J. H. Winn,

Steam Safety Valve.

No. 21,390. Patented Aug. 31, 1858.

Fig. 1.

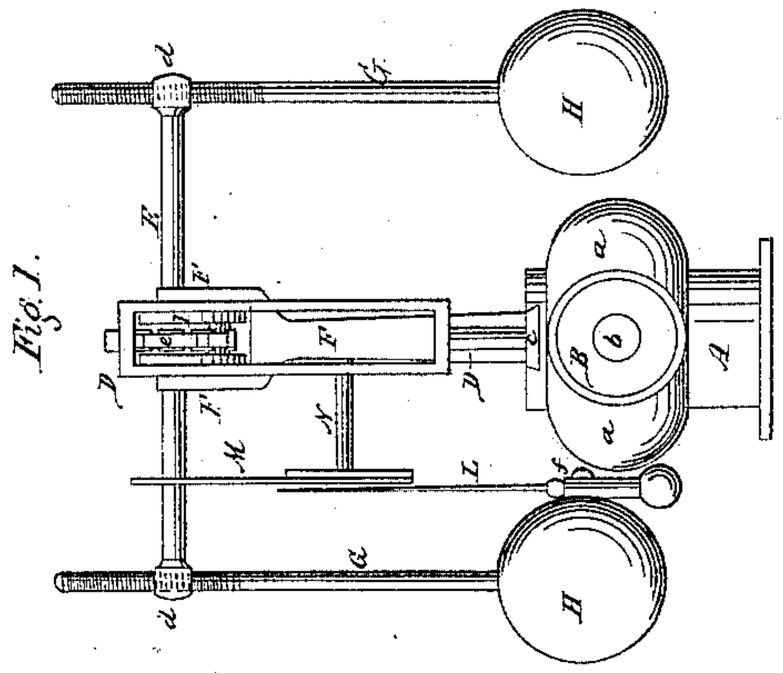
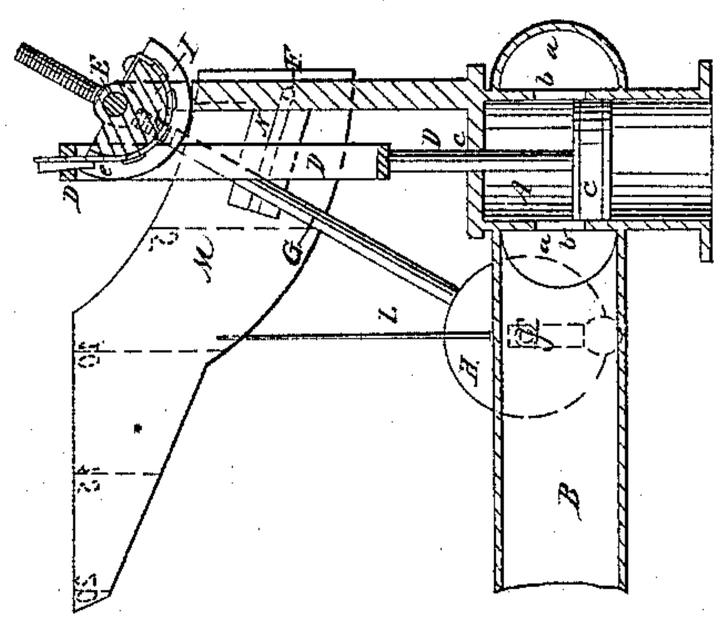


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES H. WINN, OF PORTAGE, WISCONSIN.

SAFETY-VALVE AND PRESSURE-GAGE.

Specification of Letters Patent No. 21,390, dated August 31, 1858.

To all whom it may concern:

Be it known that I, JAMES H. WINN, of Portage, in the county of Columbia and State of Wisconsin, have invented a new and Improved Apparatus Constituting a Combined Safety-Valve and Steam-Pressure Gage; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front view of the apparatus, and Fig. 2 is a central section of the same in a plane at right angles to Fig. 1.

Similar letters of reference indicate like parts in both figures.

