(No Model.)

C. & A. H. JARECKI.

POP SAFETY VALVE.

No. 281,369. Patented July 17, 1883.

Fig 1.

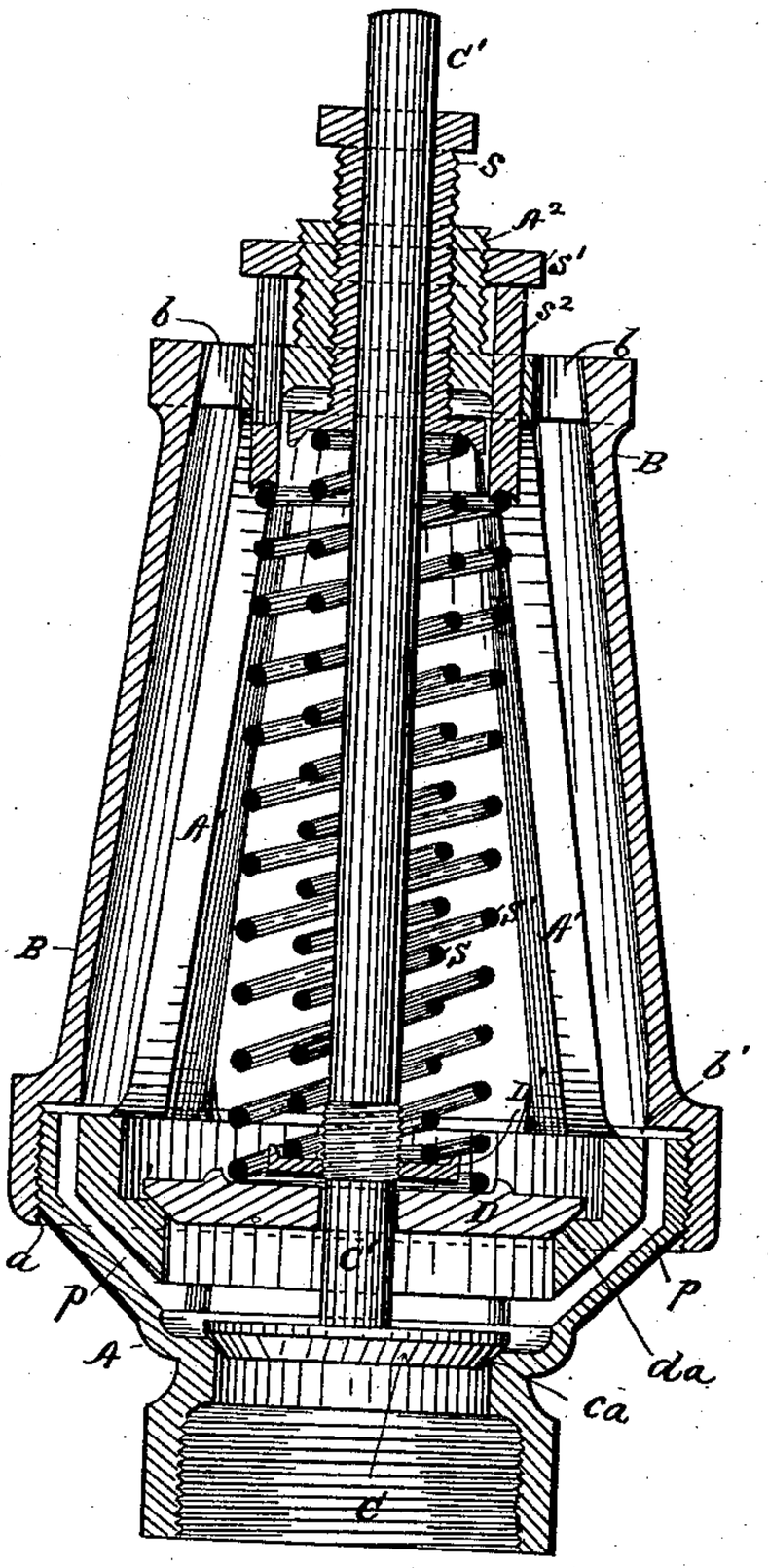


Fig 2.

