

(No Model.)

J. W. BALL.
SAFETY VALVE.

No. 477,487.

Patented June 21, 1892.

Fig. 1.

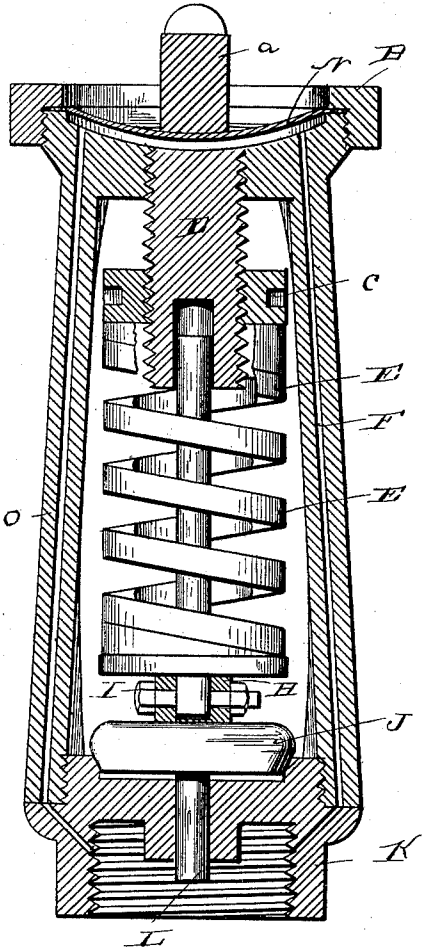


Fig. 2.

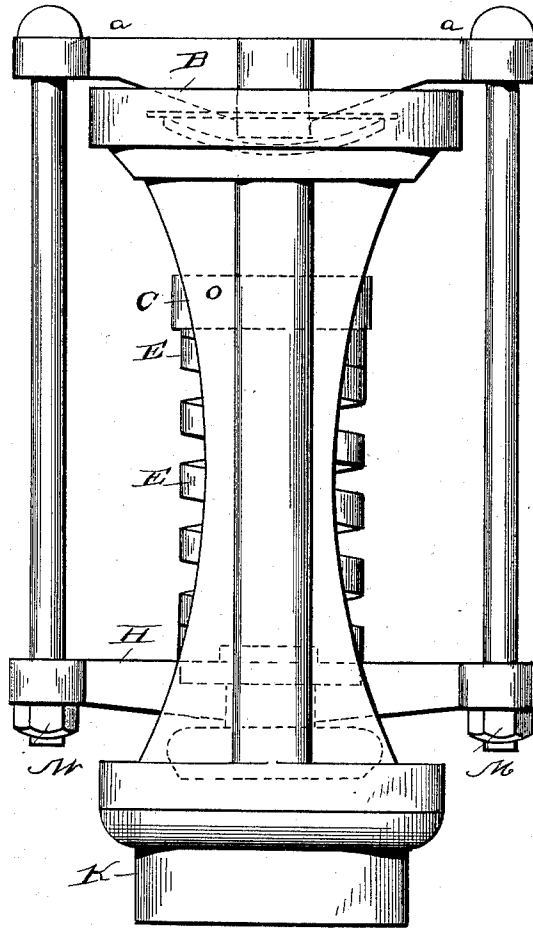


Fig. 3.

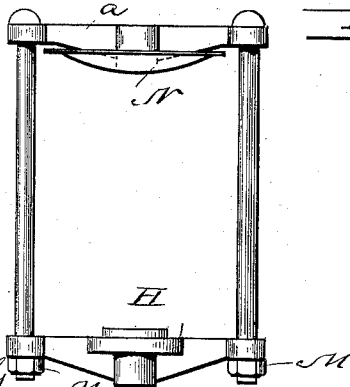
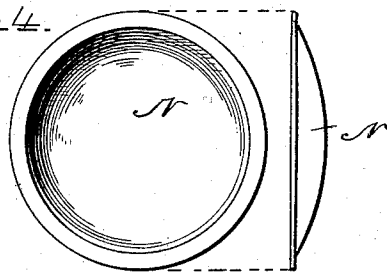


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN W. BALL, OF RUSK, TEXAS.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 477,487, dated June 21, 1892.

Application filed September 11, 1891. Serial No. 405,440. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. BALL, a native of Canada, and a citizen of the United States by adoption, residing in Rusk, in the State of Texas, have invented a new and useful contrivance for improving the efficiency and rendering safe and certain the action of safety-valves upon steam-boilers, gas, air, or water tanks, reservoirs, or receptacles of any sort for fluid or gaseous matter to be used for mechanical or experimental purposes, of which the following is a specification.

