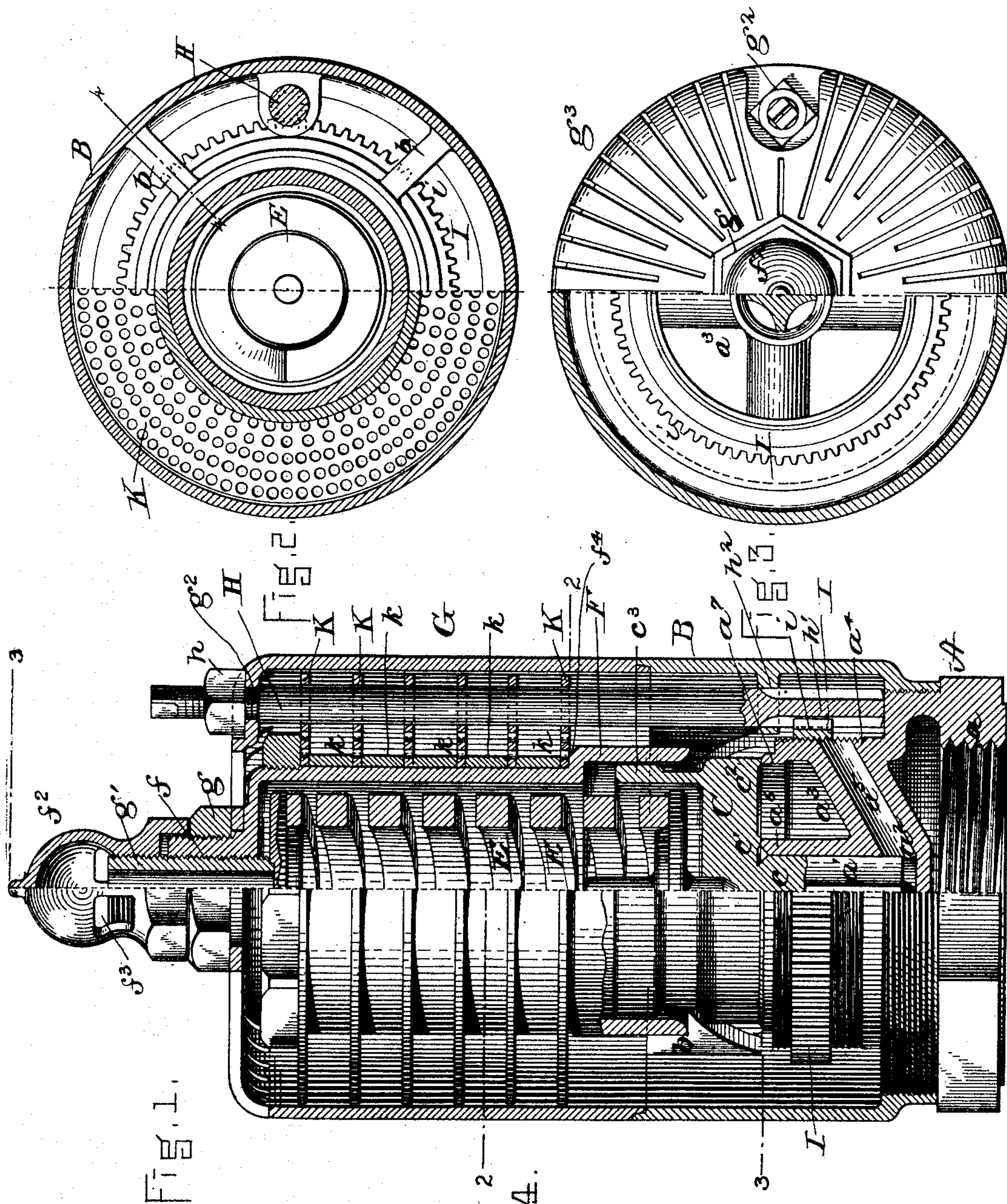


(No Model.)

