

No. 657,086.

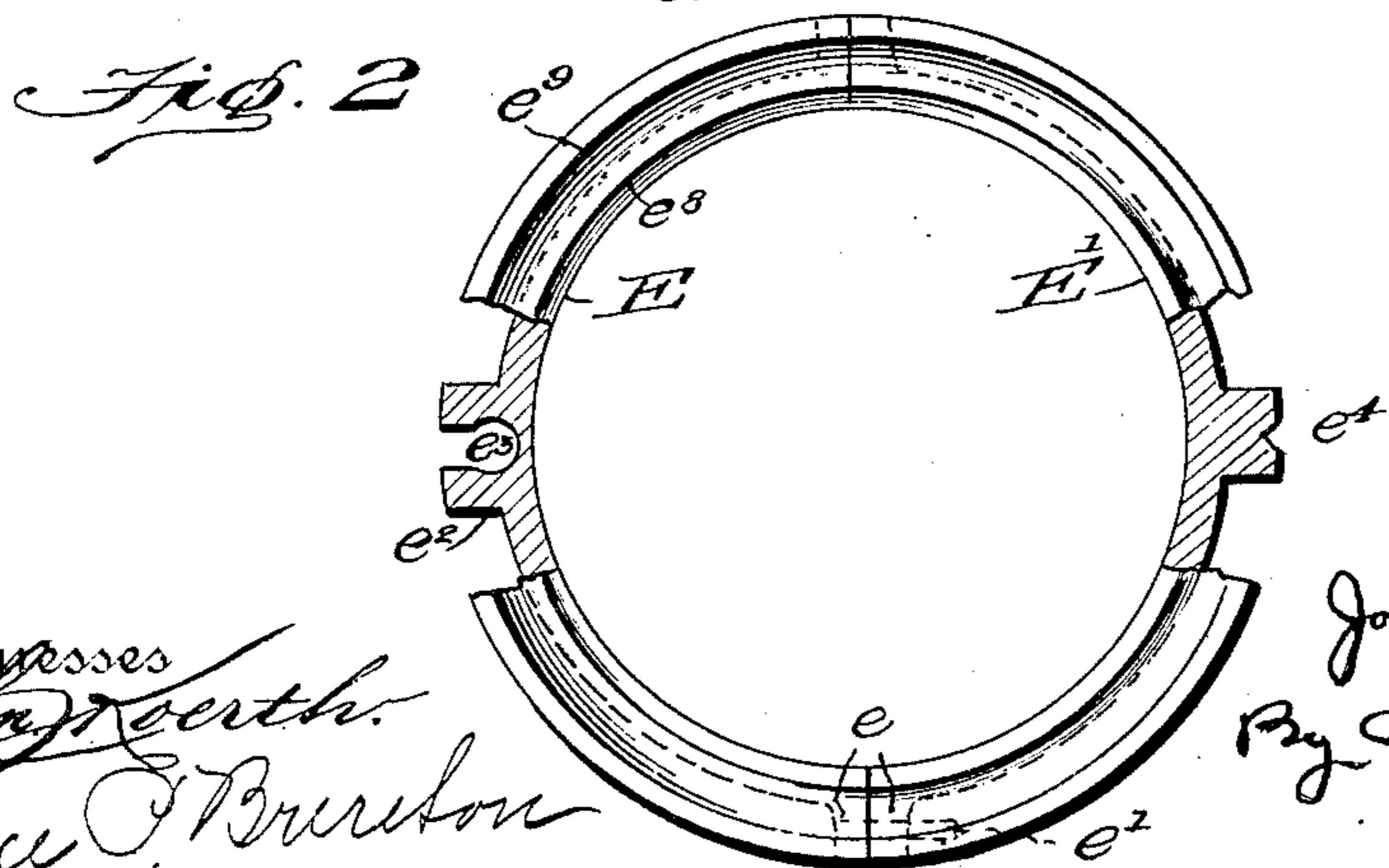