This invention consists in a novel and very simple method of applying and arranging one or more weighted pendulous rods and an index and dial, in combination with a piston valve and suitable arrangement of steam passages, whereby the escape of steam from a boiler as soon as it arrives at any desired pressure is provided for and any pressure of steam below that at which it is desired to escape is correctly indicated by the index on the dial.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A, is an upright cylinder having an open bottom and having its upper part surrounded by an annular chamber *a*, which communicates with its interior by several openings *b*, *b*, and from which there branches off a pipe B. This cylinder is intended to be secured on the top of the boiler, over a suitable opening.

C, is the piston, which constitutes the safety valve, fitted to work steam tight within the cylinder A, and having attached to it a rod D, which works through a guide *c*, at the top of the cylinder.

E, is a horizontal shaft which is fitted to work in bearings in a standard F, erected on top of cylinder A, and occupies a position at a little distance from one side of and below the top of the piston rod. This shaft has at each end an internally screwed eye *d*, into which screws one of two pendulous rods G, G, to the extremities of which are secured equal weights H, H, which are both to be at the same distance from the center of the shaft E, and opposite the piston rod D, said shaft has secured to it a grooved sector I, which may be considered as a more convenient substitute for a pulley and which is connected by a chain *e*, with the head of the piston rod D. The upper portion of the piston rod is slotted for the sector I to work within it, which arrangement permits the rod to get a more direct pull upon the chain and vice versa, than if the latter were connected with one side of it.

L, is the index, which is hung loosely on a pin *f*, which attaches it to one side of one of the weights H, H; the axis of said pin being parallel with the axis of the shaft E, and opposite the center of the weight. This index is weighted in such a manner as to keep it always in an upright position notwithstanding the oscillation of the weight H, to which it is attached.

M, is the dial plate attached by a rigid arm N, to the standard F, and graduated in vertical lines and arranged so that the index moves nearly in contact with its face as the weight H, to which it is attached, oscillates.

The operation of the apparatus is as follows:—When there is no pressure of steam in the boiler the weights H, H, keep the two rods G, G, which are arranged parallel with each other to a vertical position, and the piston is held by the action of the weights on the rods and shaft, below the orifices *b*, *b*, in the cylinder A; but as steam is generated, its pressure acting upon the piston forces the latter upward in the cylinder until the rods G, G, have been moved to such a position by the action of the piston rod and chain upon the sector I, that their weights act upon them with sufficient effect to balance the pressure of the steam, and so long as the said pressure remains uniform the piston and all other parts of the apparatus remain stationary, and the index L, indicates the pressure on the dial. The effectual length of the rods G, G, and the length of the chain *e*, are so adjusted that the rods G, G, arrive at a horizontal position, when the pressure reaches the highest degree desired and that when they arrive at that position the lower edges of the piston pass the lower edges of the orifices *b*, *b*, and permit the escape of steam from the cylinder below the piston through said orifices into the annular chamber *a*, from whence it passes to the escape pipe B.

The index L being attached to one of the weights H, H, opposite to the center thereof

will give the same indication on the dial M, for the same pressure of steam as far as it is capable of moving, whatever may be the distance of the weights from the center of the shaft E, and this enables the weights or the effective length of their rods G, G, to be adjusted to permit the escape of the steam at various pressures. This adjustment is effected by raising the rods G, G, to the horizontal position, that being the position they occupy when the piston is above the lower edges of the escape orifices of the cylinder A; and then screwing the rod G of the weight to which the index is attached through its eye *d*, till the index, hanging in a vertical position on its pin *f*, is opposite the mark on the dial indicating the desired pressure, and afterward adjusting the other rod G to bring its weight to a corresponding distance from the shaft E.

I do not claim the piston safety valve; but

What I claim as my invention and desire to secure by Letters-Patent, is:

The weighted pendulous rods and suspended index L, applied substantially as described in relation with each other and with the dial M, and combined with the piston valve by means of a sector I, chain *e*, and rod D, or their equivalents, to operate substantially as herein set forth.

JAMES H. WINN.

Witnesses:
GEO. B. BURCH,
JOSIAH ARNOLD.