E. B. KUNKLE.

Lock-Up Safety-Valve.

No. 162,831. Patented May 4, 1875.

Fig. 1

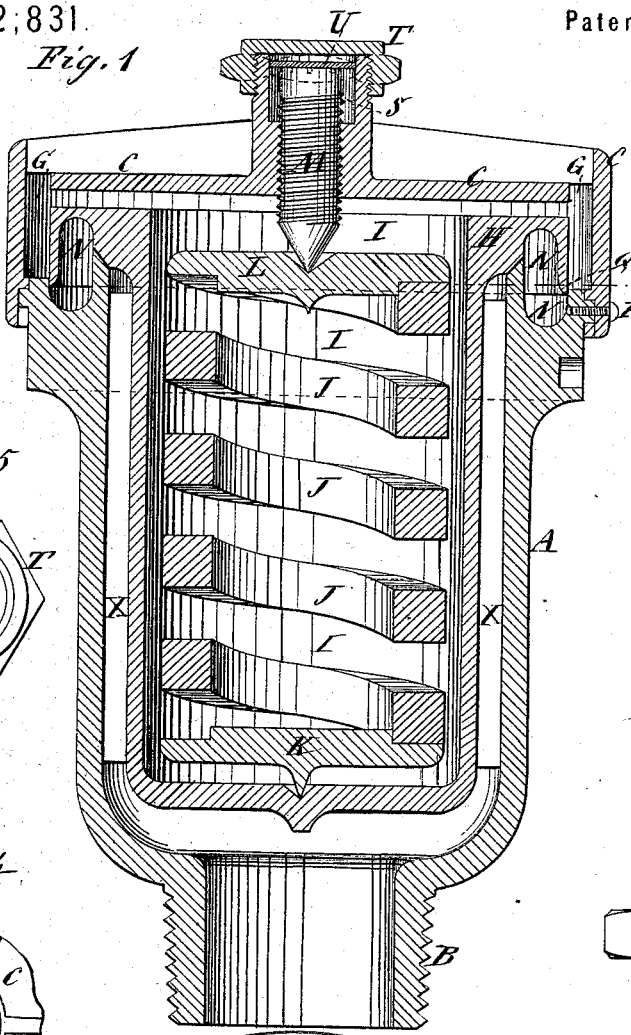


Fig. 3.

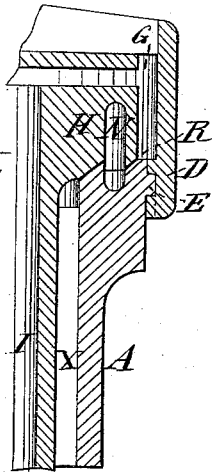


Fig. 5

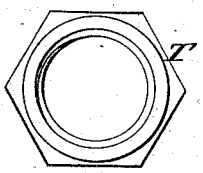


Fig. 6

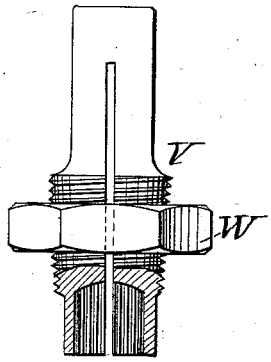


Fig. 4

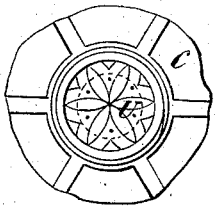


Fig. 2

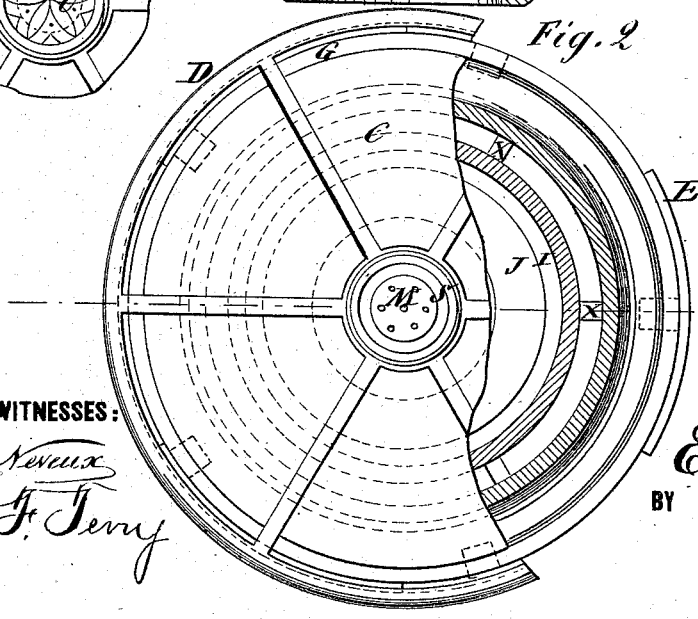
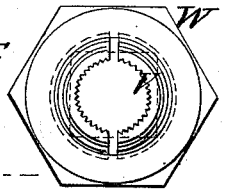