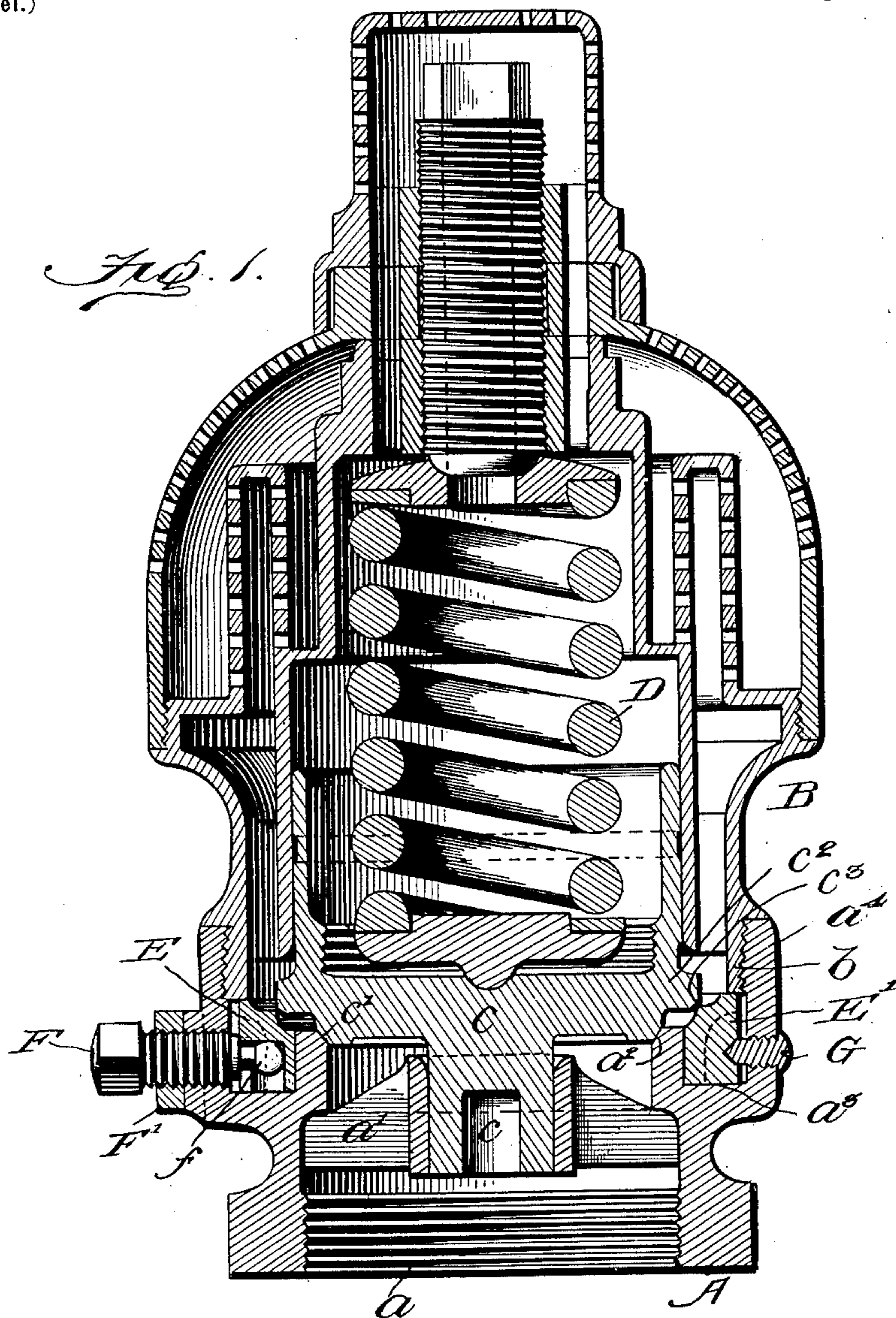
Patented Sept. 4, 1900.

