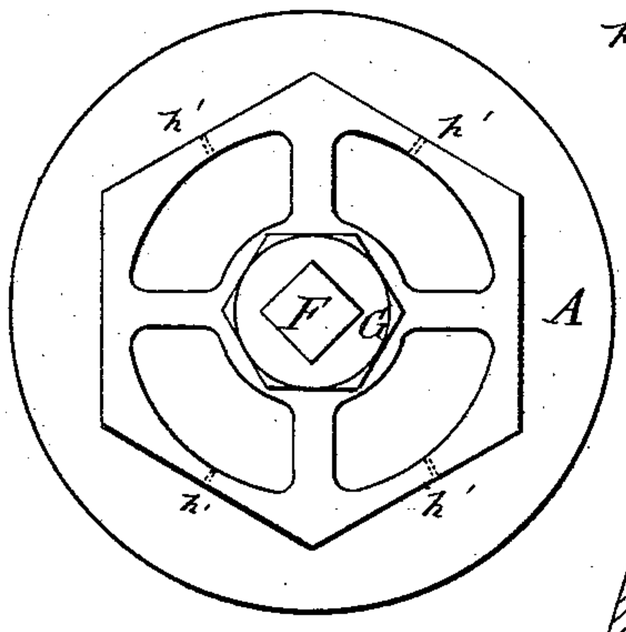
R. M. PRINGLE & W. D. ROBB.

Safety-Valve.

No. 217,745. Patented July 22, 1879.

Fig: 1.

Fig: 3.



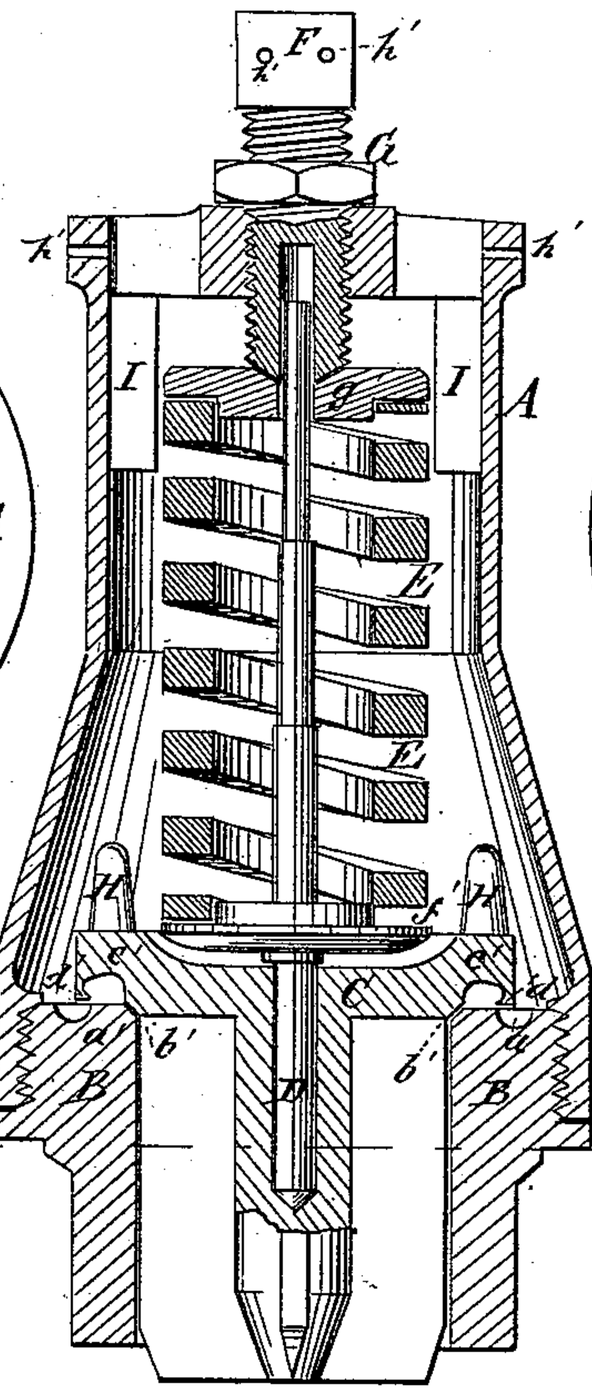


Fig: 2.

