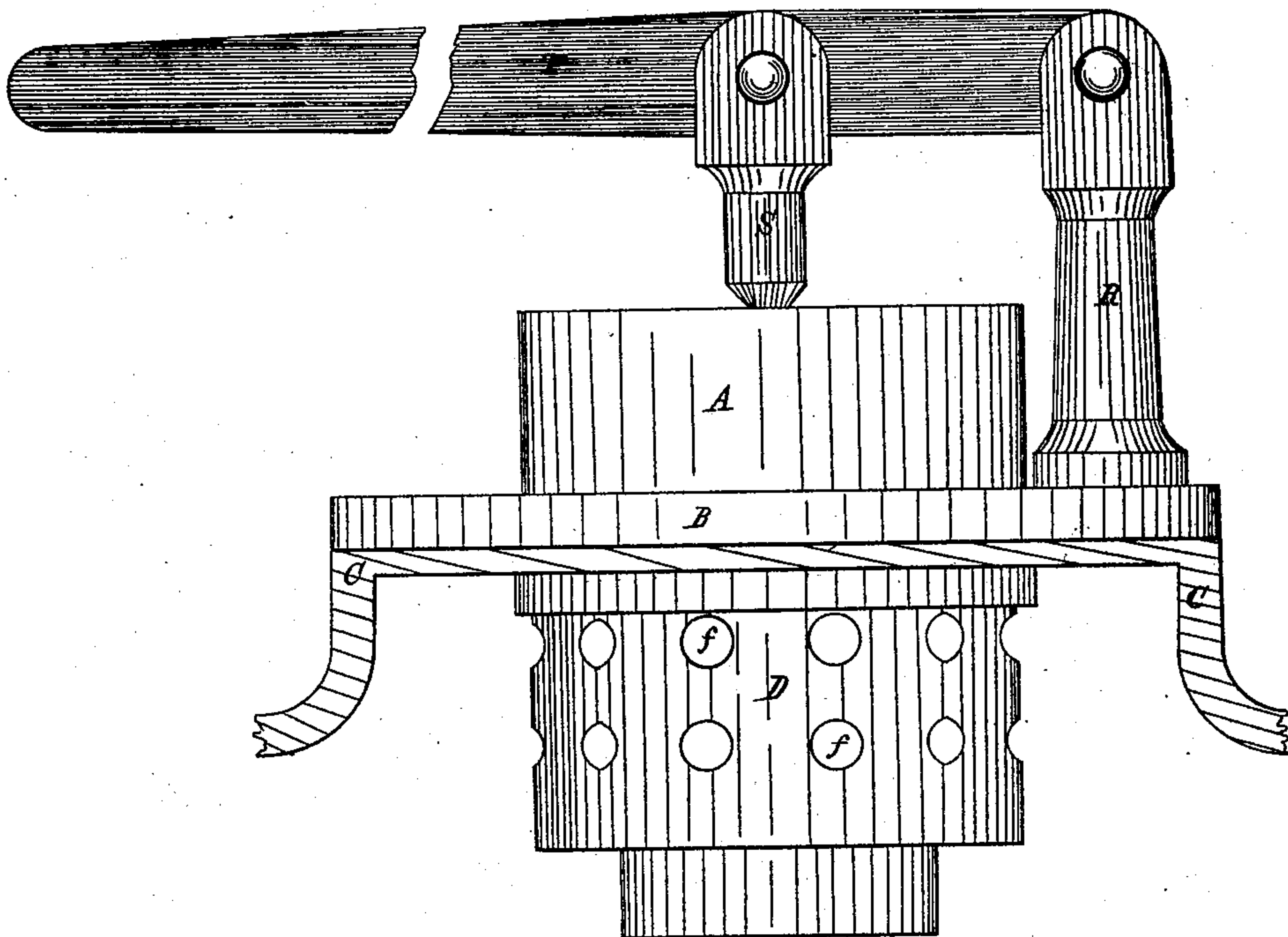


S. B. DOUGHERTY.
SAFETY VALVE.

No. 75,392.

