

C. S. WESTLAND.

Magnetic Safety or Relief-Valves.

No. 152,444.

Patented June 23, 1874.

Fig. 1

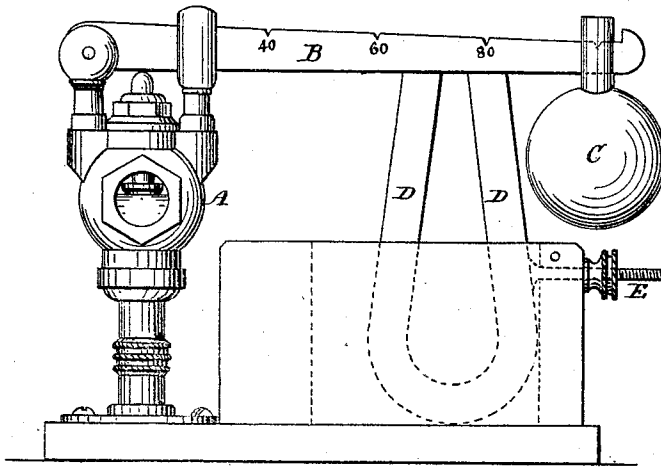


Fig. 2.

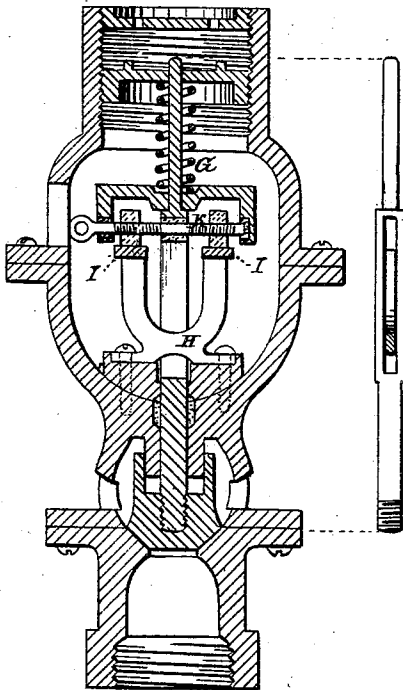
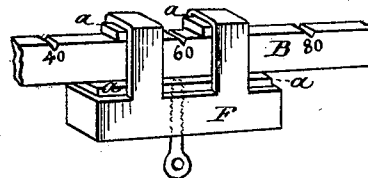


Fig. 3



Witnesses
Philip H. Garner
A. B. Caldwell

Inventor.
Charles S. Westland
By *Wm. M. Wood*
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES S. WESTLAND, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO WILLIAM D. HILTON AND ALANSON WORK, OF SAME PLACE.

IMPROVEMENT IN MAGNETIC SAFETY OR RELIEF VALVES.

Specification forming part of Letters Patent No. **152,444**, dated June 23, 1874; application filed April 27, 1874.

To all whom it may concern :

Be it known that I, CHARLES S. WESTLAND, of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Magnetic Safety or Relief Valve.

My invention relates to and is applicable to that class of valves which are employed in connection with steam-boilers, closed tanks, &c., for the purpose of affording relief from undue pressure therein; and it consists in combining with a valve, which is mainly held to its seat by weights or springs, a magnet, so arranged with relation to the valve that it will at certain times hold the valve to its seat by its own powers of magnetic adhesion, independently of such other means as may be employed, and on which reliance is mainly placed for that purpose, whereby a complete opening of the valve to its fullest relieving capacity can be instantaneously effected; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear and accurate description of my invention, and of valves embodying its essential principles.

Referring to the drawings, Figure 1 represents, in side view, one of my magnetic safety-valves, in which the well-known lever with weight is employed. Fig. 2 represents, in vertical section, one of my magnetic valves in which the well-known controlling spring is employed. Fig. 3 illustrates details in construction relative to insulation.

In Figs. 1 and 2, A denotes the valve proper. Any of the well-known forms of valve may be employed in this connection, to which a vertical spindle may be attached in such a manner as to properly engage with the lever B and be controlled by it and the weight C. D denotes a magnet, preferably of the horse-shoe form. It is arranged to engage magnetically with the under side of the lever, between the fulcrum and its weight, and may be permanently set or fixed at such distance from the fulcrum as will permit it to exercise a holding power with relation to the valve-spindle to any predetermined desired degree; or, as

is preferable, the magnet will be rendered adjustable by means of the adjusting screw-rod E, whereby it may be moved toward or from the fulcrum of the lever. In order to render the power of the magnet as permanent as possible, I prefer to insulate it and the armature, or that portion of the lever with which the magnet engages, as illustrated in Fig. 3. The armature F, is provided with two loops or straps, through which the lever passes, and the intermediate spaces between the upper surface of the armature and the lever, and also between the upper surface of the lever and the straps, will be clad with bone *a*, or other suitable insulating matter. A set-screw through the armature, for compressing the insulating matter against the under side of the lever, may be employed for preventing any undue movement of the armature on the lever.

In Fig. 2, the spring G is employed as the main power for controlling the valve, and is arranged to be adjusted in a manner well known. The valve-spindle is slotted, and the neck of the magnet H passes through this slot, so as to present an arm on each side of the spindle. The pressure-bar, by means of the shoulder on the spindle and the power of the spring, holds the valve to its seat. The under side of the pressure-bar is also provided with an armature, I, preferably insulated for contact with the magnet. In order that the magnetic power may be adjustable, as in the case of the lever-valve, the armature I is made in two pieces, which are mounted on a rod, K, having a right-and-left-hand screw-thread cut thereon, whereby the two sections of the armature may be drawn toward or separated from each other. The polar faces of the magnet are provided with an extensive surface, and in proportion as the armatures engage therewith, with much or little of their faces, so will the holding power exerted by the magnet be increased or lessened. As but little strain can ever be applied to the screw-rod, it is a simple matter to insulate it in order that the magnetic current may be continuously maintained through it and the two sections which it connects, and the magnet affecting insulation

substantially as in the case of the lever-valve. The two sections I, being connected by the screw-rod K, constitute in fact one armature.

The practical operation of both valves may be explained as follows: Either magnet may be so set as to exercise a holding force which will enable the valve to resist pressure of, say, ten pounds to the square inch. The spring or the weight may be so set as to exercise an additional pressure on the valve, of, say, eighty pounds to the square inch. Until the pressure exceeds eighty pounds the magnet exercises no holding function, but commences at that point and holds the valve to the seat until its holding force is overcome, when the valve promptly opens to its fullest capacity and affords prompt relief. It will be seen that my invention is particularly applicable to steam fire-engines, whether employed to obviate excessive pressure of water or of steam, or simply as a valve to afford relief when from any cause the delivery of water from the pumps is cut off or suddenly checked.

I am aware that the method of combining the magnet with the valve may be somewhat

varied, and that the power of the magnet may be regulated or adjusted by various obvious modifications of the mechanism preferably employed by me. I do not therefore limit myself to the mechanical construction or arrangement of the several parts of the apparatus shown and described; but

I claim as new, to be secured by Letters Patent—

1. The combination, substantially as described, of a magnet with a safety-valve which is held to its seat mainly by a spring or by a weight, the magnet operating in conjunction with the weight or spring for the purposes specified.

2. The combination, substantially as described, of an adjustable magnet, with a safety-valve, whereby the magnet may be made to exercise a variable degree of force in holding the valve to its seat, substantially as described.

CHARLES S. WESTLAND.

Witnesses:

F. T. THURSTON,
FRED N. MAXON.