Fig. 7



WITNESSES:

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UNITED STATES PATENT OFFICE.

ERASTUS B. KUNKLE, OF FORT WAYNE, INDIANA, ASSIGNOR TO HIMSELF AND E. BOSTICK, OF SAME PLACE.

IMPROVEMENT IN LOCK-UP SAFETY-VALVES.

Specification forming part of Letters Patent No. **162,831**, dated May 4, 1875; application filed November 14, 1874.

To all whom it may concern:

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

My invention is an improvement in the class of safety-valves which are constructed with an annular chamber in the under side of a flange formed on the head thereof, the same being generally held to their seats by a rod or stem, which enters a central recess in the upper side of the valve.

The improvement relates to the construction and arrangement of parts, whereby economy of space is attained, and the sealed pressure-adjusting screw protected, as hereinafter described.

The adjusting-screw for regulating the tension of the spring is adapted for and provided with a split-wrench, with taper adjusting screw and nut for turning it.

Figure 1 is a sectional elevation of the improved lock-up safety-valve. Fig. 2 is partly a top view and partly a horizontal section. Fig. 3 is a detail in section, showing a modified form of the valve and its seat. Fig. 4 is a detail in top view, showing the seal applied for guarding the adjusting-screw of the spring. Fig. 5 is a plan of a cap for inclosing the top of the adjusting-screw. Fig. 6 is partly a side elevation and partly a sectional elevation of the wrench for turning the adjusting-screw, and Fig. 7 is an end elevation of the wrench.

Similar letters of reference indicate corresponding parts.

A is the steam-pipe, which is connected to the boiler or to another pipe at B. C is the cap to this pipe, for inclosing the valve. It has a flange, D, extending down the side of the pipe, and locking to it by the ribs E on the pipe and the grooves in the flange. It is also fastened against turning after being adjusted by a set-screw, F. There is an annular escape-passage, G, through the top of the cap next to the flange C. H is the valve. It has a deep chamber, I, in the upper side, in which is the pressure-spring, J, for holding it closed, the spring being arranged between the plates K and L, and confined against the bottom of the chamber by the adjusting-screw M in the cap. N are the channels in the valve-seat, to receive steam when the valve opens to amplify the lifting force on the valve, and insure the holding of it open until the pressure falls somewhat. The seat is thus divided into two parts, one of which may receive the valve into it a little, as at Q, or it may receive it on the surface, as at R. The former arrangement will probably be most efficient in retaining the steam in the chambers to increase the lift, but both will act in the same manner to a certain extent. The adjusting-screw M screws down into a socket, S, to be covered by a cap, T, and to guard against improperly changing it by unauthorized persons a seal, consisting of a lead disk, *v*, is put on and fastened by pressing some parts into holes or recesses in the top of the screw, so as to hold it on temporarily to prevent the application of a wrench for turning it. The wrench consists of the taper split socket-key V and nut W, the socket being made round and ribbed inside to fit grooves to be made in the head of the screw, to prevent the wrench from slipping round. This form is also difficult to imitate by false keys, but other forms may be used. The valve has wings X to keep it in proper position in the steam-pipe.

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

1. The cup or chambered valve H, the spiral spring J, and disks K L, respectively provided with a point and recess, and arranged within the valve, the pointed pressure-adjusting screw M, and the steam-pipe or casing A, having cap C, all combined as shown and described.

2. In a safety-valve, the combination of the steam-pipe cap C, having a socket, S, and screw-cap T with the sealed pressure-screw M, to permit the latter to be turned by a wrench, substantially as herein described.

ERASTUS B. KUNKLE.

Witnesses:

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HENRY ZIMERMAN.