Patented Mar. 10, 1868.

Fig. 1.



WITNESSES.

A. O'Keefe
Louis Kolber

INVENTOR.

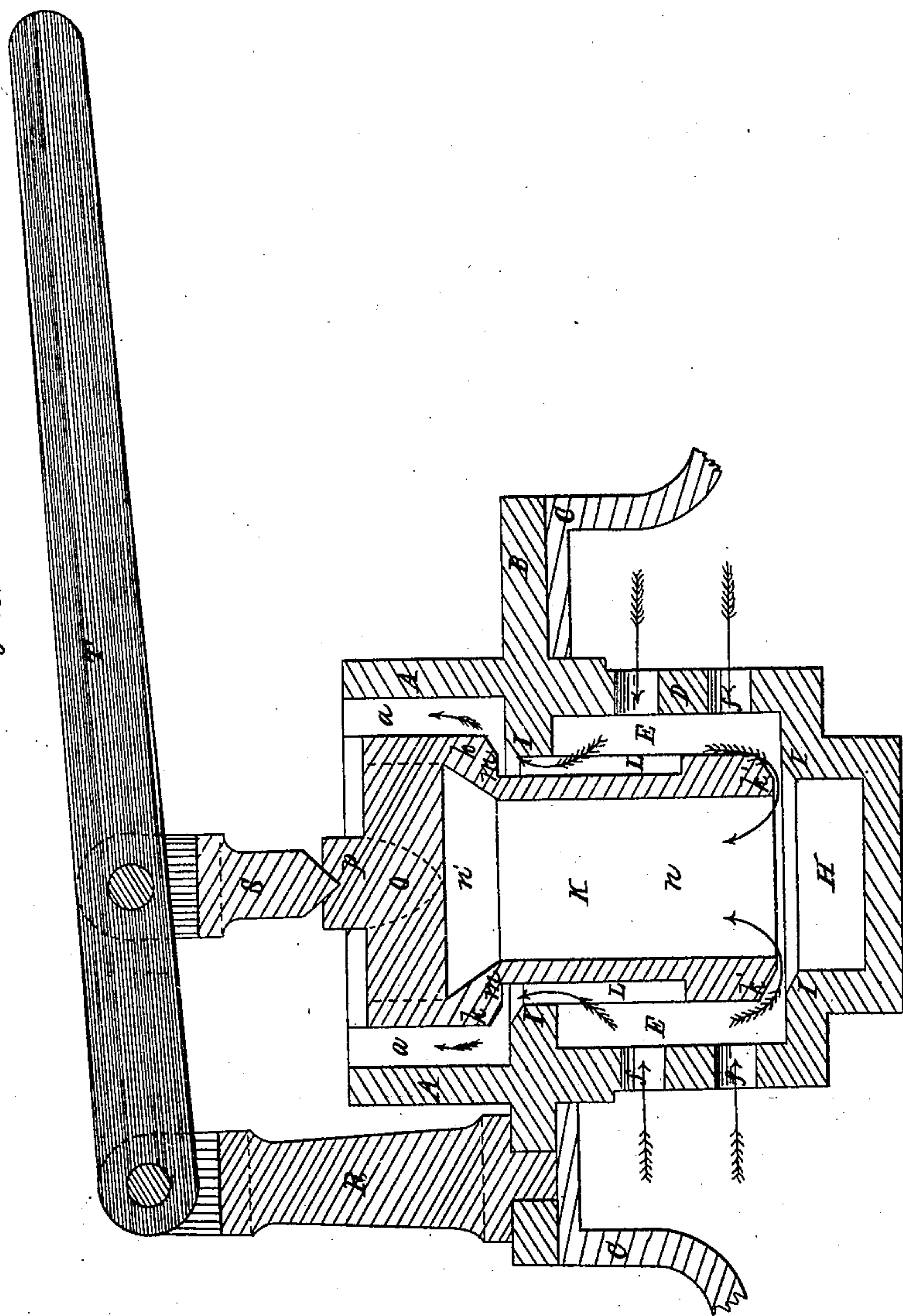
S. B. Dougherty

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SAFETY VALVE.