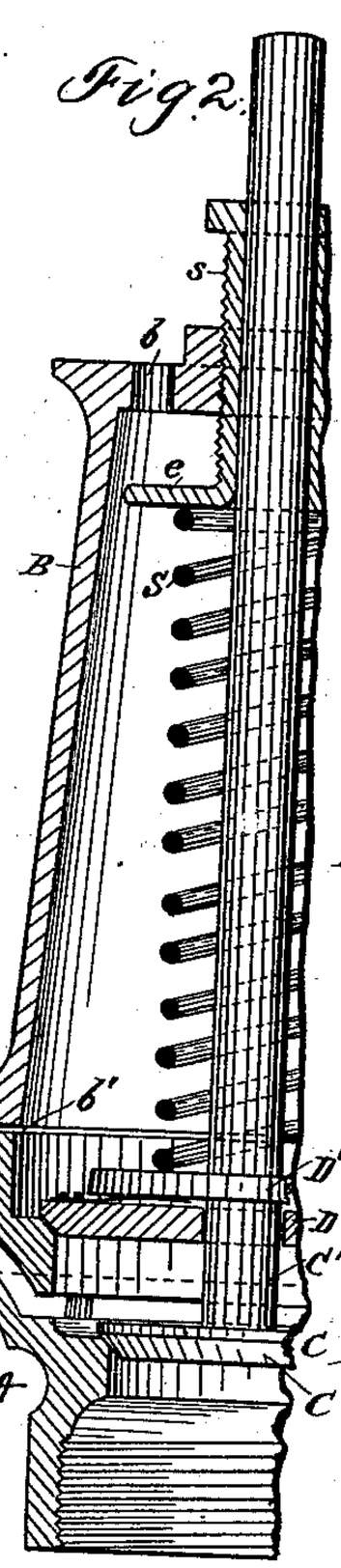
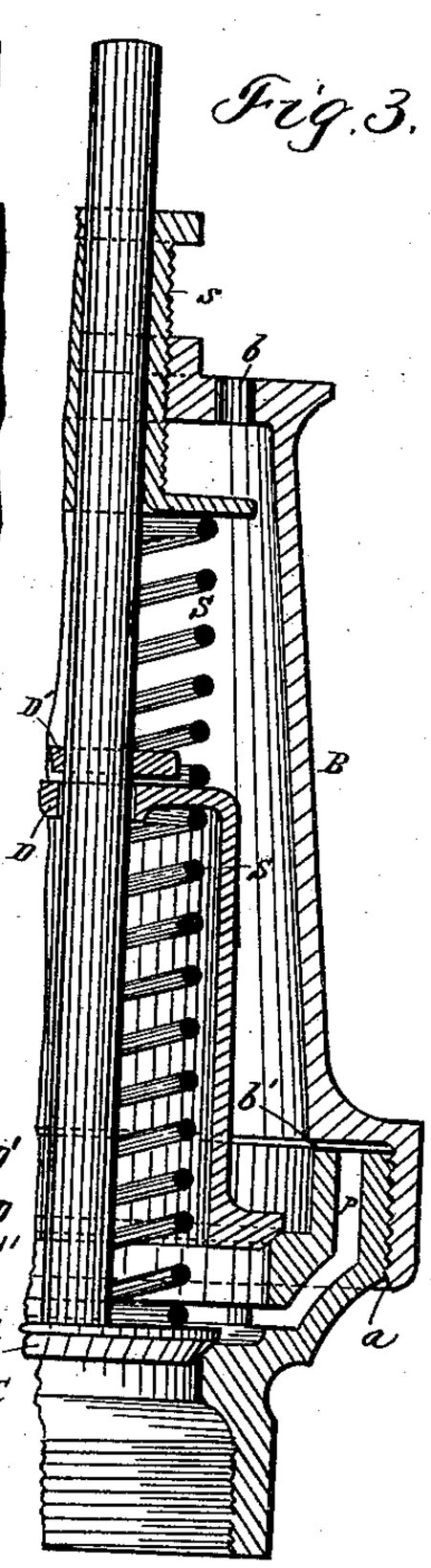


Fig 3.



