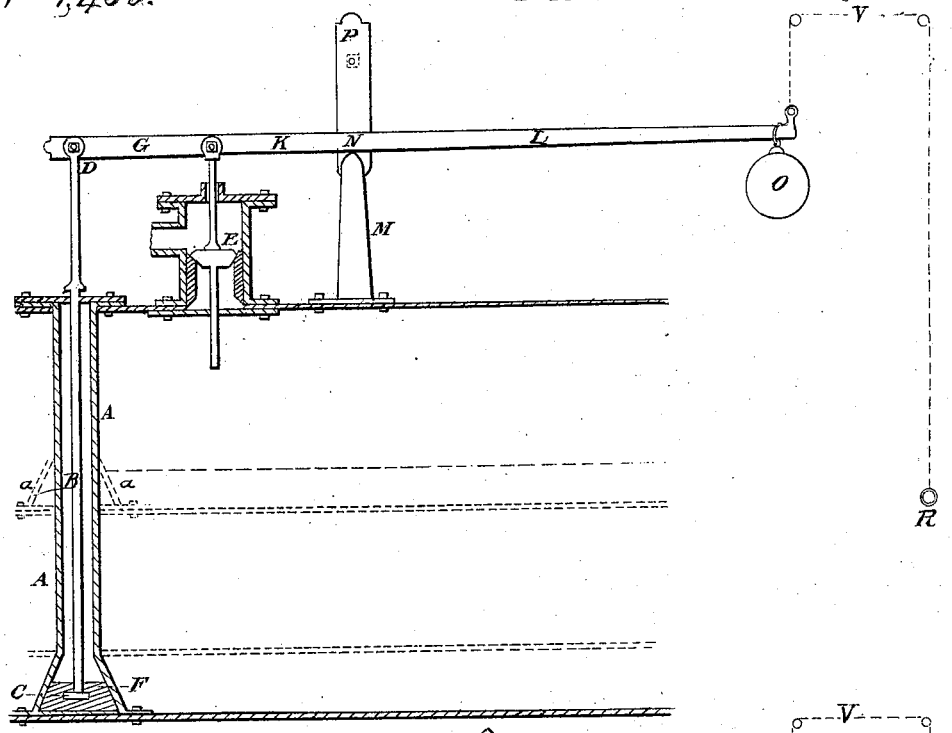
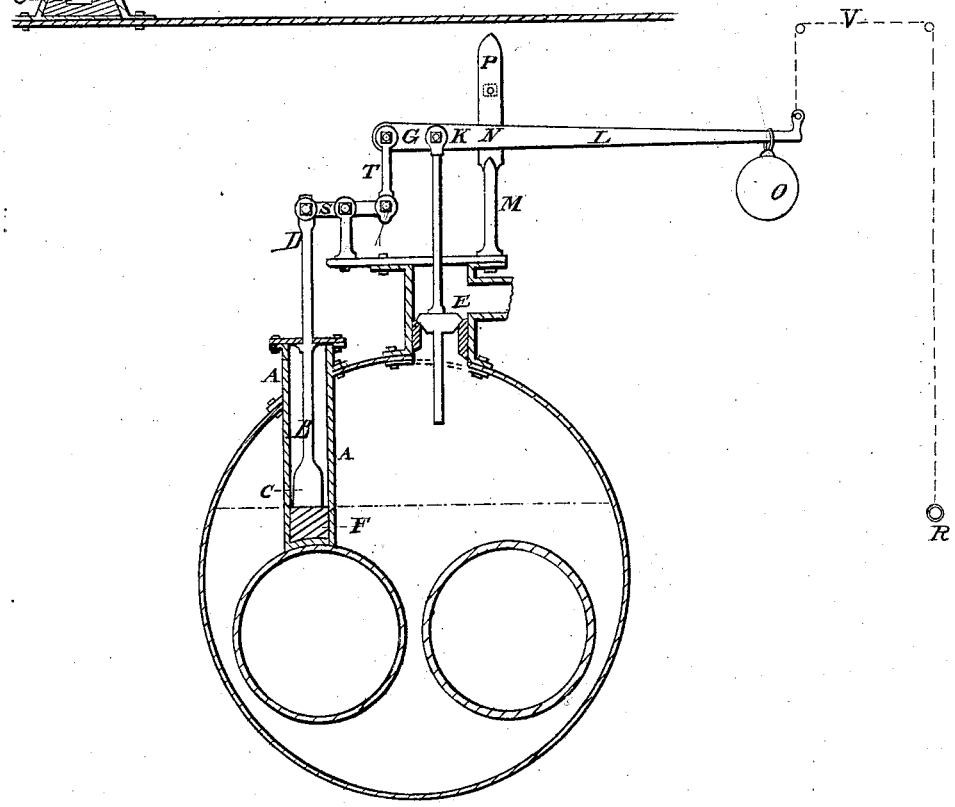
J. P. Bakewell,

Steam Safety Valve.

No. 1,438. Patented Dec 21, 1839.