C. B. BOSWORTH.
SAFETY VALVE.

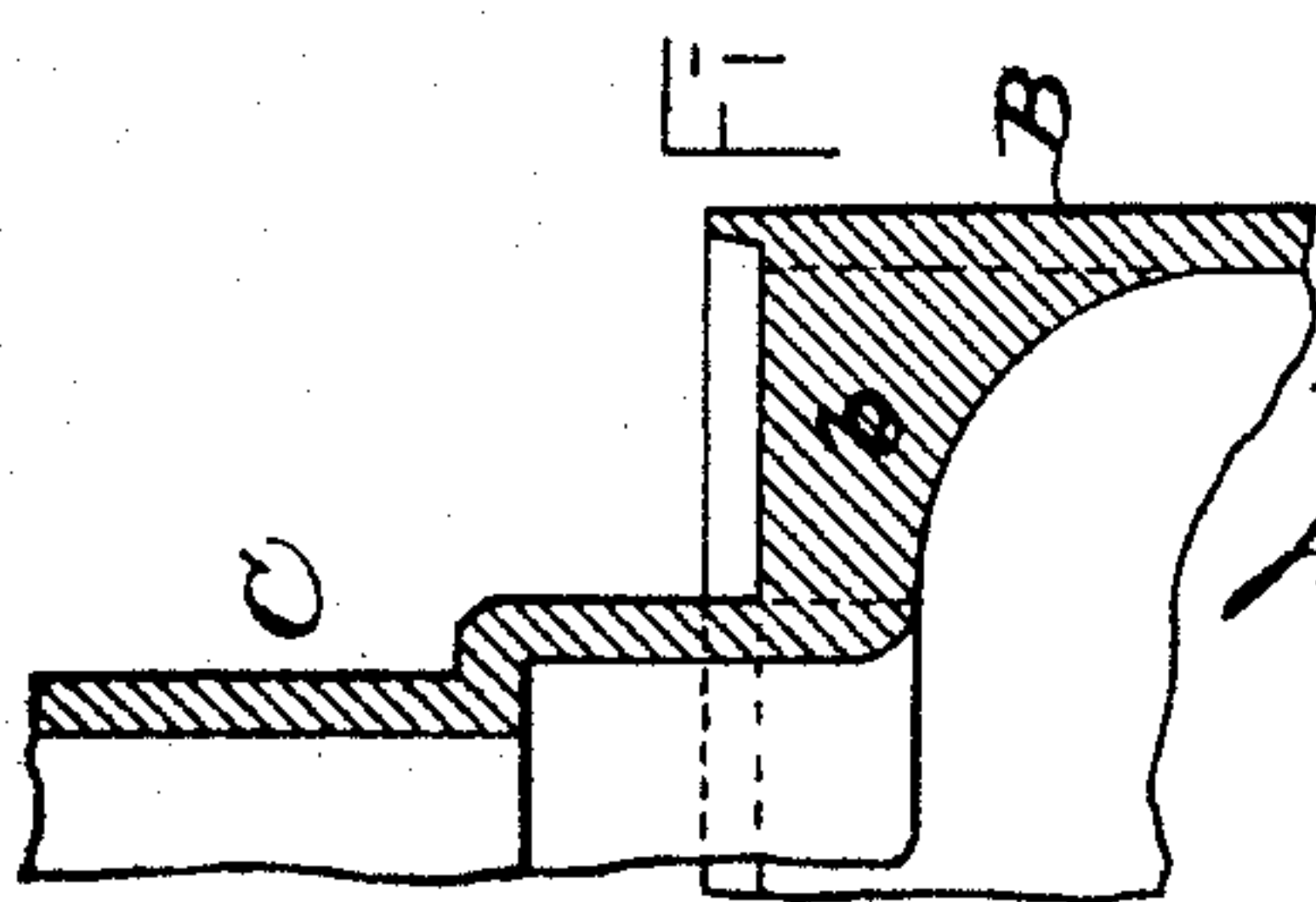
No. 585,884.

Patented July 6, 1897.



WITNESSES.

R. Henry Marsh,
H. L. Ostrand



INVENTOR.
Charles B. Bosworth,
per W. H. Singleton,
Atty.

UNITED STATES PATENT OFFICE.

CHARLES B. BOSWORTH, OF EVERETT, MASSACHUSETTS, ASSIGNOR TO THE CROSBY STEAM GAGE AND VALVE COMPANY, OF BOSTON, MASSACHUSETTS.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 585,884, dated July 6, 1897.

Application filed March 31, 1896. Serial No. 585,551. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BARTLETT BOSWORTH, a citizen of the United States, residing at Everett, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Safety-Valves; and I 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 an improvement in muffled safety-valves, more especially the kind shown in United States Patents Nos. 160,167 and 318,961.

The object of the present invention is to improve such a valve, to increase its efficiency, to protect the operative parts, and to better muffle the escaping steam.

In the annexed drawings, Figure 1 is a sectionalelevation. Fig. 2 is a horizontal section on the line 2 2, Fig. 1. Fig. 3 is a similar view on the line 3 3, Fig. 1. Fig. 4 is a vertical section on the line 4 4, Fig. 2.

