(No Model.)

# H. C. WILDER.

## SAFETY VALVE.

No. 272,926. Patented Feb. 27, 1883.

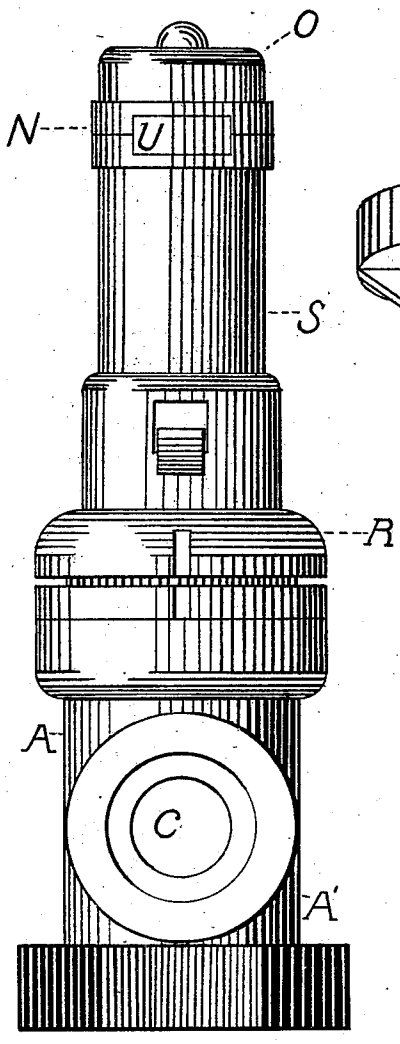



FIG. 1

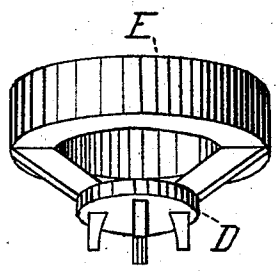



FIG. 3

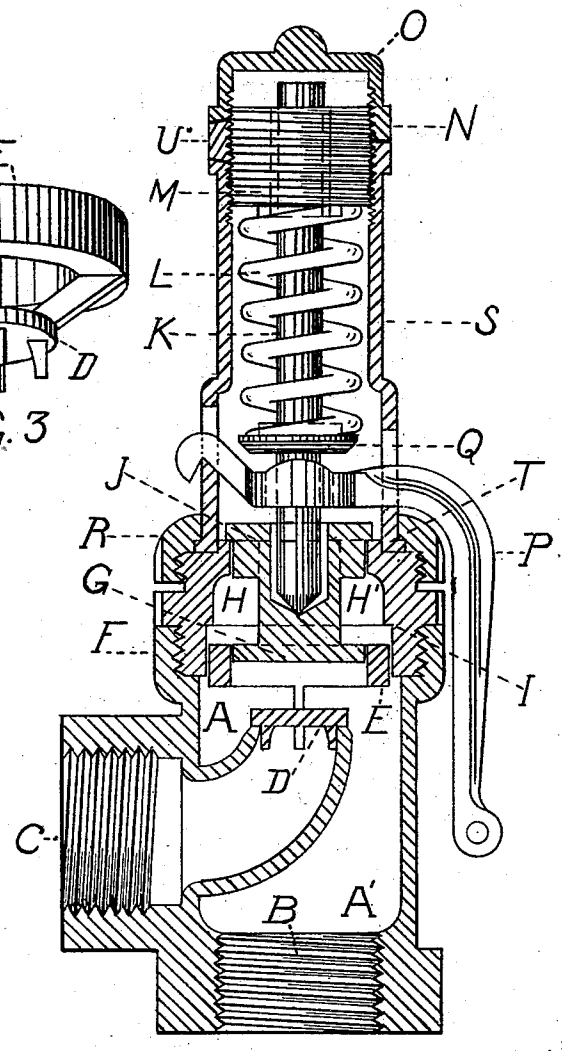



FIG. 2

Witnesses

B. J. Schweitzer

A. J. Corcoran.

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# UNITED STATES PATENT OFFICE.

HENRY C. WILDER, OF ASHBY, MASSACHUSETTS.

## SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 272,926, dated February 27, 1883.

Application filed July 19, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY C. WILDER, a citizen of the United States, residing at Ashby, in the county of Middlesex and State of Massachusetts, have invented a new and useful Safety-Valve, of which the following is a specification.