J. M. COALE.
SAFETY VALVE.

(Application filed Jan. 12, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

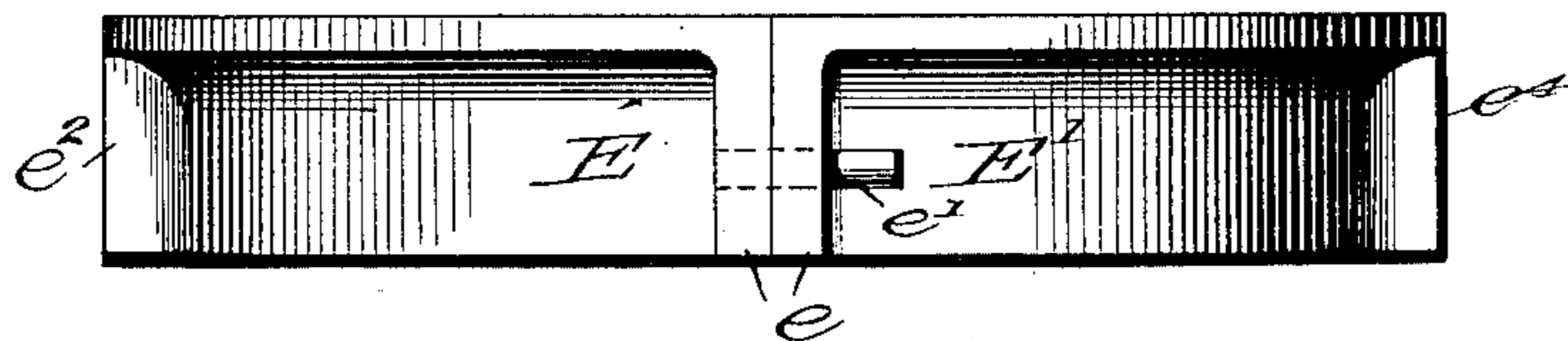


Fig. 4.

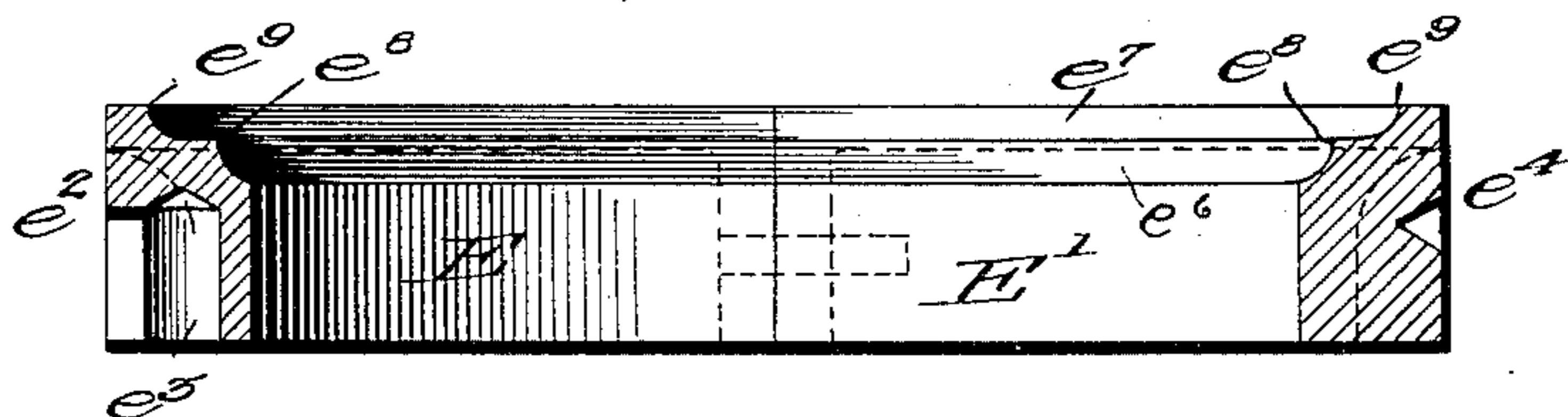


Fig. 6.

