No. 656,236. Patented Aug. 21, 1900.

E. A. & W. E. WOOD.

SAFETY VALVE.

(Application filed Nov. 7, 1899.)

(No Model.)

Fig. 1.

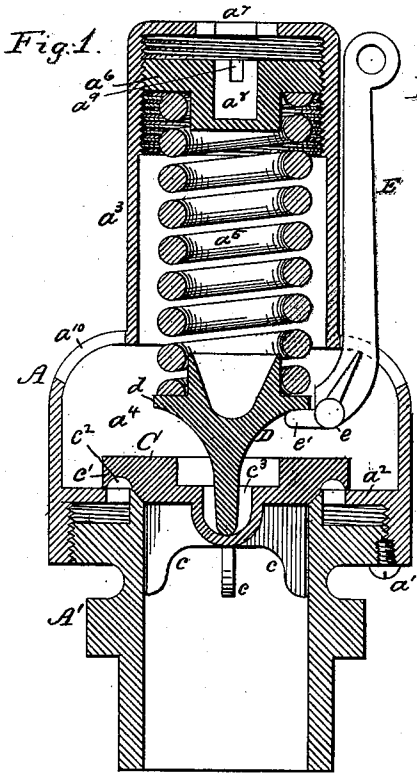


Fig. 3.

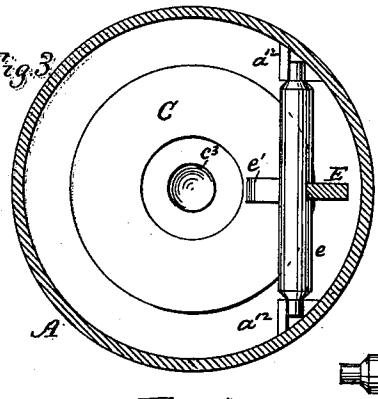


Fig. 5.

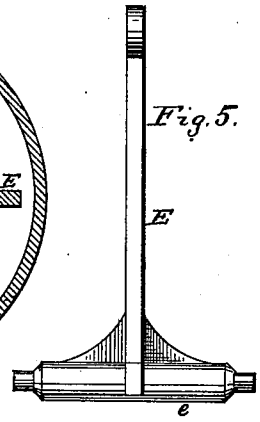


Fig. 4.

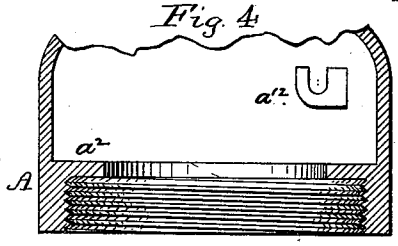


Fig. 6.

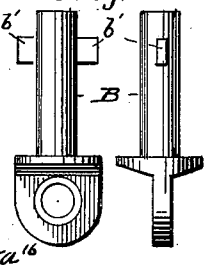


Fig. 2.

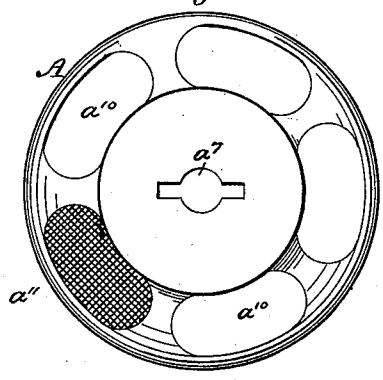
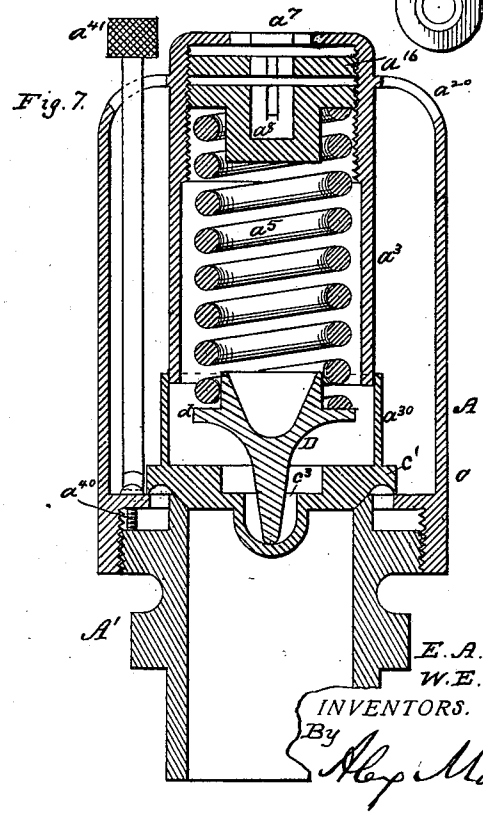