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UNITED STATES PATENT OFFICE.

CHARLES JARECKI AND ALBERT H. JARECKI, OF ERIE, PENNSYLVANIA.

POP SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 281,369, dated July 17, 1883.

Application filed March 27, 1883. (No model.)

To all whom it may concern:

Be it known that we, CHARLES JARECKI and ALBERT H. JARECKI, citizens of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Pop Safety-Valves; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to what are known as "pop safety-valves;" and it consists in certain new and useful improvements in the construction of the same, as will fully appear herein.

In the accompanying drawings there are three alternative constructions shown. These modifications are substantially or practically the same in effect, and in construction they differ, chiefly, in the disposition of parts and in the omission of parts. Each of the three figures are vertical longitudinal sections of one of our valves.

A A′ is the shell of the valve, of which A is the base or body, and A′ the cage. B is the case or jacket which surrounds the cage. C and D are the valves proper. *p p* are escape-ports. C′ is the valve-stem. D′ is the spring-support on the valve-stem. S and S′ are the springs by which the valves are weighted. *s* and *s′* are the nuts by which the tension of the springs is regulated. *c a* and *d a* are the seats of the valves C and D; and *b′* is a shoulder on the inside of the case B, which lies over the mouth of the ports *p p* and closes them more or less as the case B is adjusted on the screw *a* on the outside of the shell A.

In the construction shown in Figures 2 and 3 the cage A′ is omitted, and the case B is made to perform its functions. In the constructions shown in Figs. 1 and 3 a separate spring is used for each of the valves, while in Fig. 2 one spring serves for both. In Fig. 1 the two springs are arranged concentrically, while in Fig. 3 they are placed one above the other, the valve D being extended up to permit such an arrangement. In this latter construction both springs act upon the valve C, while only one, S′, acts on the valve D. Such other variations as exist in these figures are minor, and need not be referred to. These several constructions all work on the same principle, which is as follows: The steam first lifts the lower and smaller valve, C, and then comes in contact with the upper and larger valve, D, and lifts it. The larger valve, D, when lifted, holds up the lower valve, C. The area of the valve D being greater than the valve C, it will be maintained up with less pressure than was required to lift the smaller valve. Thus the two valves, taken as one, form a differential valve; but this differentiality can be greatly modified or entirely overcome, if wanted, by the use of two springs, one on each, and giving the springs differential tension. So it will be seen that the degree of differentiality can be regulated by adjustment. The object of all this is to properly regulate the amount of blow-off, or the pressure at which the blow-off shall stop, as well as the maximum pressure, or pressure at which the valve shall open.

We are aware that differential valves have been used in safety-valves, and shall make no claim to them, as such, our invention consisting in the peculiar construction of our valve and the manner of adjusting or regulating the same.

The construction and operation of our device are as follows:

The base of the shell A is provided with two valve-seats, *a c* and *a d*, and between these seats are the ports *p p*, which pass up into the case B. The amount of opening or discharge-space of these ports is adjusted by the proximity of the shoulder *b′* on the case B, and this is regulated by screwing the case more or less down on the screw *a* on the outside of the shell.

The valve C is solid on the stem C′, and the valve D is loose on it, but it can only move slightly off its seat without coming in contact with the fixed disk or arms D′ on the stem C′. The disk D′ is made with a screw, so it can be adjusted more or less near the valve D. The valve C is weighted by the spring S, which seats on the disk D′, and is adjusted as to tension by the nut *s*. The valve D is weighted by the spring S′, which seats on it, and is adjusted as to tension by the nut *s′*, which, in Fig. 1, acts upon followers s^2, which pass through holes in the top of the cage A′. The valve C will be adjusted to lift when the maximum pressure is reached, or, say, within a pound or so, of the maximum pressure. When

this valve lifts, steam will pass out through the ports *p p* into the case B, and out through the openings *b*. If the pressure should increase, the valve D will be lifted up against the disk D′ and afford still more opening for its escape. If the pressure should become or be still greater, the valve D will be lifted against the weight of both the springs S and S′, and both valves C and D will be carried farther from their seats, and a free blow-off will be afforded. The small valve C cannot close until the pressure on the united area of the valves is less than the united springs S S′.

