

G. W. KELLER.
 SAFETY VALVE.
 APPLICATION FILED FEB. 8, 1913.

1,071,431.

Patented Aug. 26, 1913.

Fig. 2.

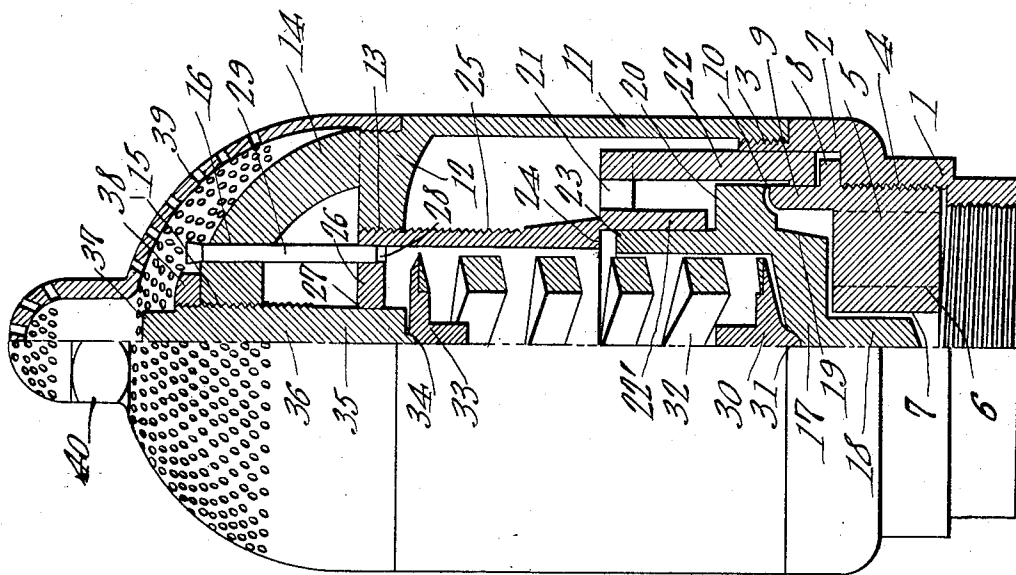
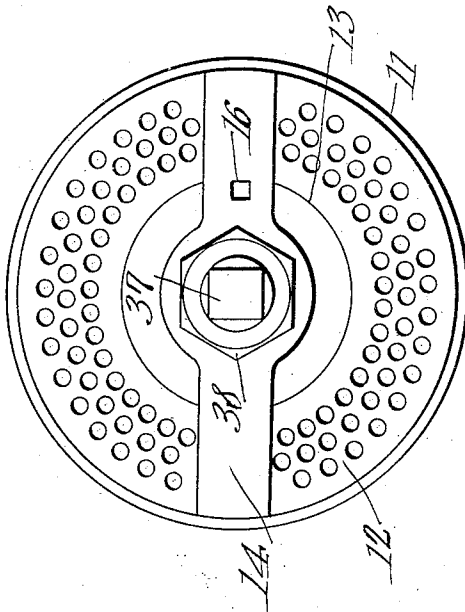


Fig. 1.

Witnesses
J. J. Jones
S. Willard

G. W. Keller,
 Inventor
 by *C. A. Snow & Co.*
 Attorneys

UNITED STATES PATENT OFFICE.

GEORGE WILLIAM KELLER, OF ROANOKE, VIRGINIA.

SAFETY-VALVE.

1,071,431.

Specification of Letters Patent.

Patented Aug. 26, 1913.

Application filed February 8, 1913. Serial No. 747,190.

To all whom it may concern:

Be it known that I, GEORGE W. KELLER, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, have invented a new and useful Safety-Valve, of which the following is a specification.

The present invention relates to improvements in safety valves, and relates more especially to that form of valve known as "pop valves," the primary object of the present invention being the provision of a valve, in which the wearing parts are made detachable and removable, there being provided a false valve seat in the base of the same, whereby the same may be removed when too greatly worn and a new one substituted, thus permitting the employment of the base, without discarding the same as is the usual practice.

A further object of the present invention is the provision of a safety valve of this character in which the escaping pressure fluid therefrom is directed through the upper portion and out of the dome, where a dome is employed or directly through the upper end where the dome is discarded, thus directing the pressure fluid away from the engine, so that the vision of the engine man, when the same is connected to a steam locomotive, is not obscured.