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Fig. 2.



WITNESSES.

A. O'Neil
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S. B. DOUGHERTY
SAFETY VALVE.

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Patented Mar. 10, 1868.

Fig. 3.

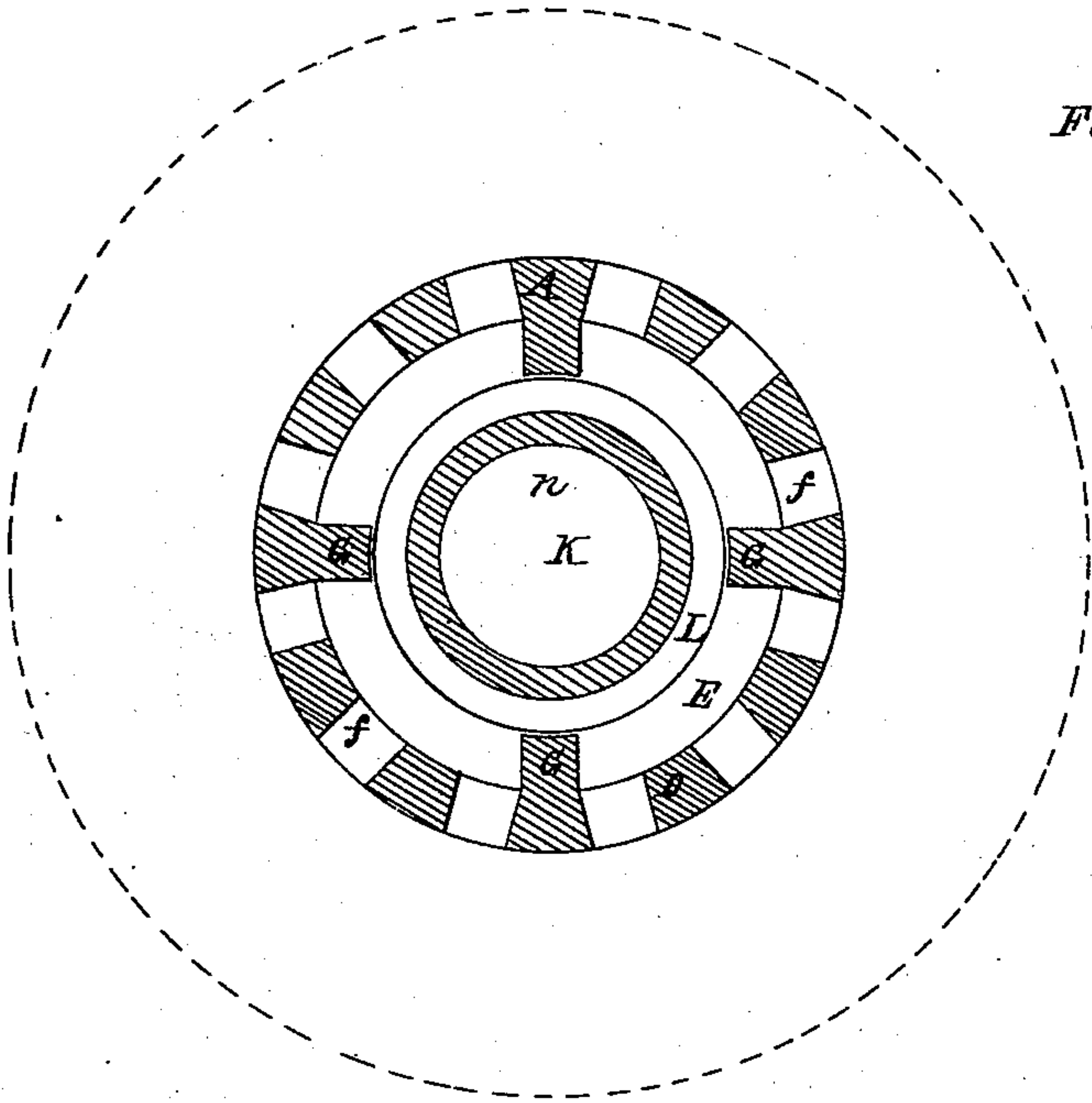
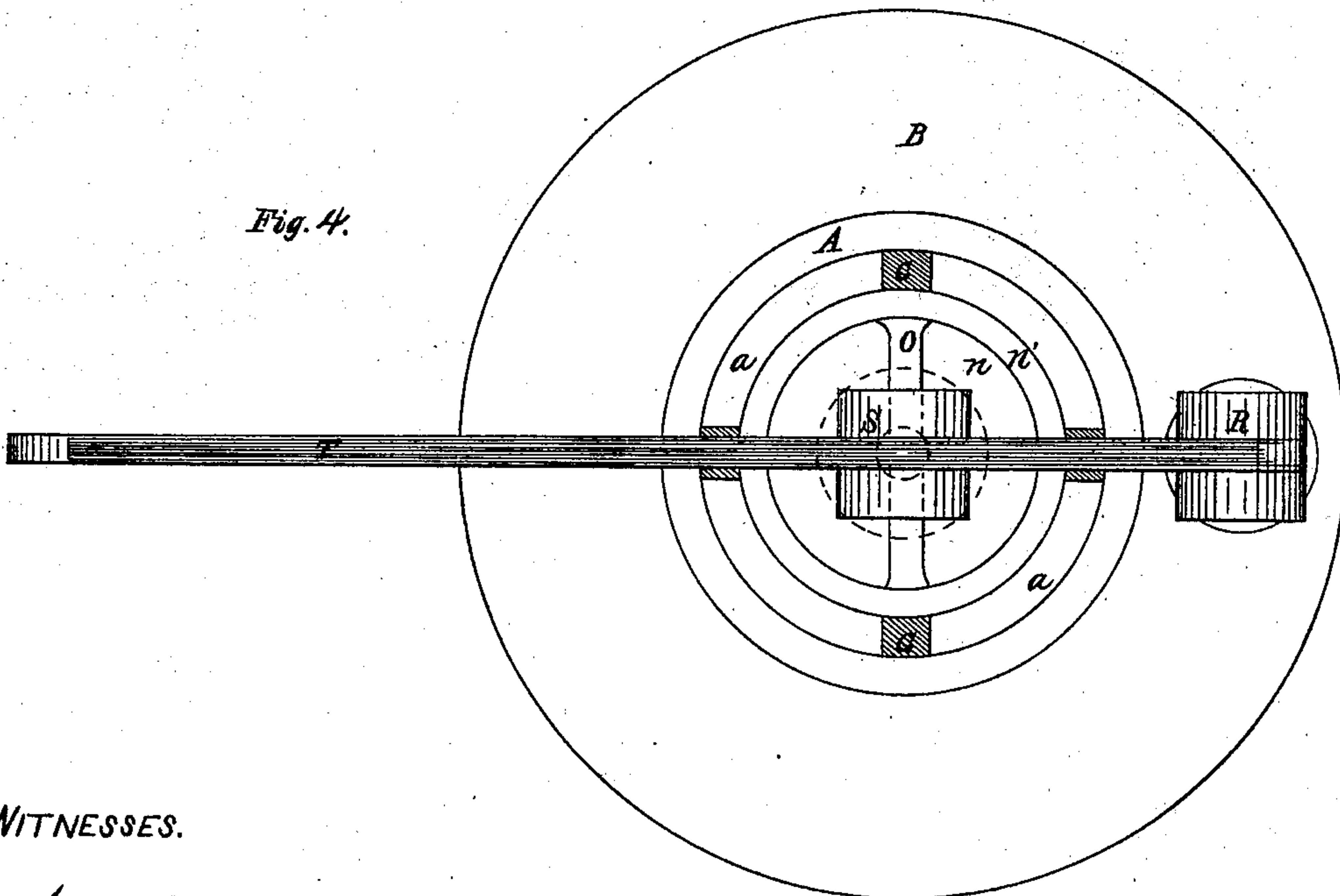


Fig. 4.