The letter A indicates the base of the valve, having the threads a for securing the valve in position. In the center of this base is a cup-shaped well a' , having the closed bottom a^2 and several radial arms a^3 , which extend outwardly from the well a' and are connected to the periphery a^4 of the shell. These arms a^3 are hollow and have a bore a^5 , which extends from the interior of the well a' to the outside of the periphery a^4 , the latter being exteriorly threaded. The base A has at its top two concentric seats a^6 and a^7 , the two being spaced apart, as shown in Fig. 1, and in the same plane. Secured to the base A is the lower concentric casing B, there being a space between it and the periphery a^4 . Within the well a' projects downwardly the guide-stem c of the valve C, which has the seats c' c^2 , corresponding to and fitting the seats a^6 and a^7 . This valve C has the cylindrical top c^3 rising therefrom. Resting on top of the valve and centrally within the top c^3 is a stemmed disk D, on which rests the lower end of the valve-spring E. Surrounding this spring E is its protective casing F, the lower end of the latter being open and fitting snugly over the valve-top c^3 , the spring-casing F being

held to the casing B at the bottom by the radial arms or wings b . On the outside of the spring-casing F is the top casing G of the valve, fitting the lower casing B. The upper end f of the spring-casing F passes through a hole in the casing, such end f being hollow and threaded inside and outside. On the outside is screwed a nut g , which holds the parts together. On the inside is screwed a hollow screw-bolt g' , and above this and to its top is screwed a hollow cap f^2 , provided with holes f^3 and resting on the nut g . Down through a hole g^2 in the top of the casing G and secured by a nut h passes a rod H, its bottom end being adjacent to the threaded periphery a^4 , and at such place the end h' is grooved to form a pinion. The lower end of the rod H is held by a bracket h^2 , so as to steady it. Between this pinion and the periphery a^4 is a ring I, which has teeth i on the outside and is threaded on the inside to engage the periphery a^4 . The teeth of the pinion on the rod H engage the teeth on the ring I.

Surrounding the spring-casing F are several short cylinders k , which space apart annuli K. These annuli are perforated and extend from the casing F to the casing G. At the top a nut k' is threaded upon the casing F, locking the annuli and cylinders together, the lowest annulus resting on a shoulder f^4 of the casing E.

The top of the casing G is made with the several slots g^2 , which form passages from the interior of the valve to the outer air. When this valve is attached to a steam-boiler or other receptacle filled with fluid under pressure, there is exposed to this fluid or steam an annulus or that under portion of the valve C lying between the inner cylindrical well with its seat a^6 and the outer wall of the base A with its seat a^7 .

When the pressure of the fluid equals that at which the spring is compressed to hold the valve C to its seat, then the latter rises slightly and the fluid passing into the cylindrical well finds an additional area of the valve C uncovered, on which it may act, thus immediately raising the valve higher than it otherwise would, provided the openings through the arms a^3 have been so throttled or

diminished by the cylindrical ring I as to permit an accumulation of pressure within the cylindrical well and below the disk of the valve C, covering it to so lift it. This is the ordinary operation of the Crosby safety-valve described in the above patents. The improvement consists in being able to rotate this cylindrical ring I so as to regulate or adjust the operation of the valve in blowing from the exterior and upper part of the completed valve without being compelled to remove any portion of it.

A further improvement consists in constructing upon the upper part of the valve C the cylindrical projection above described to protect the top of the valve C in its chamber from the accumulation of steam when the valve is blowing. This is important, as it is well known that were this open to the inflow of the steam there would be thrown down upon the top of the valve B a pressure which would diminish its capacity to lift under the action of the steam within the cylindrical well. In other words, it would to a certain extent diminish its efficiency for discharging the increasing steam in the boiler upon which it may be attached. Whatever steam by chance there may be instantly passes off through the cylindrical screw-bolt g' and the hollow check-net f^2 .

Another improvement consists in mounting upon or surrounding the spring-casing F the perforated annuli K, through which the steam must pass in its exit when the valve is blowing, thus breaking up its velocity and diminishing its pressure before it shall pass

into the open air. All this, together with the slotted exterior casing G, subdues the fierce and shrieking sounds of the outrushing steam, as usually heard when blowing into the open air under a high pressure, without materially affecting the efficiency of the device as a safety-valve.

Having described my invention, what I claim is—

1. The combination of the base, A, having the cup-shaped well, a' , the hollow arms, a^3 , leading therefrom; the ring, I, for regulating the openings of the arms; the rod, H, extending outside of the valve and having the pin-ion, h' , for operating the ring, I; the valve, C, having the cylindrical top, c^3 ; the spring-casing, F, fitting snugly the top, c^3 ; and the valve-spring, E, within the casing, as set forth.

2. The combination of the exterior valve-casing; and the spring-casing spaced apart; with the perforated annuli, K, and the cylinders, k ; the top of the exterior casing being perforated, as set forth.

3. The combination of the exterior valve-casing, and the spring-casing spaced apart with the perforated annuli, K, and the cylinders, k , the top of the exterior casing having slits, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES B. BOSWORTH.

Witnesses:

OMAR H. GIBBS,

ARTHUR L. BOWKER.