A still further object of the present invention is the provision of a safety valve, in which the valve parts are so disposed, as to be prevented from clattering due to the automatic opening or "popping" of the valve, so that the wear upon the working parts is reduced, and the objectionable noise caused in many forms of valves is dispensed with, thus producing a muffled and practically noiseless valve.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings Figure 1 is a view partly in elevation and partly in vertical section, showing the parts of the valve in their normal closed position. Fig. 2 is a top plan view of the valve with the dome removed.

Referring to the drawings, the numeral 1 designates the base of the valve, which is provided with the upstanding and annular projection or rim 2, which is exteriorly threaded, as at 3, and interiorly threaded in the intermediate diametered portion 4, for the reception of the false valve seat 5, said valve seat 5, as clearly shown, being provided with a plurality of spiders 6, terminating in the central valve stem guiding port or aperture 7.

The valve seat 5 is provided with the annular shoulder 6 which is disposed to fit within the shouldered portion formed in the upper enlarged diametered portion of the base adjacent the projecting rim 2 and with the upstanding valve seat carrying rim 9, the valve seat 10 being formed upon the upper edge thereof, as clearly illustrated.

A supporting casing 11 for the mechanism, is threaded and secured upon the threaded portion 3 of the base 1. The casing 11 is provided with the inwardly projecting annular member 12, which is threaded as at 13, having projecting above the same and extending diametrically thereacross, the yoke 14, provided with the interiorly threaded concentric aperture 15, and with the locking pin receiving aperture 16, the purpose of which will presently appear.

Disposed for vertical sliding movement within the false valve seat and having a portion projecting thereabove, is the lower valve 17, whose guiding stem 18 is disposed for vertical sliding movement in the valve stem guiding bore 7 of the false valve seat 5. The valve 7 is so constructed as to have the reduced portion 19, which with the rim 9 of the seat 5 provides a space for the passage of the pressure fluid upwardly through the valve for the necessary escape. The valve 17 is further provided with the annular rim 20 which is disposed to coact with the valve seat 10 of the rim 9, and thus normally prevent the upward passage of the pressure fluid.

In order to provide a means for retaining the valve 17 properly positioned and to limit the upward movement thereof, the rim 20 is disposed to fit within the rim 2 of the base 1 and the rim 3 of the seat 5, and project above the upper end 23 of the valve 17, said rim 22 having formed integral therewith the perforated disk 21, and the downwardly projecting inner flange 22', which, as before stated, provides a receptacle for the upper reduced

rim 22 of the valve 17, the rim 22 forming a guiding means for the rim 23 of the valve while the shoulder 24 limits the upward movement of the valve. This valve 17 is in reality a socketed member, and receives the disk 30, which is connected by means of a ball and socket joint 31, concentrically of the valve 17, so that the disk 30 may have a slight gyratory movement due to the rapid vibrations of the valve 17 during the escape of the pressure fluid, the spring 32 being disposed within the threaded stem portion 25 of the valve holding and limiting member and being held adjustably tensioned down upon the disk 30 through the medium of the disk 33, said disk 33 being provided with the ball and socket joint 34 in connection with the adjusting and holding stem 35 disposed above and concentrically of the valve 17.

The upper end of the tubular portion 25 is sealed as at 26, and is provided with a smooth bore 27 through which the smooth cylindrical portion of the stem 35 fits, the threaded end 36 of said stem being adjustably mounted in the threaded aperture 15 of the yoke 14, and being held in the desired adjusted position by means of the lock nut 38, the upper end of the stem being shouldered, as at 37, for the reception of a wrench or other tool for rotating the stem to adjust the tension of the spring 32. The sealed portion 26 of the member 25 is provided with an aperture 28, which is disposed to aline with the aperture 16 of the yoke 14, to receive a locking pin 29, which maintains the casing 11 and the member 25 in fixed relation to each other.

Removably fitted upon the upper end of the casing 11, is a dome 39, which is perforated as indicated, and is provided with the shouldered reduced end 40, whereby the same may be removed to permit of access to the parts, and for also adjusting the stem 35 to regulate the tension of the spring 32 upon the valve 17.

From the foregoing description, taken in connection with the drawings, it is evident that by mounting the valve 17 and the false valve seat 5 as herein shown, that the base 1 may be used many times as there is practically no wear thereupon, the valve seat 5 being detachably connected thereto, to permit of the easy removal of the same from the base after the detachment of the casing 11 therefrom. This feature is of the utmost importance in a valve of this character, as the action of the steam or pressure fluid upon the parts, tends to wear away the valve 17 and seat 5, and where the seat 5 is formed integral with the base, it has been found that after several grindings that the base is useless and therefore the main part of the valve is thrown away.