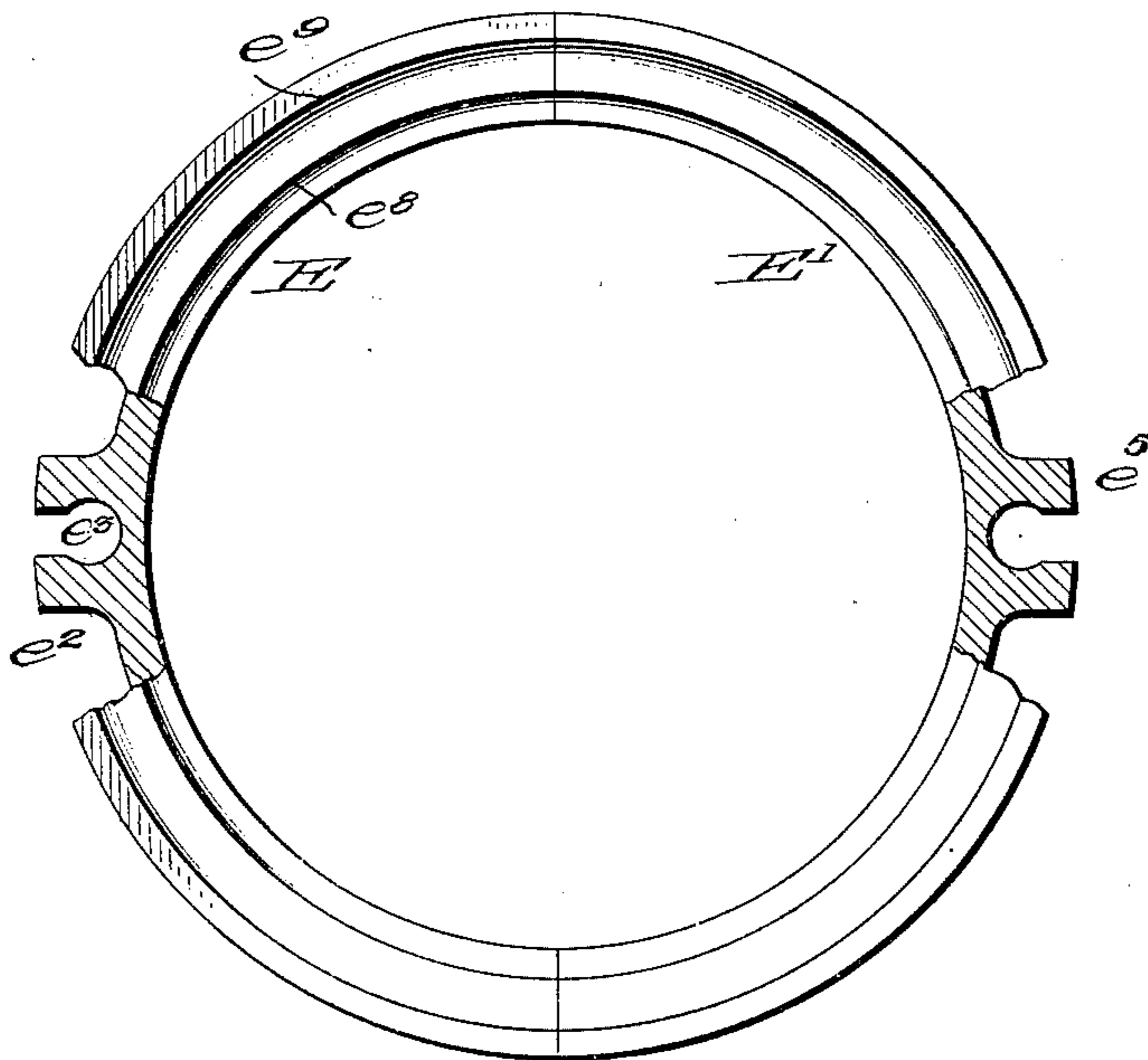
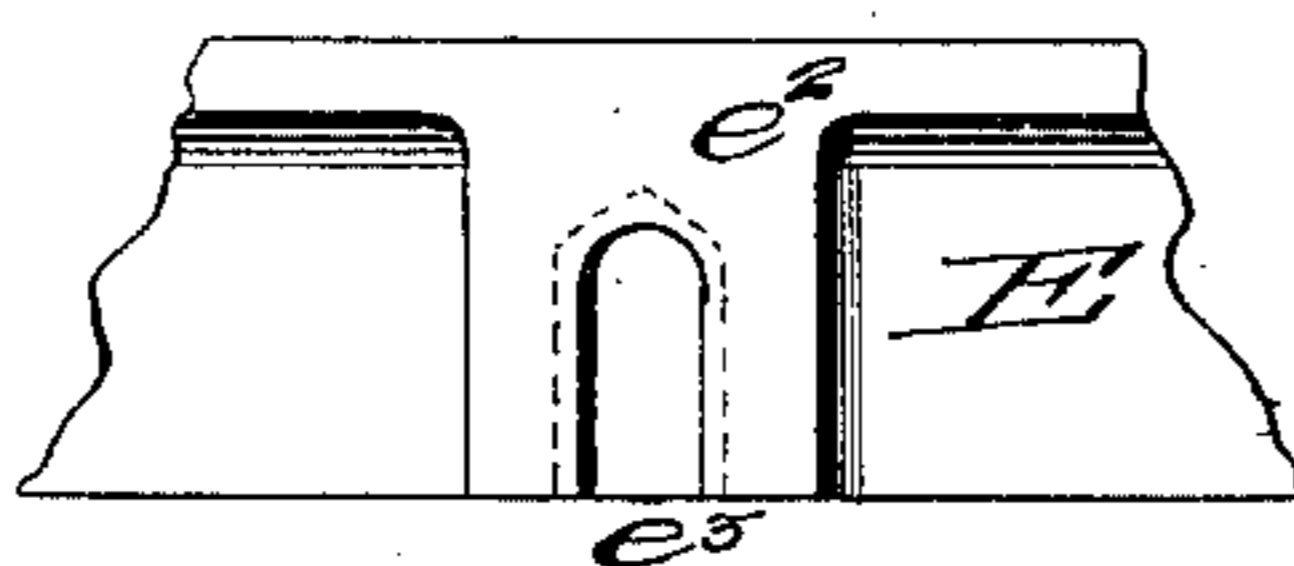