My invention relates to improvements in that class of safety-valves in which the relief-valve is intended to discharge with its full capacity while disengaged with its seat; and the objects of my improvements are, first, to construct a valve which shall automatically operate so as to relieve steam-boilers or other reservoirs without greatly reducing the pressure below that to which the valve is adjusted; second, to inclose the screw by which the adjustment is effected in such a manner that when sealed it cannot be readily tampered with; third, to provide a seal upon which may be stamped or otherwise marked a duplicate record of the manufacturer's or inspector's adjustment; fourth, to provide adjusting facilities by which the trip-lever can be placed on that side of the valve most easy of access; and, fifth, to approach simplicity of construction and symmetry of outline by arranging most of the essential parts on one concentric line. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a central vertical section of the entire valve, and Fig. 3 an enlarged perspective view of the balanced annular and relief valves connected.

Similar letters refer to similar parts throughout the several views.

The base-chamber A A′ is provided with the inlet-passage B and the discharge-passage C, each having a thread or other means by which proper connections can be effected. The discharge-passage C is partly inclosed within the base-chamber A A′ in such a manner that its communication with the interior of the base-chamber A A′ is only effected by the relief-valve D. The balanced annular piston E is joined to the relief-valve D by arms or equivalent connections, and is loosely fitted between the case F and the disk G. By this arrangement the balanced annular piston E and disk G, in addition to their functions hereinafter described, separate the balancing-chamber H H′ from the base-chamber A A′, and by the loosely-fitting parts the pressure in the base-chamber A A′ is communicated to the balancing-chamber H H′.

J is the escape-valve, provided with the disk G, the spindle K, the spring L, and the adjusting-screw M, by which the adjustment to a given pressure is effected.

I is the seat which limits the upward movement of the balanced annular piston E.

N is the binding-nut, provided with the protecting-cap O to prevent free access to the adjusting-screw M.

P is the lever arranged beneath the button Q, by which the valves may be frequently operated to prevent adhesion.

B is the coupling-nut, which holds the spring-case S in position by its bearing on the flange T. By this arrangement the trip-lever P is adjustable to different positions around the base-chamber A A′.

U is the seal, embedded or otherwise secured between the binding-nut N and the spring-case S, and may be made any convenient size and form, of lead or other material which cannot be removed without defacement. By this arrangement the binding-nut N cannot be removed without first removing the seal U.

The normal pressure in the balancing-chamber H H′ is equal with that in the base-chamber A A′; but when the pressure is sufficient to compress the spring L and open the escape-valve J the pressure in the balancing-chamber H H′ becomes less than the pressure in the base-chamber A A′, so that the balanced annular piston E closes with its seat I, thereby opening the relief-valve D until the pressure in the base-chamber A A′, acting on the disk G, is reduced so that the spring L closes the escape-valve J and the pressure in the balancing-chamber H H′ again becomes normal, thereby releasing the balanced annular piston E from its seat I, when the pressure in the base-chamber A A′ closes the relief-valve D.

I am aware that previous to my invention safety-valves have been made with escape-valves provided with a disk and base-chamber having a relief-valve. I therefore do not claim any of these things, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a safety-valve, the combination, with a relief-valve and an annular piston, of an escape-valve so arranged that when the pressure is relieved from one side of the annular piston the relief-valve is opened, substantially as shown and described.

2. In a safety-valve, the combination, with a relief-valve, of the balanced annular piston surrounding a disk connected with an escape-valve, and so arranged that when the escape-valve is opened the pressure is relieved from one side of the annular piston, thereby opening the relief-valve, substantially as shown and described.

3. In a safety-valve, the combination, with a balancing-chamber provided with an escape-valve, of a base-chamber having a relief-valve, when the said chambers are separated by a balanced annular piston surrounding a disk connected to the escape-valve, substantially as shown and described.

4. In a safety-valve, the combination, with a spring-case provided with an adjusting-screw, which is secured by a binding-nut having a protecting-cap, of a seal composed of such a material and so secured to the nut and case that it must be defaced to effect a removal of the nut, substantially as shown and described.

HENRY C. WILDER.

Witnesses:

HENRY CLAY WOOD,

JOEL G. WILLARD.