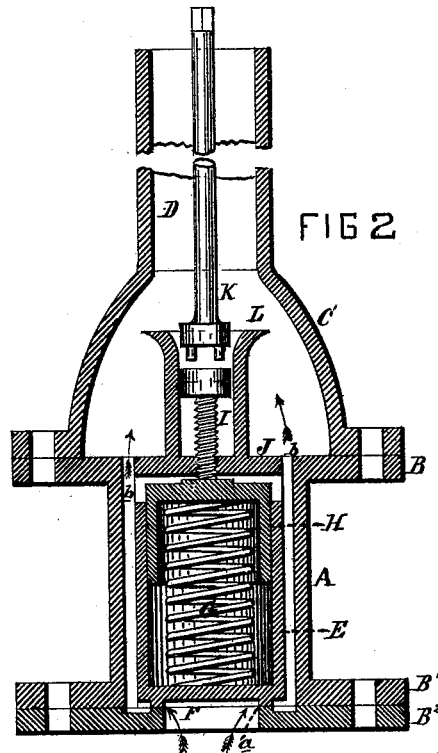
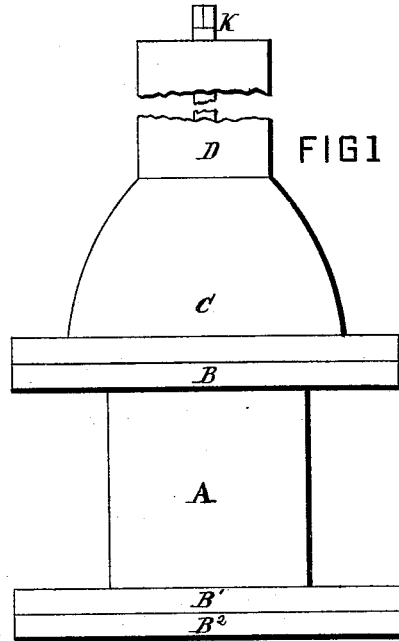


I. M. PHELPS.

SAFETY-VALVE.

No. 189,493.

Patented April 10, 1877.



WITNESSES.

*Albert A. Freeman*

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INVENTOR.

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# UNITED STATES PATENT OFFICE

IRA M. PHELPS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO SAMUEL L. GARRETT, OF SAME PLACE.

## IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. **189,493**, dated April 10, 1877; application filed September 9, 1876.

*To all whom it may concern :*

Be it known that I, IRA M. PHELPS, of the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Safety-Valves, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is to provide a safety-valve of a cheap and simple construction, which is not liable to get out of order, and which may be readily set, by means of a key, to blow off at any desired pressure, and, when set and the key removed, any tampering with the same is prevented.

In my invention the ordinary lever and weight are dispensed with, and a spiral spring substituted, which is inclosed within a hollow cylindrical valve and a compression-cylinder, the compression-cylinder, which works within the valve proper, being operated by a set-screw in the upper part of the valve-chamber.

Figure 1 is an exterior view of my improvement in safety-valves. Fig. 2 is a vertical section of the same.

The valve-casing consists of a cylinder, A, having flanges B and B<sup>1</sup> at its upper and lower ends. On the upper flange a dome, C, is bolted, having an escape-pipe, D, projecting from it. The lower flange, B<sup>1</sup>, is bolted to a flange, B<sup>2</sup>, which is secured to the steam-boiler, and in the center of which the valve-seat is formed.

E, Fig. 2, is a hollow cylindrical valve with a closed bottom, which rests upon the annular valve-seat F. An annular projection, *a*, is also formed on the bottom of the valve, similar to the valve-seat F, by which means a close joint may be maintained, and all possibility of the valve sticking on the seat avoided.

G is a spiral spring, of suitable elasticity, placed within the cylindrical valve E, and

covered by a hollow compression-cylinder, H, which fits into the upper end of the cylindrical valve, and acts as a guide for the spring, and is depressed by means of a set-screw, I. This set-screw passes through a flange, J, at the upper part of the valve-chamber, and is made with a circular head and two openings, to accommodate the lugs on the lower end of the key K; or the head may be made square, or of any suitable form, to accommodate a socket-wrench.

The valve-chamber A is made considerably larger in diameter than the valve, so as to form a steam-passage around the valve. It is also furnished with ribs *b b b b*, to guide the valve as it rises from the seat. The escaping steam passes through the annular space around the valve, into the dome, and out through the pipe D.

The head of the set-screw I is surrounded with a funnel, so as to guide the key or wrench when it is inserted down a long length of pipe.

The set-screw I, by which the spring is depressed and the valve regulated to blow off at the desired pressure, is so far removed from the mouth of the escape-pipe D that it will be impossible for a person to tamper with it in the absence of the long-handle key or wrench. In shorter lengths of pipe an additional safeguard may be adopted, in the way of a perforated cover fitting over the end of the pipe, and secured by a lock and key.

What I claim as my invention is—

The compression-cylinder H, set-screw I, valve-casing A, and funnel L, adapted to guide the key K, in combination with the safety-valve E, substantially as shown and described.

IRA M. PHELPS.

Witnesses:

ALBERT A. FREEMAN,  
JEH. S. PIEN.