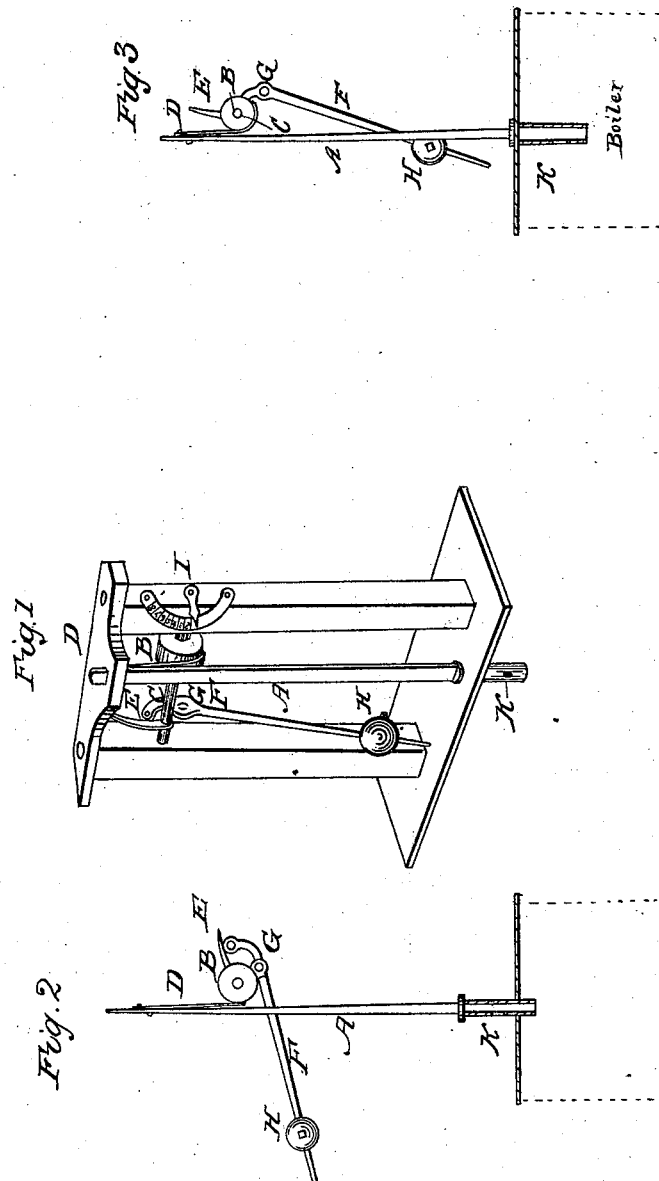


J. HADLEY.  
Pressure Gage.

No. 630.

Patented March 10, 1838.



# UNITED STATES PATENT OFFICE.

JOHN HADLEY, JR., OF BENNINGTON, NEW YORK.

## SAFETY-VALVE FOR REGULATING THE PRESSURE OF STEAM IN STEAM-BOILERS.

Specification of Letters Patent No. 630, dated March 10, 1838.

*To all whom it may concern:*

Be it known that I, JOHN HADLEY, JR., of Bennington, in the county of Genesee and State of New York, have invented a new and  
5 useful steamometer and evacuator for the purpose of showing at all times the degree of pressure of steam in steam-boilers and to give vent to the steam at any degree of pressure desired and to close itself again when  
10 the pressure is sufficiently relieved; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists in a perpendicular rod A, similar to a piston rod,  
15 the lower end passing through the top of any common steam boiler. The upper end is connected with a pulley B (which is on a horizontal shaft C) by a belt or chain D. The shaft lies lengthwise of the furnace.  
20 The pulley is near that end of the shaft next to the mouth of the furnace. Near the other end of shaft C is an arm E projecting from the shaft at right angles, which works on a roller fixed in the short curved end of lever  
25 F which lever is hung on a pivot at G. On the long end is a movable metallic ball H, of discretionary weight fastened by a screw, a hand I is fixed to the pivot on the nether end of the shaft for the purpose of showing  
30 on scale J, the degree of pressure of steam, six or more inches of the lower end of rod A is an open tube, at the upper end of this tube is an orifice through one side of the rod at K for the steam to escape at, one foot or  
35 more above this orifice is a shoulder to prevent the rod from dropping too far into the boiler, above this shoulder the rod is flat and its whole length may be ten feet or at pleasure.

40 The frame that sustains this instrument may be built in any manner that is most convenient. The whole should be proportionate to the size and strength of the boiler. The hand and scale may be placed at any spot  
45 required by the assistance of cog wheels and shafts. The lever F may be fastened into shaft C and work without the assistance of arm E if it be desirable.

When there is no pressure of steam in the boiler, the ball H, hangs directly under the  
50 shaft C, and the curved end of lever F, lies on the arm close to the shaft. As the steam begins to press on the lower end of the rod the rod begins to rise, which causes ball H, to begin its circular motion, as the ball ap-  
55 approaches a horizontal relation to the shaft it forms an increasing resistance against the pressure of the steam; at the same time the short end of lever F being propelled by arm E gradually moves toward the extreme end  
60 of the arm and produces an additional increase of resistance, and when the steam is at the desired degree of pressure the lever F, lies horizontally, the hand I, stands erect and the orifice at K is above the top of the  
65 boiler and the surplus steam escapes, and when sufficiently vented the weight of the ball presses the rod down into the boiler so as to prevent the steam escaping at the orifice, the boiler should be made steam tight  
70 around the rod in the same manner as around a piston rod, the surplus steam to be carried off in a flue.

What I claim as my invention is—

The manner of showing the degree of pres-  
75 sure of steam, and the manner of giving vent to the steam, at the pressure desired in combination as above described.

The design of my invention is to remove the danger of steam boilers bursting and to  
80 relieve the engineer from his intense watchfulness, by placing the hand and scale in full view of the fireman, that he may at all times know how to trim his fire so as to produce the necessary volume of steam, and by  
85 the action of the sliding tubular rod discharging the steam when too abundant, and closing itself again without assistance, when the boiler is sufficiently relieved.

JOHN HADLEY, JR.

Witnesses:

DAVID B. PAGE,  
JAMES PAGE, Sr.