Fig. 7.



WITNESSES

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SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 656,236, dated August 21, 1900.

Application filed November 7, 1899. Serial No. 736,163. (No model.)

To all whom it may concern:

Be it known that we, EDWIN A. WOOD and WILLIAM E. WOOD, citizens of the United States, residing at Utica, in the county of Oneida, State of New York, have invented an Improvement in Safety-Valves, of which the following is a specification.

This invention relates to that type of safety-valves commonly known as "pop-valves," in which the valve is held to its seat by spring-pressure; and it comprehends means for adjusting the tension of the spring to adapt the valve to different pressures and in means for opening the valve by hand for the purpose of blowing off.

Specifically, it consists in a valve-casing provided with a chamber in which the spring is located, said chamber being internally threaded and having therein an adjusting-screw forming a seat for one end of the spring, by the adjustment of which screw the tension of the spring may be varied at will.

It consists also in the means hereinafter described for adjusting said screw.

It consists, further, in the novel construction and application of a lever for compressing the spring to take the pressure thereof from the valve to permit the latter to open freely.

In the accompanying drawings, which illustrate our invention, Figure 1 shows a longitudinal section through the valve-casing. Fig. 2 is a plan view; Fig. 3, a horizontal section through the casing on the line x x in Fig. 1. Fig. 4 is a sectional elevation of a portion of the casing. Fig. 5 is a front view of the lever. Fig. 6 represents the key for adjusting the tension of the spring. Fig. 7 is a longitudinal section through a modified form of valve-casing, showing also modifications in some of the details.

Referring first to Figs. 1 to 6, A A′ designate the valve-casing made in two parts, the part A screwing down over the part A′, as shown in Fig. 1. The two parts when screwed together are securely fastened and prevented from unscrewing by a small screw a', tapped into the joint from below. The part A is formed with an interior annular flange a^2, which we denominate the "blow-down" ring and which surrounds the mouth of the lower member A′, with an open space for the passage of steam between the two. The upper part A of the casing is also formed with a tubular cylindrical extension a^3, which rises from and is in open communication with the expansion and valve chamber a^4. This extension forms a chamber for the coiled spring a^5, which holds the valve to its seat. The upper end of said chamber is interiorly screw-threaded, and in said threaded portion is a screw plug or washer a^6, which forms a seat for the spring and which is adjustable up and down for the purpose of varying the tension of the spring, the adjustment being effected by means of a key B, (shown in Fig. 6,) which is inserted in an opening a^7, formed through the top of the chamber a^3. Said key may be a plain prismatic rod or bolt, the plug or washer being formed with a correspondingly-shaped socket in its upper face for the reception of the end of the key; but in the preferred construction shown the key consists of a plain cylindrical shank or stem with laterally-extending arms or bits b' near the end thereof, the plug being formed with a central socket a^8 and with lateral slots or notches a^9, extending therefrom for the reception of the key-bits b'. By inserting the key through the opening a^7 and into the socket and notches a^8 a^9 in the plug or washer a^6 the latter may be turned and screwed either up or down to adjust the tension of the spring, as may be desired. The adjustment having been made, the key may be removed to prevent tampering with the valve.

In order to secure the plug or washer a^6 in its adjusted position to prevent movement thereof, a screw-disk a^{16} is located above the same, which disk is provided with a keyhole a^{17} of the same shape as the opening a^7. The key is inserted through the openings a^7 and a^{17} into the socket and notches a^8 a^9, and the plug a^6 adjusted, as already explained, after which the key is partially withdrawn until the bits b' thereof are in the opening a^{17}. Then by turning in the proper direction the disk a^{16} is screwed down upon the washer after the manner of a jam-nut.