WITNESSES.

A. O'Kee
Louis Kolber

INVENTOR.

S. B. Dougherty

United States Patent Office.

S. B. DOUGHERTY, OF BORDENTOWN, NEW JERSEY, ASSIGNOR TO HIMSELF AND JOHN ASHCROFT, OF NEW YORK CITY.

Letters Patent No. 75,392, dated March 10, 1868.

IMPROVEMENT IN SAFETY-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, S. B. DOUGHERTY, of Bordentown, in the county of Burlington, and State of New Jersey, have invented a new and useful Improvement in Safety-Valves for the boilers of locomotives and other steam-engines; and do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, of which—

Figure 1 is an elevation of a safety-valve constructed in accordance with my invention.

Figure 2, a vertical section, representing the valve raised from its seats.

Figure 3, a horizontal section through the steam-entrance, and

Figure 4 a plan or top view of same.

The nature of my invention consists in the combination of two hollow cylinders, one within the other, and so placed, in relation to the dome or steam-space in a boiler, as to project downward into said space, in direct communication with the steam, the outer cylinder being attached to the dome or shell of the boiler, and having perforations, which admit the steam into an annular chamber between the cylinders, and having also seats and guides for reception of the inner cylinder, which slide within the same, constituting a double-seat valve, whereby, as the valve is raised from its seats, additional surface is exposed to the steam, which then has a free and easy exit from the boiler, thereby preventing accident from explosion.

Having described the nature of my invention, I will now describe its construction and operation.

In the drawings, A represents the outer or perforated cylinder, having a flange, B, for attaching the cylinder to the dome or boiler, C, of a steam-engine. D represents the perforated portion of the cylinder, which extends downward into the boiler for the purpose of admitting steam into the annular chamber E through the perforation *ff*. G G are projections in the annular chamber, which serve to guide the valve in its vertical movements, said chamber being enlarged at this point, *a*, (see fig. 2,) for affording an increase of room for the escape of steam when the valve is raised. H is an auxiliary chamber, and I I are the valve-seats in said outer cylinder. K is the double-seat valve, or inner hollow cylinder, the upper foot, *k*, of which projects beyond the lower foot, *k'*, (see fig. 2,) and having an annular recess, L, forming a shoulder at *m*, against which the steam presses, thereby aiding the steam to raise the valve from its seats. *n* is the large open space in the valve K through which the steam entering at the lower valve-seat makes its exit. The upper end, *n'*, of this valve is enlarged, (see fig. 2,) and has a transverse bar, O, sustaining a boss, *p*, for reception of the ordinary mechanism, which consists of a stand, R, fulcrum S, and weighted lever T, for holding the valve on its seats. The said mechanism (because of the above-described construction of a safety-valve) I am enabled to diminish in size and movement to one-eighth of that of the ordinary mechanism at present used for the purpose.

The operation of my invention is as follows: The combined cylinders A K being attached to the steam-boiler, as already explained, the steam enters through the perforations *ff*, filling the annular chambers E L, and pressing against the shoulder *m* of the valve. Now, as the force exerted by the steam on the valve exceeds the working-pressure, the valve K will be raised from its seats, and the surplus steam permitted to escape from the boiler through the circular space between the cylinders, as well as through the large open interior of the valve K, by means of which the pressure of the steam is immediately regulated, and accident from explosion prevented by means of my invention, which allows of nearly double the amount of steam to escape, as compared with the ordinary valve.

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

The arrangement of the cylinder A, with its perforations *ff*, annular chambers E *a* H, and valve-seats I I, substantially as described and set forth.

I also claim the construction of the inner cylinder or double-seat valve K, with its recess L, shoulder *m*, seats *k* and *k'*, and internal steam-exit opening *n n'*, substantially as set forth and described.

In testimony whereof, I have hereto set my signature, this 23d day of December, A. D. 1867.

S. B. DOUGHERTY.

Witnesses:

A. O'NEILL,

LOUIS KOLBER.