E. B. KUNKLE.

SAFETY-VALVE.

No. 193,411. Patented July 24, 1877.

Fig. 1.

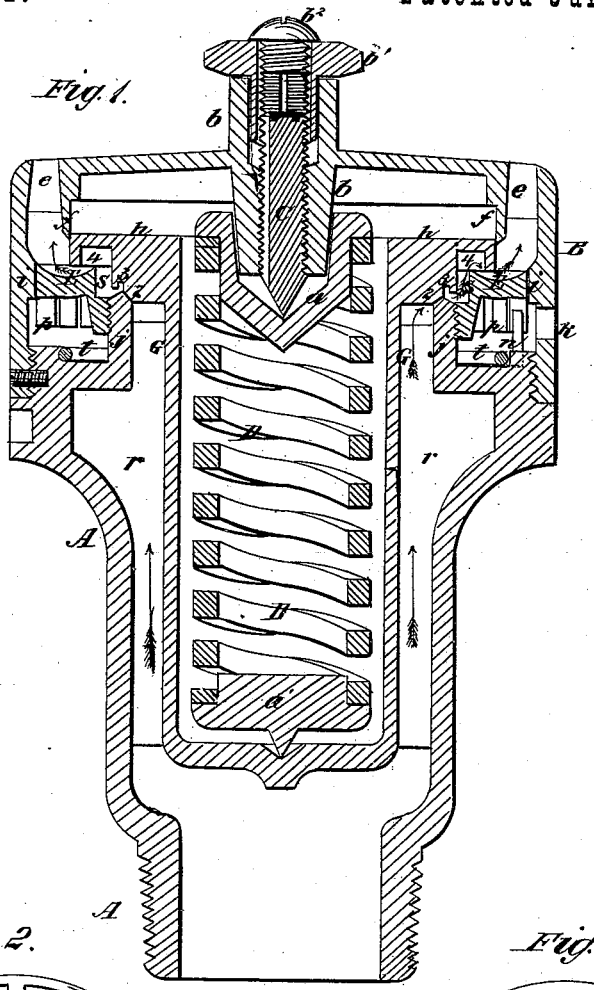


Fig. 2.

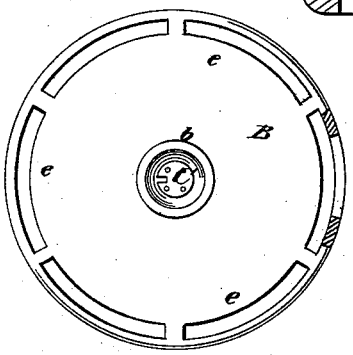


Fig. 4.

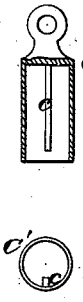
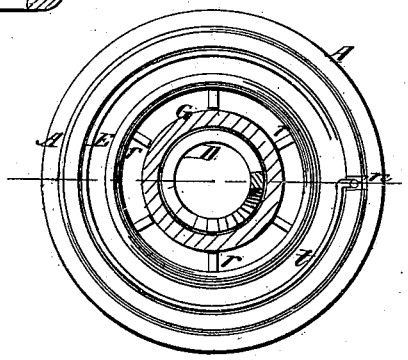


Fig. 3.



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ERASTUS B. KUNKLE, OF FORT WAYNE, INDIANA.

IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. **193,411**, dated July 24, 1877; application filed June 4, 1877.

To all whom it may concern:

Be it known that I, ERASTUS B. KUNKLE, of Fort Wayne, in the county of Madison and State of Indiana, have invented a new and Improved Lock-Up Safety-Valve, of which the following is a specification:

This invention has relation to safety-valves for steam-generators, and especially to valves which have applied to them means for preventing them from being tampered with by improper persons.

The invention will first be described in connection with the drawings, and then pointed out in the claims.

