

Hopkins & Straight,

Indicator.

No. 106,820.

Patented Aug. 30, 1870.

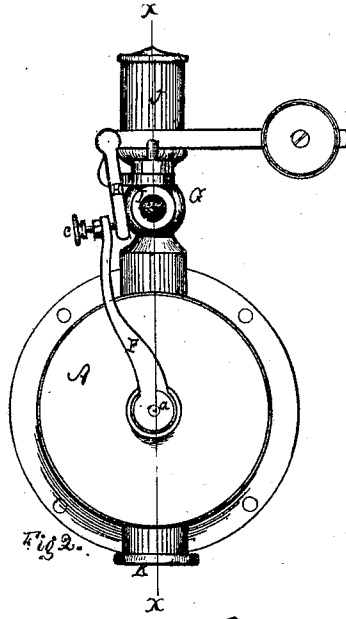
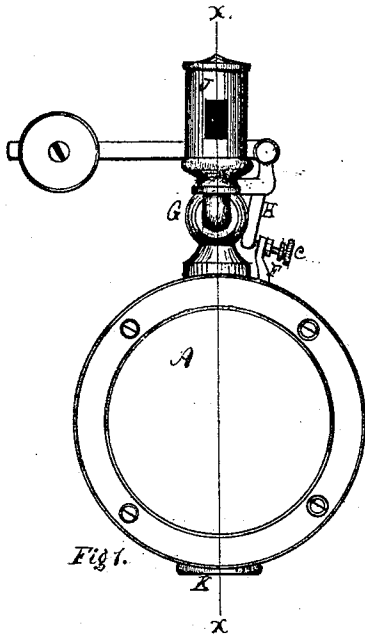


Fig. 1.

Fig. 2.

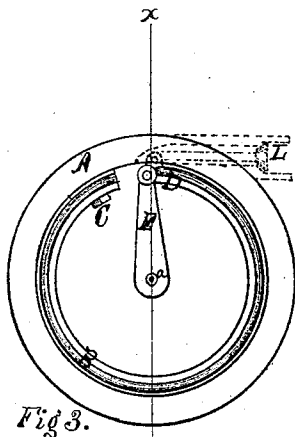


Fig. 3.

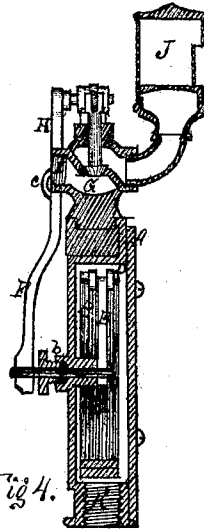


Fig. 4.

Witnesses:
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GEORGE M. HOPKINS AND JOHN A. STRAIGHT, OF ALBION, NEW YORK.

Letters Patent No. 106,820, dated August 30, 1870; antedated August 26, 1870.

LOW-WATER INDICATOR.

The Schedule referred to in these Letters Patent and making part of the same

We, GEORGE M. HOPKINS and JOHN A. STRAIGHT, of Albion, in the county of Orleans and State of New York, have invented a certain Improvement in Low-water Indicators for steam-generators, of which the following is a specification.

Nature and Object of the Invention.

Our invention relates to placing on a pipe which is connected with a steam-generator such an arrangement of metals of different expansibility as that, when joined together and heated, the increased expansion of one of the metals over the other shall cause a motion which may be communicated to a valve, such arrangement being so far removed from said generator, but so connected with the water therein that, when the water is sufficiently high, the apparatus will be in contact with water cooler than that in the generator, so as to prevent the expansion of the metals, but when the water in the generator shall fall below a proper height, the steam will enter and come in contact with the metals, causing their expansion.

The second part of our invention relates to the combination of a pressure-alarm with the above device.

The object of this invention is to provide an apparatus which is to be connected with a steam-generator at a given line, which shall alarm whenever the water in the generator passes below said line, and also to give an alarm at a given pressure of steam.

Description of the Accompanying Drawing.

Figure 1 is a front elevation.

Figure 2 is an elevation showing the parts in the rear of fig. 1.

Figure 3 shows the internal construction.

Figure 4 is a vertical section, taken on the line *x x*, drawn through figs. 1, 2, and 3.

General Description.

A is a case, containing compound ring B, of brass and iron, or of other metals of different expansibilities, attached to the case A at C.

The ring B is separated, leaving the end D free to move.

E is a lever, connected with the ring B at D, and is fixed to the shaft *a*.

The shaft *a* passes out through the stuffing-box *b*, and is provided with the lever F.

G is a safety-valve, attached to the case A, having the lever H connected with the valve-lever, and passes down so as to engage with the lever F.

c is a set-screw in the lever F.

I is a passage leading from the safety-valve G to the steam-room of the generator.

J is a whistle, connected with the valve G, so as to take the steam which escapes it.

K is a passage, communicating with the water-space of the generator.

As long as the water in the generator covers the end of the pipe which connects it with the case A, the water in the case will remain comparatively cool. When the water in the generator drops below the end of said pipe, the water passes out of the case A, and the steam enters, heating the compound ring B, and the brass, expanding more than the iron, causing a motion of the free end D, which motion is communicated to the valve through the levers E, F, and H, and the steam is permitted to escape through the whistle J, thereby causing an alarm.

In fig. 3 the dotted lines show the manner of attaching the valve L directly to the compound ring B.

If it is desired, the valve may be retained to its seat by the pressure of steam in lieu of the weighted lever.

Claims.

We claim as our invention—

1. The compound ring B, or its equivalent, when so far removed from a steam-generator, but so constructed with the water therein that, when the water is sufficiently high, the ring shall be in contact with water cooler than the water in the generator; but when the water in the generator shall fall below a proper height the steam will come in contact with the compound ring B, and cause it to expand, for the purpose substantially as described.

2. The combination of the compound ring B, the safety-valve G, and the accompanying devices, substantially as and for the purpose hereinbefore set forth.

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Witnesses:

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