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH M. COALE, OF BALTIMORE, MARYLAND.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 657,086, dated September 4, 1900.

Application filed January 12, 1900. Serial No. 1,239. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. COALE, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Safety-Valves; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to safety-valves, and especially to those known as "pop-valves," being an improvement upon the invention shown in my former patent, No. 459,104, dated September 6, 1891. In that patent is disclosed a pressure-regulating ring which screws up and down on the outside of the valve-seat to vary the annular opening between said ring and the outer edge of the pop-chamber in order to vary the amount of reduction in steam-pressure which will take place when the valve blows. It is found in practice that screw-threaded rings, whether adjustable by the means shown in my aforesaid patent or in other ways, are liable to stick when allowed to remain untouched for some time. This makes it hard to move them and renders nice adjustment a matter of considerable difficulty. My present invention aims to overcome this trouble; and to that end it consists in a ring forming one wall of the pop-chamber made in two or more parts, one or more of which is or are movable radially with respect to the valve-stem or valve-seat, in distinction from a ring movable lengthwise or parallel therewith, as in my aforesaid patent. The divided or sectional ring is seated upon an annular shoulder or bed formed in the valve-casing and of sufficiently-larger diameter than the ring to allow it room to be moved in and out. The adjustment of the ring-sections is effected, preferably, by a screw tapped through the wall of the valve-casing, so that the adjusting can be done from the outside.

In the accompanying drawings, Figure 1 is a vertical diametrical section of a muffled safety-valve embodying my invention. Fig.

2 is a plan view of the sectional ring, partly in section and partly broken away. Fig. 3 is a side elevation of the same. Fig. 4 is a diametrical section thereof. Fig. 5 is an elevation of the rib containing the socket for the head of the adjusting-screw; and Fig. 6 is a modification of the ring, showing both sections capable of adjustment, the last four views being on an enlarged scale.

The lower section A of the valve-casing is provided, as usual, with the screw-threads a for attaching it to a steam-pipe, the guide a' for the valve-stem, the annular beveled or countersunk valve-seat a^2 , the annular well a^3 , concentric with and surrounding said seat, and the screw-threaded tubular part a^4 for the reception of the screw-threaded neck b of the upper section B of the valve-casing. The valve C has a central stem c , received in the guide a' , an annular beveled face c' to fit the seat a^2 , and a projecting flange c^2 , slightly undercut and having a beveled edge c^3 and forming the inner side and top of the pop-chamber. The valve is held to its seat by the spring D, as usual. The outer wall of the pop-chamber and also a portion of its bottom are formed by the pressure-regulating ring, which rests on the bottom of the well a^3 and is prevented from rising by the lower end of the neck b , which lies just above and touching said ring. The well a^3 , however, is wider radially than the ring, so that the latter can move in and out therein. To permit this, the ring is made in two or more sections, one or more of which can be moved radially by suitable means. In the drawings the rings are shown in halves E E', which for the sake of lightness are preferably made rather thin, as shown, with upright external ribs at certain points. Thus the meeting ends of the sections are preferably provided with ribs e , one of which may carry a tangential pin e' , passing freely through a hole in the other to keep the two parts in line. Any other equivalent means for doing this may be used.

