S. HARRISON.

SAFETY-VALVE.

No. 185,101. Patented Dec. 5, 1876.

FIG. II

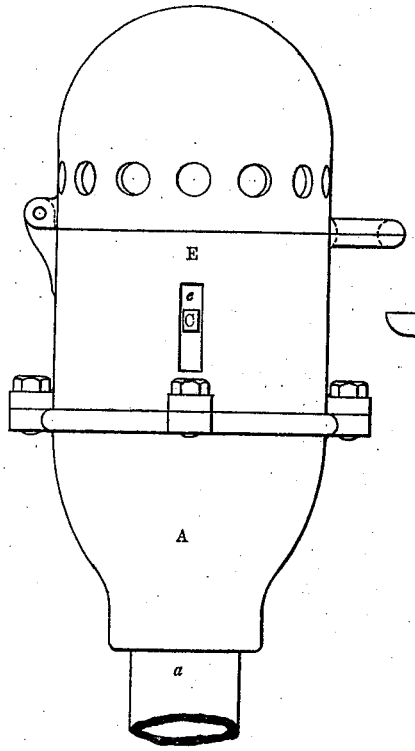



FIG. I

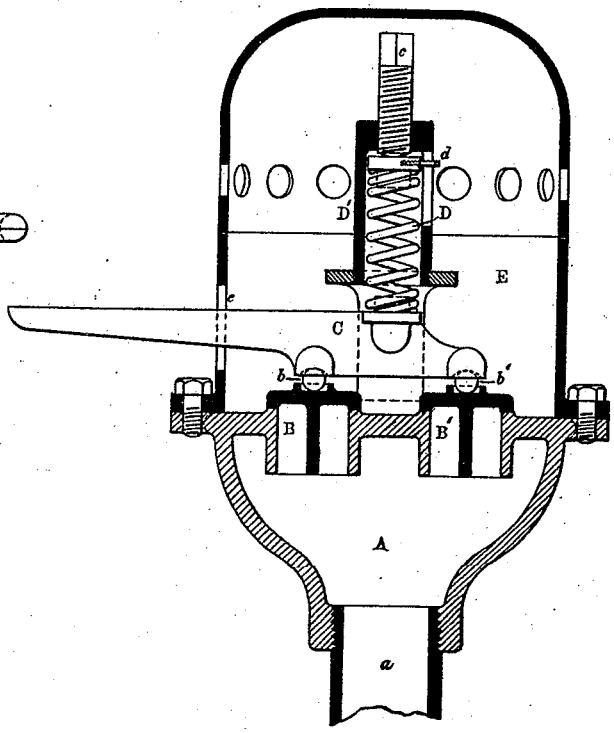
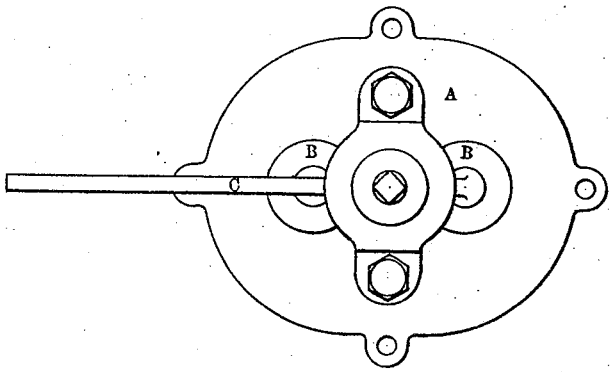



FIG. III




WITNESSES.

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# UNITED STATES PATENT OFFICE.

SAMUEL HARRISON, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. **185,101**, dated December 5, 1876; application filed September 9, 1876.

*To all whom it may concern:*

Be it known that I, SAMUEL HARRISON, of the city of Baltimore and State of Maryland, have invented certain Improvements in Safety-Valves, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention relates to certain improvements in that class of safety-valves in which the valves, the devices for holding them to their seats, and other parts thereof affecting their operation under steam-pressure, are inclosed within a casing adapted to be locked, or otherwise secured against unauthorized tampering with the said valves and their connections aforesaid.

In the description of a safety-valve embodying my improvements which follows, due reference must be had to the accompanying drawing, forming a part of this specification, and in which—

Figure 1 is a vertical section of my improved valve; Fig. 2, an exterior view of the same as seen from a different point, and Fig. 3 a plan of the valve with the casing removed.

Similar letters of reference indicate similar parts in all the figures.

A is the shell, connected to the boiler at *a*. B B′ are valves, seated in the plate forming the upper part of the shell A, and adapted to open in an upward direction. The valves B B′ are provided with balls *b b′*, which rest in depressions therein, and upon which the weighted lever or bar C is supported. D is a spiral spring, confined within the case D′, with its lower end bearing upon the lever C at a point equidistant from the centers of the valves B B′. The tension of the spring D is adjusted by means of a screw, *c*, a pointer, *d*, in connection with a graduated scale on the exterior of the case D′, indicating the pressure upon the valves. E is the casing, divided into two sections, and secured to the shell A by means of bolts. The upper and lower sections of the casing E are hinged together, and provided with means for attaching a lock or other securing device. An extension of the lever C passes through a slot, *e*, in the casing, and is used to relieve either of the valves B B′ from the pressure of the spring D, in a manner hereinafter described.

In cases where the extended portion of the lever C is of such weight as to materially increase the pressure upon the valve B, the position of the spiral spring with reference to the centers of the valves is arranged to counterbalance the said extension, and thereby effect an equal tension on both valves.

The valves being subjected to a common weight or tension through the agency of the spring and lever, the steam, upon reaching the pressure indicated by the pointer *d*, causes both valves to be opened simultaneously, the steam escaping through apertures in the casing E.

When it is desired to cause the escape of steam at a pressure below the maximum tension indicated by the pointer, the extended end of the lever is either elevated or depressed, which action places the entire pressure of the spring upon one valve, leaving the other free to be raised by the steam from below.

It will be understood that when the spring is compressed to the required tension, and the casing closed and locked, all communication with the valves from the exterior of the casing, except through the medium of the lever C, is cut off; and that the loading of the projecting end of the lever, instead of increasing the maximum pressure-point, actually reduces it, as the tension on the valve B′ is lessened by the counterbalancing effect of the weight added. By attaching weights to the lever by means of ropes and pulleys, in such manner as to induce its elevation, the effect produced is substantially the same, the reduction of weight in this case being upon the valve B.

Having thus described my invention, what I claim as new, and wish to secure by Letters Patent of the United States, is—

A safety-valve having two valves, adapted to open by pressure in the same direction, and held to their seats by a spring placed cen-

trally between them, the said valves being connected by a lever in such manner as to cause the opening of one valve by the depression of the outer end of the lever, and the opening of the other valve by the elevation of the said outer end of the lever, substantially as herein specified.

In testimony whereof I have hereunto subscribed my name this 31st day of August, in the year of our Lord 1876.

SAMUEL HARRISON.

Witnesses:

B. RUSSELL SNYDER,

GEORGE C. POTTS.