The object of this invention is to secure the prompt, safe, and reliable action of the safety-valve and free the valve from its tendency to stick in its seat because of corrosion or other forces.

The essential feature in its nature is to present more surface to the action of the steam, &c., and thus multiply the points of its bearing, and thus enable the steam, gas, &c., to have a compound action upon the valve and make a certainty of its fulfilling its function.

Figure 1 shows a vertical cross-section of the safety-valve. Fig. 2 shows elevation of the safety-valve. Fig. 3 shows the detached elevation of the yoke and flexible steel disk. Fig. 4 shows the plan and edge view of the flexible steel disk N.

Similar letters refer to similar parts in each and all views.

A is the top horizontal piece of the yoke, slightly concaved on the lower side to receive the flexible steel disk N.

B is the circular top of the contrivance, which screws onto the frame, compressing the edges of the flexible steel disk.

C is the adjusting-nut, which constitutes the direct bearing of the guide-block D upon the spiral spring E.

D is the guide-block, threaded to pass through the upper part of the frame and forming a part of it, receiving the adjusting-nut C by means of threads, and also receiving stem of valve proper in a cavity in the end and answers for a central guide.

E is the spiral spring, which presents the resistance to the valve proper J and the disk N.

F F are the tubes, which are inside of the ribs O O, which conduct the steam, gas, &c.,

from the boiler or reservoir to the point of its application to the flexible steel disk N.

G G are the bolts which connect the horizontal parts of the yoke, Fig. 2.

H is the lower horizontal part of the yoke. 55

I is a threaded pin, which fastens the lower part of the yoke H to the valve-stem, Fig. 1.

J is the valve proper in its seat, with the stem passing upward through the center of spiral spring E and entering end of guide-block D. 60

K is the circular base of the entire contrivance, it being threaded inside to screw onto projecting nipple of the boiler or reservoir, also screwing into circular frame, connecting bottom of frame at its top and having holes to connect with the tubes F F in ribs O O and having a groove to connect such holes, groove to be in the top face of the flange, in order that the steam or gas entering either hole may have access to the other through the groove, that part of the flange on either side of the groove to be steam-tight, and having a circular hole through its center to receive and guide the lower end of the valve-stem L and openings around such central hole to admit the steam or gas to the space under the valve proper and secure direct pressure from the boiler or reservoir upon the under side of the valve proper, as well as upon the disk N, by means of the tubes F F. 80

L is the lower end of the valve-stem.

M M are the nuts on the bolts connecting horizontal parts of the yoke, Fig. 3.

N is the flexible steel disk, Fig. 4. 85

It is a fact well known to engineers that there is no safety-valve in use which is absolutely certain at all times and under all circumstances to blow off at the pressure for which it is set. 90

I claim—

1. In a safety-valve, the combination, with the valve J, its stem, the guides therefor, the yoke connected to said stem, and the spring, of the flexible metallic disk N, having a bearing against said yoke, substantially as specified. 95

2. In a safety-valve, the combination, with the valve J, its stem, the yoke connected to said stem, and the guide-block receiving said stem, 100

of the flexible disk having a bearing against said yoke, the resistance-spring for the valve and disk, and the pressure-inlet passages leading to said disk, substantially as specified.

5 3. In a safety-valve, the combination of the valve proper, its stem, the yoke connected to said stem, the flexible convex disk confined at its edges and having a bearing against the yoke, and the pressure-passages leading to
10 said disk, substantially as specified.

4. The combination, in a safety-valve, with the valve proper and its resistance-spring, of the flexible disk connected to the stem of said valve and the pressure-inlet passages communicating with the under surface of said valve,
15 whereby a conjoint action of said disk and the valve is obtained under excess of pressure, substantially as specified.

5. The combination, with the yoke, the frame, the valve proper seating therein and having 20 its stem connected to said yoke, the guide-block, the adjusting-nut thereon, and the resistance-spring confined between the valve and said nut, of the flexible metallic disk having its edges confined in said frame and having a 25 bearing against the yoke and the passages communicating with the pressure source and the surface of said disk, whereby the action of said disk and valve is compounded, substantially as specified.

August 10, 1891.

J. W. BALL.

Witnesses:

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J. W. GRAMMER.