At a point midway between the ends of one of the ring-sections is a rib e^2 for the attachment of the adjusting device. For this I prefer to use a screw F, tapped through the valve-casing and provided with a lock-nut F',

The inner end of the screw is provided with a head *f*, which is received in a socket *e*³ in the rib *e*², the socket being open at the bottom to enable it to be readily engaged with the head *f* when the ring is dropped into the well *a*³ in the casing. The cross-section of the socket shows a keyhole shape, which causes the ring-section to move with the screw when it is backed out or screwed in.

10 In Figs. 1, 2, 3, and 4 only one half the ring is arranged to be adjusted, the other half *E'* being held fast by a set-screw *G* in the valve-casing, engaging with a rib *e*⁴; but if desired, this section, too, may have means 15 for adjustment, such as a socketed rib *e*⁵ for an adjusting-screw, as indicated in Fig. 6.

The upper edge of the ring has two concentric countersinks *e*⁶ *e*⁷ at different levels. The upper edge *e*⁸ of the lower one *e*⁶ is arranged to come exactly at the upper outer corner of the bevel *c*³ on the valve. The contiguous surface of the upper countersink is level, rounding up to the edge *e*⁹, which comes inside of the lower end of the neck *b*. The 25 radial movement of the ring section or sections enlarges or reduces a narrow lune-shaped opening between the edge *e*⁸ and the bevel *c*³ and alters the capacity of the pop-chamber at the same time. This causes the 30 valve to close at a different pressure after blowing. By the movement of the edge *e*⁹ inward or outward the annular outlet from the pop-chamber is varied in size, which causes the valve to blow off more or less strongly, as the case may be. It will be seen that as the 35 ring-section has a sliding movement on its seat there is no tendency for it to stick, and, moreover, the screw enables it to be adjusted with the greatest nicety.

40 Having thus described my invention, what I claim is—

1. The combination with a pop safety-valve and its casing, of a sectional ring forming the outer wall of the pop-chamber, and means 45 for moving one or more of said sections radially.

2. The combination with a pop safety-valve and its casing, of a sectional ring forming the outer wall of the pop-chamber, means for 50 moving one of said sections radially, and

means for holding another section immovable.

3. The combination with a pop safety-valve and its casing, the latter having an annular well surrounding the valve-seat, of a sectional 55 ring forming the outer wall of the pop-chamber and seated on the bottom of said well, and means for moving one or more of the sections radially.

4. The combination with a pop safety-valve 60 having the outer upper edge of the pop-chamber beveled, of a ring forming the outer wall of said chamber, having a countersink with an upper edge lying in the plane of the upper corner of said beveled edge. 65

5. The combination with a pop safety-valve, of a ring forming the outer wall of the pop-chamber, said ring having two countersinks, the lower forming the pop-chamber and the upper the outlet from said chamber. 70

6. The combination with a pop safety-valve, of a ring forming the outer wall of the pop-chamber, said ring being made in sections, and provided with two countersinks, and means for moving one or more sections radi- 75 ally.

7. The combination with a pop safety-valve, of a ring forming the outer wall of the pop-chamber, said ring being made in halves, means for separating said halves, and means 80 for retaining them in line.

8. The combination with a pop safety-valve, of a ring forming the outer wall of the pop-chamber and made in halves, each provided with a rib at the meeting end, tangent pins 85 fixed in one rib of each pair and passing freely through the other, and means for separating said halves of the ring.

9. The combination with a pop safety-valve, of a ring forming the outer wall of the pop-chamber, said ring being made in halves, one or both of which has a socket, and a radially-arranged screw having a head engaging with said socket. 90

In testimony whereof I affix my signature 95 in presence of two witnesses.

JOSEPH M. COALE.

Witnesses:

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