

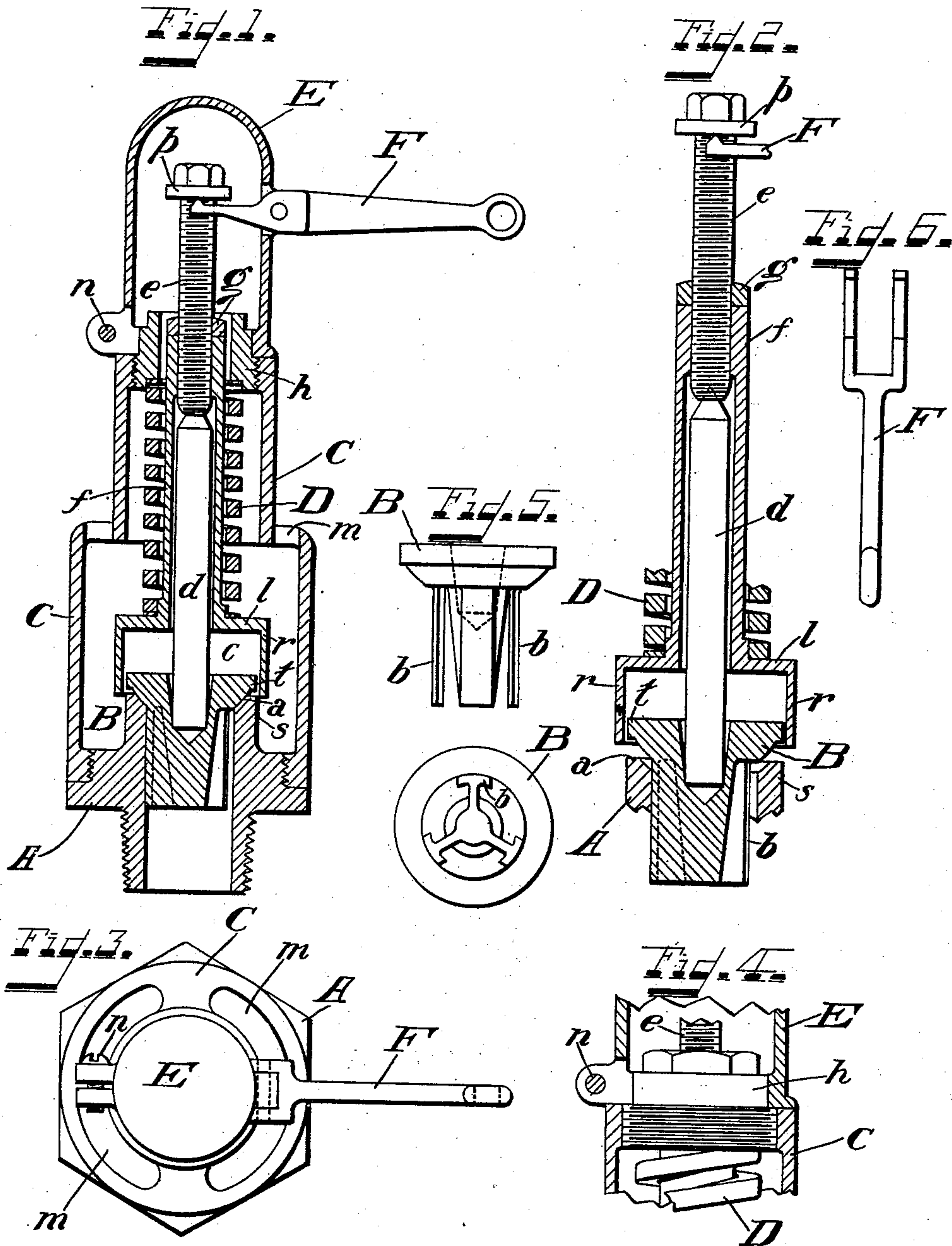
No. 708,039.

Patented Sept. 2, 1902.

B. HELLWIG.
POP SAFETY VALVE.

(Application filed Apr. 21, 1902.)

(No Model.)



Witnesses

George B. Mueller
Walter S. Kyle.

Inventor

Bernhard Hellwig
by Alfred M. Allen
Attorney.

UNITED STATES PATENT OFFICE.

BERNHARD HELLWIG, OF CINCINNATI, OHIO.

POP SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 708,039, dated September 2, 1902.

Application filed April 21, 1902. Serial No. 103,972. (No model.)

To all whom it may concern:

Be it known that I, BERNHARD HELLWIG, a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Pop Safety-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to safety-valves for relieving the pressure from steam-boilers and the like when the pressure reaches a certain maximum amount; and it consists of a certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed.