In the annexed drawings, Figure 1 is a diametrical section through my improved valve. Fig. 2 is a top view of the valve-cap reduced in diameter. Fig. 3 is a horizontal section, showing the spring-catch, spring, and spring-chamber and the ribs or feathers. Fig. 4 shows in section the key for adjusting the force of the spring on the valve.

Similar letters of reference indicate corresponding parts.

The letter A designates the tubular box or body of the instrument, which is enlarged above and contracted below, and constructed with a male thread cut on its lower end, and a number of holes in its largest end, to receive a spanner for screwing it into place on a boiler. A screw-thread is also cut on the upper end of the body A to receive a perforated cap, B, which is held fast by a small set-screw. (Shown in Fig. 1.) In the center of the cap B is a tubular hub, *b*, which is screw-tapped inside part of its length, and tapered outside below the top of the cap. Above the interior threaded portion of the hub *b* is a chamber, into which a nut, b^1, is applied, receiving inside of it a screw, b^2.

C is a cone-pointed screw, which is screwed into the hub *b* so as to bear centrally on a flanged cup, *a*. This screw C is grooved to receive the feather *c* on the inside of the barrel of a key, C′, by means of which key and a lever the screw can be turned, and a helical spring, D, compressed more or less, as may be required. After this adjustment a soft-metal cap or seal is stamped upon the perforated head of the screw C, and the latter locked by means of the jam-nut described.

The top of the cover B is slotted, as shown at *e e*, for the escape of steam during an alarm, and concentrically cast on the bottom of the cover is an annular flange, *f*, which laps over the largest part or upper end of the valve G, and shuts off communication between the interior of the cap B and the long spring-chamber of the valve. I thus exclude everything injurious from the spring-chamber. The interior of the cylindrical wall of the cap B is constructed with a raised rib or seat, *i*, against which the periphery of a regulator, E, is closely fitted, as shown in Fig. 1.

The valve G is composed of a flanged portion or head, *h*, surrounding the upper end of a cylindrical elongated cup, adapted to contain the spring D, which is compressed between the flange of cup *a* and a foot, *a′*, stepped on the bottom of the valve. The head *h* of the valve G is constructed with an annular bevel, 2, a small annular recess, 3, and a larger annular recess, 4, in its bottom side, which recess forms, in combination with the upper concave and stepped surfaces of the regulator E, a serpentine port, *s*, for the passage of the steam from the body A to the exit-slots *e e* through cap B, as indicated by the course of the arrows in Fig. 1.

The steam first escapes between the beveled portion 2 of the valve and a corresponding beveled seat formed on a flange, *j*, cast on the body A. It then takes the course indicated, being prevented from "blowing back" by the peculiar shape of the port.

The regulator E is a ring which is screwed on the outside of the flange *j*, and constructed with an annular concavity and a step, as above stated. Teeth *p*, or their equivalents, are formed around the bottom of the regulator, and an oblong hole, *k*, is made through the skirting of the cap B, by which a rod can be used for turning the regulator about its vertical axis, and thus adjusting it higher or lower on the flange *j*, increasing or diminishing the capacity of the outlet-port *s*.

The regulator E is held fast, after it is properly adjusted, by means of a lip, *n*, which is formed on a spring, *t*, and which engages with the teeth *p*. By pressing the lip *n* inward the regulator will be disengaged from it, and may be adjusted as described.

It will be seen from the above description that the steam passing up between the ribs *r*, cast either on the body A or valve-cup, operates on the valve-flange *h*, to lift the valve from its seat and enlarge the port *s*, thereby compressing the spring D, which reacts to shut the valve when the steam in the boiler is reduced to a given or predetermined pressure.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In combination with the valve G, acted on by a spring and adjusting-screw, C, as set forth, the valve-head *h*, constructed with a beveled surface, 2, and annular channels 3 4, forming, in connection with the flange *j* and regulator E, a port, *s*, substantially as described.

2. The regulator E, provided with teeth, and working in connection with a catch, *n*, as and for the purpose specified.

ERASTUS B. KUNKLE.

Witnesses:
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