C designates the valve seated on the upper end of the casing member A′ and formed on the under side with the usual guiding-wings c, which fit loosely in the throat of the casing to guide the valve in its opening and closing

movements. The valve is formed with a lateral flange c, which extends out to the blow-down ring or slightly overlaps the same, and has in its under surface an annular groove c^2 to hold the stem and give greater lifting force.

In the upper face of the valve is formed a socket c^3, in which is stepped a post D, on the upper end of which is formed a flange d, which serves as a seat for the lower end of the coiled spring a^5 and between which seat and the plug or washer a^6 the spring is compressed to any extent by adjusting the plug in the manner above described.

In the member A of the casing in the top of the valve-chamber, around the base of the extension a^3, are formed a series of openings a^{10} for the escape of the steam from the valve and expansion-chamber when steam is blowing off. These openings may be covered with fine wire-gauze, as shown at a^{11}, to divide the escaping steam and so increase the muffling effect.

E designates a lever mounted on a short transverse shaft e, which is journaled in bearings a^{12} within the valve-chamber, as shown in Figs. 3 and 4. Projecting inwardly from the shaft e at substantially right angles with the lever is a short arm e', which underlies the flange d of the post D, so that by operating the lever, which projects through one of the openings a^{10} and stands at the side of the extension a^3, the said post may be raised to relieve the valve from the pressure of the spring, when the valve will be free to open.

In the modification shown in Fig. 7 the upper member A^2 of the casing is of uniform size and is connected at the top with the spring-chamber a^3, the latter depending within the outer or main casing to within a short distance of the valve. The casing A^2 forms an expansion-chamber around the spring-chamber a^3 to permit the expansion of the steam before it escapes through the openings a^{20} at the top. The valve has on its upper face a tubular extension a^{30}, which telescopes with the chamber a^3, to prevent the accumulation of steam-pressure above the valve. It also forms an additional guide to prevent the valve from tilting. This extension may be slotted at one side for the accommodation of the lever E, which when used is mounted and operates in the manner above described. The lever is omitted in the view for the sake of simplicity, but when used it is mounted and operates in the manner shown and described with reference to Fig. 1. In this construction the upper member A^2 and the lower member A′ are locked together by a screw a^{40}, inserted from the top through the blow-down ring a^2. The screw is inserted through one of the openings in the top of the casing and may be operated by a long screw-driver, or it may be formed with a long shank, which extends through the top of the casing, being provided with a milled head a^{41}, by which it is conveniently turned. The screw is threaded in the blow-down ring and its point bears on the shoulder of the lower member A′, which is preferably, but not necessarily, formed with a circular row of depressions for the point of the screw. By slightly withdrawing the screw the member A may be rotated until the valve closes at the desired pressure, after which the screw is again tightly set down and the parts secured in the adjusted position.

Clearly both of the screws a' and a^{40} may be applied to the same structure, and although not so shown we desire to have it understood that such application falls within the scope of our invention.

What we claim as our invention is—

1. The combination with the casing, the valve and its spring, of a screw-washer in the casing, said washer having a key-opening formed therein, and the casing having a hole conforming to the key for the insertion of a removable key for adjusting the washer to regulate the tension of the spring.

2. The combination with the interiorly-threaded valve-casing, the valve, the spring, and the plug or washer for adjusting the tension of the spring, of a threaded locking-disk located in the casing above the plug and adapted to be screwed down upon the same, and a separable key adapted to engage said plug and said disk separately to effect adjustment thereof.

3. In a safety-valve, the combination with the valve-casing made in two parts screwed together, one part having an interior annular flange and the other part or shoulder overlapped by said flange, and a set-screw extending through said flange and adapted to engage the shoulder.

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

EDWIN A. WOOD.
WILLIAM E. WOOD.

Witnesses:
W. H. GLATT,
S. A. GIBBINS.