# W. B. MACK.

## STEAM SAFETY-VALVE.

No. 191,871. Patented June 12, 1877.

Fig. 1.

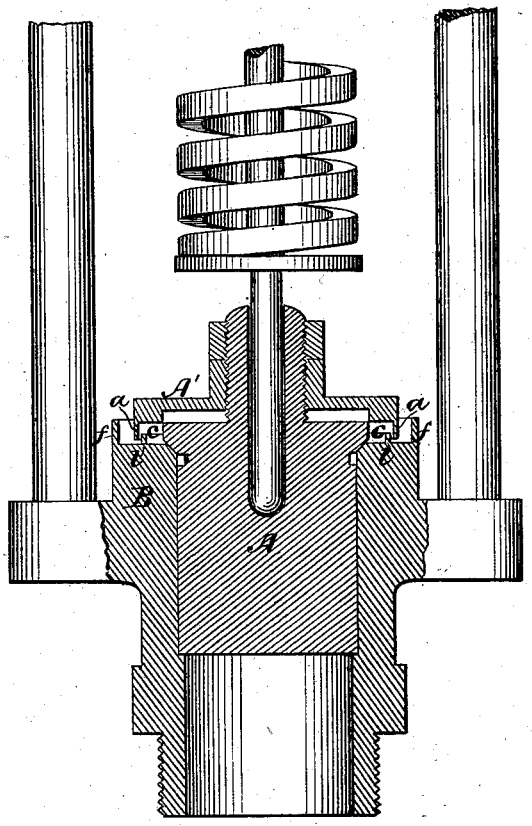



Fig. 2.

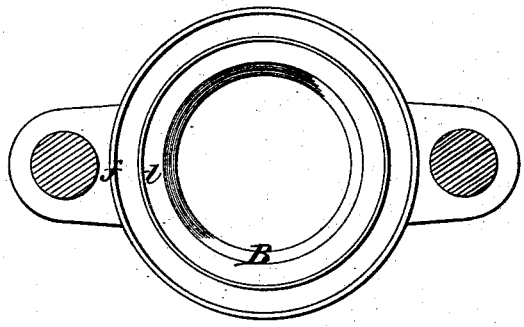
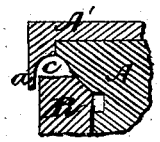



Fig. 3.




Witnesses.
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# UNITED STATES PATENT OFFICE.

WILLIAM B. MACK, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN STEAM SAFETY-VALVES.

Specification forming part of Letters Patent No. **191,871**, dated June 12, 1877; application filed February 17, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM B. MACK, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Steam Safety-Valves, of which the following is a specification:

In the accompanying drawing, forming a part of this specification, Figure 1 represents a transverse vertical central section of a valve embodying my improvement. Fig. 2 represents a top view of the valve-seat, the valve being removed; and Fig. 3 represents a sectional view of an old form of valve-seat.

This invention relates to that class of steam safety-valves in which a surface is formed on the valve outside of the "ground-joint" for the escaping steam to act against, and thereby assist in holding the valve open; and it relates more particularly to valves of the above-named class in which this surface is formed in an adjustable lipped flange, as in the patent of Patrick Mooney, August 25, 1874, No. 154,509.

The object of my invention is to improve the construction of the valve-seat of a valve of the above-named class in such manner that the operation of the valve shall be more efficient and satisfactory, and that the escape of steam shall be attended with less noise than heretofore. To these ends my invention consists in providing the valve-seat outside of the ground-joint with an annular upwardly-projecting lip or flange of less diameter than the downwardly-projecting lip or flange of the valve, and of such height as to project above the plane of the lower edge of the said lip or flange when the latter is closed, as I will now proceed to describe.

In the drawings, A represents the valve, having the adjustable portion A′, which is provided with a downwardly-projecting lip or flange, *a*, as in the patent of Mooney above referred to, the valve being otherwise of the usual construction. B represents the valve-seat, which is provided with an upwardly-projecting marginal rim or flange, *f*, and an inner upwardly-projecting lip or flange, *l*, which is located between the ground-joint of the valve-seat and the rim *f*. The lip *l* is of less diameter than the lip *a* of the valve, and is of such height and diameter that when the valve is closed the upper edge of the lip *l* will project above the plane of the lower edge of the lip *a*, and a narrow annular space will exist between the inner surface of the lip *a* and the outer surface of the lip *l*, the adjacent sides of the lips *a l* being vertical, and therefore parallel. The rim *f* is considerably higher than the lip *l*, as shown in Fig. 1.

The surfaces of the valve-seat on each side of the lip *l* are preferably flat and in the same plane, and the under surface of the adjustable flange A′ is also flat. By this construction an annular chamber or space, *c*, is formed, which is bounded partly on one side by the lip *l*, the latter constituting a barrier or cushion, over which the escaping steam must pass. The close proximity of the lip *l* to the lip *a* of the valve renders it impossible for the steam to escape rapidly until the lower edge of the lip *a* is raised above the plane of the upper edge of the lip *l*. Hence it will be seen that when the valve is opened the escaping steam, being confined in the space *c*, will readily raise the valve until an opening is created between the lips *a l* equal in area to the opening between the ground-joints of the valve and seat. It will also be seen that the adjustability of the lip *a*, in connection with the lip *l*, enables the valve to be easily regulated as to the degree of pressure required to lift it to its utmost extent.

It has been usual heretofore to provide the outer portion of the valve seat with an annular groove or depression adapted to receive the lip of the valve, or to make the valve-seat of such diameter that the lip *a* of the valve will entirely inclose the upper edge of the seat, as shown in Fig. 3. This construction necessitates the forming of a deeper groove or annular recess in the valve to make the space *c* than in my construction, and this deep groove or recess causes the escaping steam to make a louder and more disagreeable noise than when the space *c* is bounded partially by the lip *l*, as I have found by actual test.

I claim as my invention—

1. A safety-valve provided with an adjustable lip, the diameter of which is greater than the diameter of a projecting lip on the valve-seat, which forms a wall to the plane adjacent

to the valve, in combination with said plane and lip, substantially as and for the purpose described.

2. A valve-seat having a plane extending from the point of escape of steam, and provided with a projecting lip to direct the steam upward, and an intermediate lip, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM B. MACK.

Witnesses:
CARROLL D. WRIGHT,
PETER W. FRENCH.