In the construction shown in Fig. 2 there is only one spring used. This device will be simpler and easier to adjust, although as delicate results may possibly not be obtainable, but sufficiently so for all practical purposes. In Fig. 3 two springs are used, one above the other, and both adjusted by one nut. This may be less complicated as to adjustment than the construction shown in Fig. 1. Both springs in Fig. 1 may be adjusted by one nut, if desired, by making the flange on the lower end of the nut *s* wide enough to seat on both springs, and omitting the nut *s′* and followers s^2. Such a construction would greatly simplify the adjustment of the springs. While it has been said that in Fig. 2 only one spring is used, there is, in fact, two, for a leaf-spring is shown used between the disk D′ and the valve D. Some form of spring is necessary to keep the valve D seated, if any space is left between the disk D′ and the valve D.

What is claimed as new is—

1. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two valve-seats lying in different planes, two valves adjusted upon one stem, the access of steam to one being past the other, and a spring or springs for weighting said valves.

2. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two valve-seats of unequal diameters lying in different planes, two valves of unequal diameter adjusted upon one stem, the access of steam to one being past the other, and a spring or springs for weighting said valves.

3. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two concentric valve-seats of unequal diameter lying in different planes, the one of lesser diameter being below the other, two valves of unequal diameter adjusted upon one stem, the one of lesser diameter being below the other, the access of steam to one being past the other, and a spring or springs for weighting said valves.

4. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two valve-seats lying in different planes, two valves adjusted upon one stem, and to move independently from their seats, and springs for weighting said valves.

5. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two valve-seats of unequal diameter lying in different planes, two valves of unequal diameter adjusted upon one stem, and to move independently from their seats, and springs for weighting said valves.

6. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two concentric valve-seats lying in different planes, escape-ports leading from the space between said valve-seats, two valves adjusted upon one stem, and to move independently from their seats, and springs for weighting said valves.

7. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two concentric valve-seats of unequal diameter lying in different planes, escape-ports leading from the space between said seats, two valves of unequal diameter adjusted upon one stem, and to move independently from their seats, and springs for weighting said valves.

8. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two concentric valve-seats lying in different planes, the one of lesser diameter being below the other, escape-ports leading from the space between said valve-seats, two valves of unequal diameter adjusted in different planes on one stem, and to move independently from their seats, the valve of the lesser diameter being below the other, and springs for weighting said valves.

9. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two concentric valve-seats lying in different planes, escape-ports leading from the space between said valve-seats, an annular part screwing upon said shell and overlapping the mouths of said ports, two valves adjusted upon one stem, and, finally, a spring or springs for weighting said valves.

10. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two valve-seats lying in different planes, escape-ports leading from the space between said valve-seats, and a case or jacket screwing upon said shell and overlapping the mouths of said ports, and adapted, as shown, to receive the escaped steam from said ports and discharge it at a point above into the open air.

11. In a safety-valve, the combination, substantially as shown, of the following elements: a shell or body having two valve-seats lying in different planes, a case or jacket supported upon said shell, and adapted, as shown, at its upper end to receive a spring seating and adjusting screw, two valves adjusted upon one stem, and a spring or springs for weighting said valves, which seat at the top upon the said spring seating and adjusting screw.

12. In a steam safety-valve, a differential valve formed of two disk-valves, which are adapted, as shown, to lift from their seats in-

dependently, the access of steam to one being past the other, as shown.

13. In a steam safety-valve, the combination, with a differential valve, which is formed of two disk-valves, which are adapted, as shown, to lift from their seats independently in succession, of a shell having escape-ports leading from the space between said valves, whereby one valve may lift and exhaust the steam at a point below the other valve, as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES JARECKI.
ALBERT H. JARECKI.

Witnesses:
JNO. K. HALLOCK,
ROBT. H. PORTER.