UNITED STATES PATENT OFFICE.

JOHN P. BAKEWELL, OF PITTSBURGH, PENNSYLVANIA.

SAFETY-VALVE FOR STEAM-ENGINES.

Specification of Letters Patent No. 1,438, dated December 21, 1839.

To all whom it may concern:

Be it known that I, JOHN P. BAKEWELL, of the city of Pittsburgh, county of Allegheny, and Commonwealth of Pennsylvania, have invented and discovered a new and useful Mode of Preventing Steam Boilers or Generators from Bursting or Exploding by Means of a Self-Acting Safety-Valve, and that herein follows a full and complete description thereof.

The nature of my invention (which is best explained by reference to the annexed plan and description thereof, which is intended to be and become a part of these Letters Patent) consists in a mode or method of fastening and securing the standard or upright which is connected with the fulcrum, pivot, or turning point of the beam or lever of a common safety valve (similar to those which have been commonly applied to boilers) in such a manner that the heavier the weight may be which is placed upon the opposite or long arm of the beam for the purpose of keeping the valve closed the more certain and effectual shall be the operation of the apparatus in opening the valve, whenever the boilers or generators shall have been heated to such a degree of temperature as may be considered dangerous or liable to become so.

I do not claim as part of my invention the application of a fusible metallic alloy or the combination of a vertical rod or stem therewith or their further combination with the lever or beam of a safety-valve, as these are not new and are claimed by W. Cadwalader Evans as his invention; but

I do claim as my invention—

1. The mode or manner in which I have arranged the several parts of the apparatus; that is to say, I claim the attachment or connection of a rod or stem (B) to the end of the lever or beam of a safety valve in such a way that it shall be the fulcrum, pivot, or turning point of the beam as long as the alloy remains unfused.

2. And I claim the placing a standard or upright (M) between the safety valve and the weighted end of the lever, to which the beam shall shift its fulcrum or pivot whenever the alloy shall become fused or melted.

All of which is hereinafter set forth in the following specification, and annexed plan or diagram of the apparatus, which exhibits two different modes of the application of the same, viz—

Figure 1 shows one of the modes of applying the "self-acting safety-valve" to a cylindrical boiler, being a vertical longitudinal section thereof. A metallic tube or pipe A, A, (colored red) which is closed at one end, is to be placed within and securely fastened to, the boiler with its closed end downward resting upon the bottom of the boiler, or upon the flue, if constructed with flues, in such a part of the same as to be near to the opening which is made in the same for the purpose of attaching the safety valve seat thereto. A metallic rod or stem B (colored green), which must be constructed with a button or enlargement C at one end, and a pivot hole D at the other, and of such a length that when it is placed within a short distance from the bottom of the pipe A, its upper end D shall be about on a level with the uper end of the stem of the safety-valve E (colored yellow), is to be placed inside the pipe A and a sufficient quantity of the fusible alloy F (colored blue) is to be poured therein, while in a state of fusion; so as to cement or fasten the same securely therein in a vertical position. The pivot end G of the lever or beam G K L of the safety valve E (which may be constructed precisely in the manner which is commonly used) is to be attached to the upper end D of the rod or stem B by a screw bolt and nut as usual. An upright or standard M (colored purple) made of such a length as to be within a short vertical distance from the lower edge of the weighted arm or beam of the lever G K L and having cheeks or guides which loosely clasp the same is to be placed upon and securely attached to the boiler, or the casing of the safety valve, at a short distance from the valve and between it and the weight O. This upright or standard M is intended for the purpose of serving as a second pivot or fulcrum upon which the weighted arm or beam of the lever K L shall bear at N whenever the alloy F shall become fused, which will instantaneously reverse the operation of the weight O so that it shall raise the valve E instead of holding it down. (N. B.—The dotted lines *a a* in this figure show the pipe resting on a flue.)

Fig. 2 shows a different modification of the apparatus applied to a cylindrical boiler with double horizontal flues, being a vertical cross section; the various parts of which with the exception of the lever and coupling

S and T are colored and described as above. The upright or standard M is here attached to the casing of the safety-valve; and the rod or stem B is supported by the fusible alloy instead of its being held down by the same; and is connected with the pivot end of the lever or beam G K L by means of a second lever *d* coupling S and T (colored brown).

To replace the apparatus in either of the above-described modes of application it will be requisite that whenever notice is given from the escape of steam, that the boiler has become so hot as to fuse the alloy, that the lever or beam of the safety-valve must be raised by the "lift line" V R until it bears against the pin or bolt P, which is passed through the cheeks or guides of the standard or upright M keeping the valve E raised, replacing the rod or stem B in its original situation while the alloy is fused; and retaining it there until the alloy is sufficiently cooled, either from the escape of the steam and consequent reduction of heat, or from cold water having been poured into the pipe A, to enable it to sustain or retain the rod or stem in its original situation.

JNO. P. BAKEWELL.

Witnesses:

LEWIS PETERSON,

WM. EICHBAUM.