It has long been customary in order to increase the area upon which the steam may act to lift the valve sharply from its seat and allow it to be as promptly returned by the force of the coiled spring usually employed to form an annular flange or lip on the valve to engage a threaded adjustable ring mounted on the base around the valve, against which ring the annular lip on the valve engages to form an annular chamber to increase the valve area exposed to the steam-pressure when the valve is lifted slightly from its seat upon reaching the maximum pressure. These adjustable rings, under the jars and trembling of the valve as it is opened and closed, frequently work either up or down or away from the adjustment fixed at the factory for the proper opening of the valve. When the ring works up, the lip of the valve coming in contact with ring prevents the valve from properly closing, and should it work down the proper formation of an annular chamber is prevented and the valve becomes simply a relief-valve. The proper arrangement of these rings is a very delicate matter, and after the ring has once worked out of position it is difficult to readjust the ring without taking the valve entirely apart and sending it back to the factory.

The purpose, therefore, of my invention is to overcome this difficulty by a certain novel construction, to be hereinafter described and claimed, in which the increased area for the steam-pressure is formed by what I have called a "pop-lift," or a substitute for the adjustment-ring attached to the socket-spindle

for the valve and not mounted on the valve-base.

In the drawings, Figure 1 is a vertical longitudinal section of my improved valve closed. Fig. 2 is a similar longitudinal section with the casing removed and the valve open. Fig. 3 is a top plan view of my improved valve. Fig. 4 is a detail vertical section of the regulator-ring. Fig. 5 is a side and bottom view of the valve. Fig. 6 is a top view of the valve-lever.

A is the base-plug, which is screwed into the boiler and formed with the conical valve-seat *a*, and B is the valve, provided with the usual guide-wings *b b* and the central socket *c* for the reception of the spindle *d*, through which the pressure on the valve is regulated. The upper end of this spindle is conical and fits into a central conical recess in the lower end of the regulating-screw *e*. This regulating-screw engages the socket-spindle *f*, provided with the lock-nut *g*, and the upper end of the socket-spindle is mounted loosely in the regulator-ring *h*, which is screwed into the upper end of the valve-casing C, this valve-casing having the openings *m* and being screwed into the valve-base to form a casing for the valve. The lower end of the socket-spindle *f* is expanded into a disk *l*, and between this disk of the socket-spindle and the regulator-ring *h* is mounted the coiled spring D, of sufficient strength to obtain the necessary pressure on the valve to hold it closed until the maximum pressure within the boiler is attained. It will be evident that by adjusting the regulating-screw the proper tension can be obtained on the valve to prevent its opening until the pressure of the steam within the boiler has reached the maximum desired. The upper end of the regulating-screw is covered by the bonnet E, which is split at its lower end, mounted on the regulator-ring, and secured by tightening the screw *n*, while F is a lever pivoted to the bonnet, with its bifurcated inner end engaging the under side of the head *p* of the regulator-screw, so that when desired the valve can be lifted to open same by hand.

In order to obtain an increased area for the steam to act upon to lift the valve suddenly from its seat, I form a ring or pop-lift *r* on the plate *l* of the socket-spindle *f*. This ring

engages around the cylindrical upper portion
s of the base A, and the socket-spindle is so
adjusted that the lower edge of the pop-lift
on the spindle will come just below the top
5 of the base when the valve is closed. The
upper end of the valve itself is formed with
an annular flange *t*, so that an annular cham-
ber is formed around the valve, which, taken
10 with the chamber formed by the socket-spin-
dle and ring *r*, gives sufficient area to throw
the valve suddenly off its seat when the maxi-
mum pressure is reached. In other words, I
obtain the same effect attained by the older
construction of valve-lip and adjusting-ring.
15 In my construction, however, the annular
chamber around the valve is formed by the
lower end of the spindle-socket and the ad-
justing-ring to coöperate with the lip on the
valve is dispensed with, while the proper ad-
20 justment is obtained by the regulator-ring *h*.
There is no ring mounted on the valve-seat
to get out of place under the jars and strains
of use, and no nice adjustment of valve-lip
to regulating-ring is required.

25 Having thus described my invention, what
I claim, and desire to secure by Letters Pat-
ent, is—

1. In a pop safety-valve, the combination,
with the valve and its seat, a spring for hold-
30 ing the valve closed and a spindle-socket sur-

rounding the valve-spindle against which said
spring acts, of a cylindrical pop-lift secured
to the spindle-socket and embracing the up-
per edge of the valve-seat base, to form an
annular chamber of a greater area than the 35
valve to insure a pop action therefor, sub-
stantially as shown and described.

2. In a pop safety-valve, the combination,
with the valve and its seat, of a casing for
same, a regulator-ring screwed into the up- 40
per portion of said casing, a valve-spindle
and regulating-screw therefor, and a spindle-
socket with coiled spring bearing between the
spindle-socket and the regulator-ring, sub-
stantially as shown and described. 45

3. In a pop safety-valve, the combination
with the valve and its seat, of a casing for
same, a regulator-ring screwed into the up-
per portion of said casing, a valve-spindle 50
and regulating-screw therefor, a spindle-
socket carrying a cylindrical pop-lift at its
lower end to embrace the upper edge of the
valve-seat base, with a coiled spring bearing
between the spindle-socket and regulator-
ring, substantially as shown and described. 55

BERNHARD HELLWIG.

Witnesses:

BERTHA PETERS,
ADOLPH PETERS.