By providing the valve guiding member

with the perforated portion 21, and the casing 11 with the perforated portion 12, the released steam elevating the valve, passes about the sleeve 25 and does not affect the spring to any great extent, the same being placed out of the direct passage of the steam, while with the dome 39 perforated as indicated, the streams of the steam are directed upwardly instead of outwardly as in the usual practice, so that the objectionable feature of obscuring the vision of the engine-man where the device is used upon a steam locomotive, is overcome.

What is claimed is:

1. A safety valve, including a base having a plurality of different diametered portions, a valve seat removably mounted within the intermediate diametered portion, a valve mounted for movement upon the seat, a valve guiding member disposed above the valve within the enlarged diametered portion of the base, a casing surrounding the valve and guiding member, said casing adjustably supporting the guiding member, a spring mounted in the guiding member for resiliently holding the valve seated, a yoke carried by the casing and projecting above the upper end of the guiding member, coacting means carried by the yoke and guiding member for holding the guiding member relatively to the casing, and adjustable means mounted in the yoke and guiding member for regulating the tension of the spring.

2. A safety valve, including a base having a plurality of different diametered portions, a valve seat removably mounted within the intermediate diametered portion, a valve mounted for movement upon the seat, a valve guiding member disposed above the valve within the enlarged diametered portion of the base, a casing surrounding the valve and guiding member, a spring mounted in the guiding member for resiliently holding the valves seated, a yoke carried by the casing and projecting above the upper end of the guiding member, coacting means carried by the yoke and guiding member for holding the guiding member relatively to the casing, a stem adjustably mounted in the yoke and engaging the spring, and means for locking the stem fixedly with relation to the yoke.

3. A safety valve, including a base having a plurality of different diametered portions, a valve seat removably mounted within the intermediate diametered portion, a valve mounted for movement upon the seat, a valve guiding member disposed above the valve within the enlarged diametered portion of the base, a casing surrounding the valve and guiding member, said casing adjustably supporting the guiding member, a spring mounted in the guiding member for resiliently holding the valve seated, adjust-

able means mounted in the casing for controlling the spring, and a perforated dome removably connected to the upper end of the casing.

5 4. A safety valve, including a base having a plurality of different diametered portions, a valve seat removably mounted within the intermediate diametered portion, a valve mounted for movement upon the seat, a
10 valve guiding member disposed above the valve within the enlarged diametered portion of the base, a casing surrounding the valve and guiding member, said casing adjustably supporting the guiding member, a
15 spring mounted in the guiding member for resiliently holding the valve seated, a yoke carried by the casing and projecting above the upper end of the guiding member, coacting means carried by the yoke and guiding
20 member for holding the guiding member relatively to the casing, adjustable means mounted in the yoke and guiding member for regulating the tension of the spring, and a perforated dome removably connected to
25 the upper end of the casing.

5. A safety valve, including a base having a plurality of different diametered portions, a valve seat removably mounted within the intermediate diametered portion, a valve
30 mounted for movement upon the seat, a valve guiding member disposed above the valve within the enlarged diametered portion of the base, a casing surrounding the valve and guiding member, a spring mounted
35 in the guiding member for resiliently holding the valve seated, a yoke carried by the casing and projecting above the upper end of the guiding member, coacting means

carried by the yoke and guiding member for holding the guiding member relatively to
40 the casing, a stem adjustably mounted in the yoke and engaging the spring, means for locking the stem fixedly with relation to the yoke, and a perforated dome removably
45 connected to the upper end of the casing.

6. A safety valve, including a base having a plurality of different diametered portions in the lower end thereof, a valve seat removably mounted within the intermediate diametered portion thereof, a valve mounted
50 for movement upon the seat, a valve guiding member provided with a double diametered lower portion, the outer diametered portion being of a greater length and being disposed to fit within the enlarged diametered
55 portion of the base, while the inner reduced diametered portion surrounds the upper end of the valve to guide the same in its movement, the upper end of said valve guiding member being sealed, a spring mounted in the guiding
60 member and engaging the upper sealed end and the valve to hold the valve resiliently seated, said valve guiding member being provided with a fluid outlet to the space between the double diametered portions
65 thereof, and a casing secured to the base and housing the valve guiding member, the upper end of the valve guiding member being adjustably connected to the casing.

In testimony that I claim the foregoing as
70 my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE WILLIAM KELLER.

Witnesses:

J. H. PATTISON,
J. C. THOMASON.