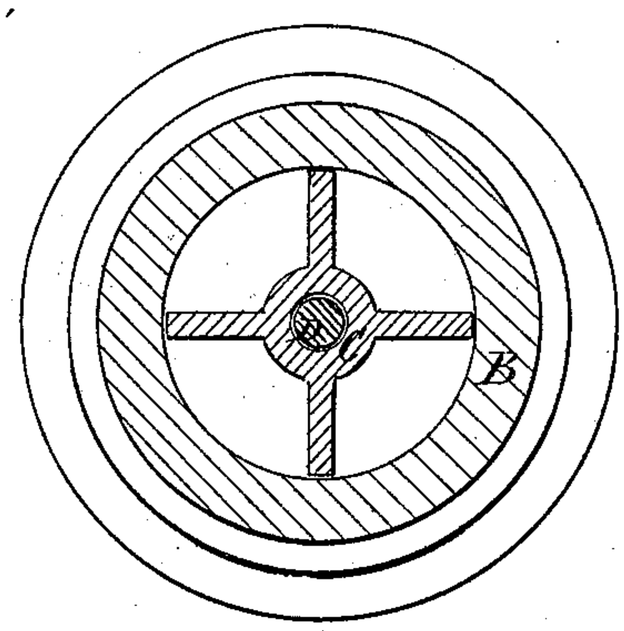
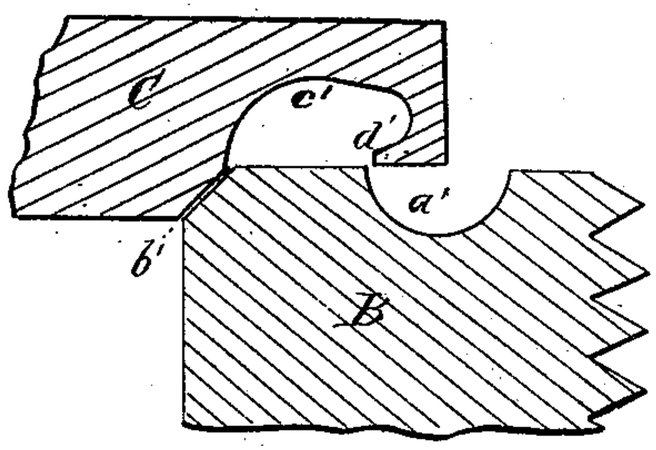


Fig: 4.



WITNESSES:

Chas. Nida.

C. Sedgwick

INVENTOR:

R. M. Pringle

W. D. Robb

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT M. PRINGLE AND WILLIAM D. ROBB, OF ELIZABETHTOWN, KY.

IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. **217,745**, dated July 22, 1879; application filed June 2, 1879.

To all whom it may concern:

Be it known that we, ROBERT M. PRINGLE and WILLIAM D. ROBB, of Elizabethtown, in the county of Hardin and State of Kentucky, have invented a new and Improved Safety-Valve, of which the following is a specification.

Figure 1 is a vertical sectional elevation of the valve. Fig. 2 is a cross-section on line *x x*, Fig. 1. Fig. 3 is a plan of the device. Fig. 4 is an enlarged sectional view of the groove in the overhang of the valve.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a more simple and effective pop-valve, for locomotive-engines and steam-boilers generally, than any of those now in use.

The invention consists in changing the form of valve in common use, so as to make it extremely sensitive to any variations in steam-pressure, and so that the escaping steam shall assist in closing as well as in opening the valve, and in inclosing it in a case provided with a set-screw and jam-nut, in order to adjust and secure the valve at will.

In the drawings, A represents the case, into the bottom of which is screwed the valve-seat B, that is provided with an annular groove, *a'*, of semicircular cross-section on its upper surface, and is beveled on the edge at *b'*, that forms the seat for the valve C, which has a corresponding bevel on its under side, as shown. The valve is also provided with an annular groove, *c'*, on its face; and our improvement consists, in part, in making this groove one-thirty-second of an inch, or thereabout, larger in diameter than the groove in the seat, and in enlarging the groove sidewise by cutting in toward the rim of the valve, so as to create an inwardly-curving lip, *d'*, extending around it.

The pin D, which is socketed in the valve, is provided with a fixed lower plate, *f'*, and a movable upper one, *g'*, held between which and encircling the pin is the spiral spring E, for holding the valve down against the pressure of steam.

Through the top of the case is entered the set-screw F, over the head of the pin and against the upper plate, so that by turning the set-screw the tension on the spring E is regulated, while the jam-nut G secures the set-screw, and hooks or wires passed through the holes *h' h'* in the head of the screw and the case prevent any tampering with the adjustment.

H H are lugs on the valve, for the convenience of grinding it to the valve-seat, and I I are guides for the spring.

When this device is attached to a boiler the steam under pressure lifts the valve against the power of the spring, and at the same time entering the undercut groove of the valve tends in escaping from it to draw the valve down again to its seat, and thus the valve is kept vibrating up and down, as it were, on a cushion of steam, which renders it extremely sensitive to any change of pressure within the boiler, and prevents it from being violently seated by the action of the spring when the excess of steam has escaped, and prevents it also from sticking to its seat and "hanging fire" in the manner common to all other pop-valves with which we are acquainted.

On an engine standing still and with a heavy fire, this valve will open and close every few seconds, sometimes merely making a puff of steam, so readily does it yield to any pressure in excess of that for which it is adjusted.

We are aware that pop-valves have been constructed with corresponding annular grooves both in valve and valve-seat, hence do not broadly claim them; but,

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

1. The within-described valve, consisting of case A, provided with holes *h' h'*, valve-seat B, provided with an annular groove, *a'*, valve C, provided with an undercut annular groove, *c'*, and inwardly-curving lip *d'*, pin D, provided with plates *f'* and *g'*, spiral spring E, set-screw F, provided with holes *h' h'*, and jam-nut G, constructed substantially as and for the purpose described.

2. The valve C, provided with an undercut groove, *c'*, which forms an inwardly-curving lip, *d'*, substantially as herein shown and described.

ROBERT MARION PRINGLE.
WILLIAM DONALDSON ROBB.

Witnesses:
JAMES C. POSTON,
LUKE C. HAYS.