(No Model.)

A. PHILLIPS & W. D. McLAUCHLIN.

LOW WATER ALARM.

No. 489,497. Patented Jan. 10, 1893.

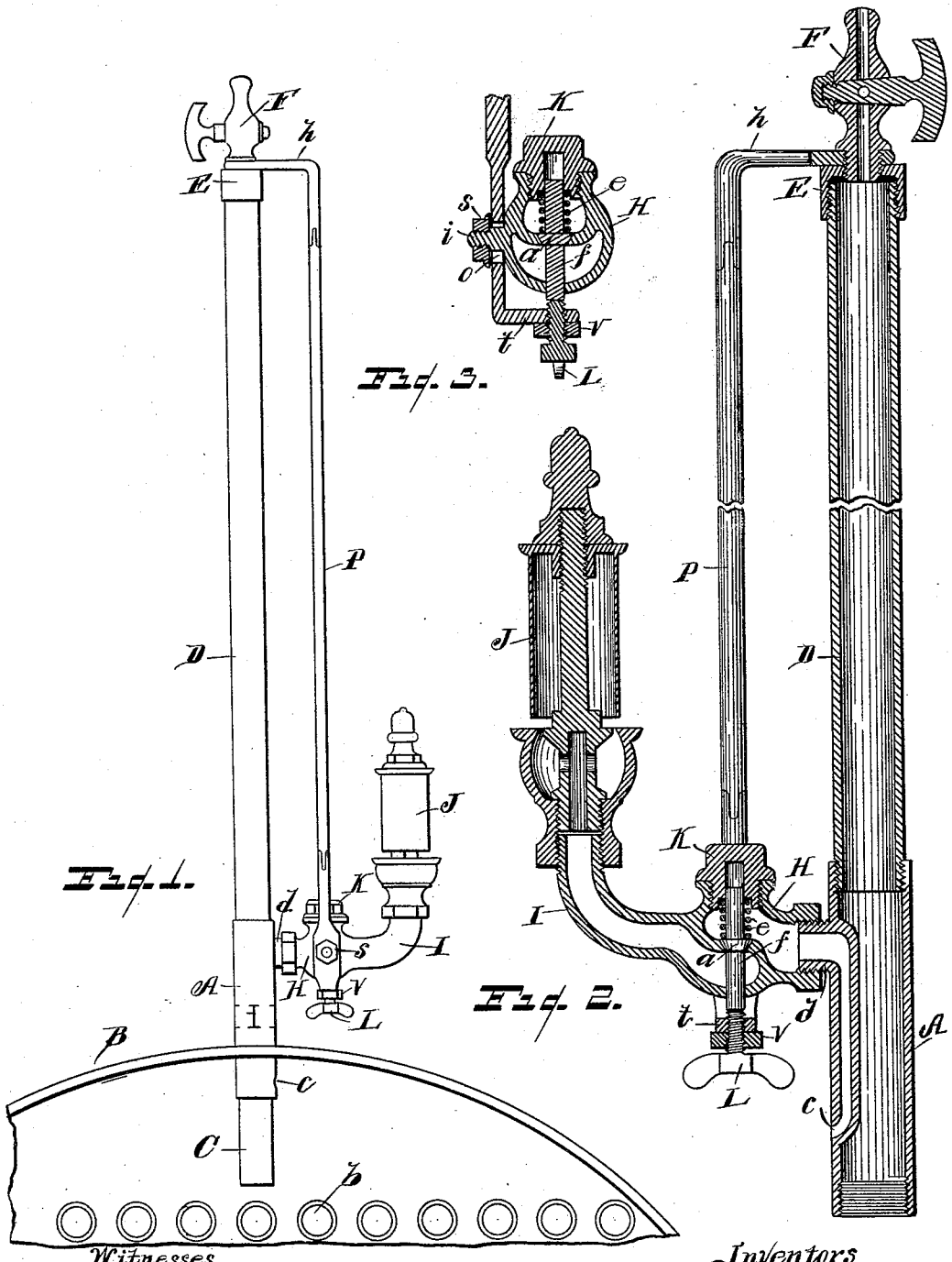

Fig. 1.

Fig. 3.

Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

AUSTIN PHILLIPS AND WILLIAM D. McLAUCHLIN, OF CORUNNA, MICHIGAN.

LOW-WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 489,497, dated January 10, 1893.

Application filed October 8, 1891. Serial No. 408,087. (No model.)

To all whom it may concern:

Be it known that we, AUSTIN PHILLIPS and WILLIAM D. McLAUCHLIN, citizens of the United States, residing at Corunna, in the county of Shiawassee and State of Michigan, have invented certain new and useful Improvements in Low-Water Alarms; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in low-water alarms for boilers and consists in a certain construction and arrangement of parts, as hereinafter fully set forth, the essential features of which being pointed out particularly in the claims.

The object of this invention is to provide a low-water alarm of simple construction, in which the arrangement is such as to render it very sensitive and quick of operations, thereby producing an alarm of great efficiency. This object is attained by the mechanism illustrated in the accompanying drawings in which;—

Figure 1, is an elevation of our improved device attached to a boiler. Fig. 2, is an enlarged vertical section through the expansible tube and the whistle and whistle-valve connected thereto. Fig. 3, is a vertical section through the whistle-valve and case, and the lower end of the operating rod.

Referring to the letters of reference, A, designates a section of pipe that is adapted to be screwed into the plate of the boiler B, as shown in Fig. 1. To the lower end of said pipe section is attached a pipe C, that extends to within three or four inches of the flues *b* of the boiler, so that when a safe quantity of water is in the boiler, the lower end of the pipe C will be covered.

D, designates a tube of brass or other metal of high expansion. The lower end of which is screwed into the upper end of the section A, and the upper end of which is provided with a cap E, having a cock F, therein by means of which the tube may be blown out and cleaned, when desired.

Formed in the side of the pipe section A, and divided from the interior of said pipe, is a stem duct or passage *c*, the lower end of which communicates with the steam space in the boiler, as shown in Fig. 1, and the upper end passes outward through the section A, some distance above the boiler-plate and is surrounded with a threaded boss *d*, on which is screwed the valve-case H, said case having the upwardly curved tube I, upon which is mounted the alarm whistle J. Located in the above case H, is a valve *a*, that is normally held on its seat by a coiled spring *e*, which encircles the valve-stem *f*. The lower end of said spring bears upon the valve, and the upper end against a hollow screw-plug K, in the upper wall of the case, that receives the upper end of the valve stem, and by means of which, the tension of the spring *e*, may be regulated. The lower end of the valve-stem extends through the bottom of the valve-case, for purposes hereinafter set forth.

P, designates the rod that operates the whistle-valve, the major portion of which is composed of wood or other non-expansible material, and is attached at its upper end, by means of the elbow *h*, to the upper end of the expansion-tube D. The lower end of said rod is L-shaped, and the horizontal portion *t*, of which extends under the valve-case H, and carries a thumb-screw L, the upper end of which is adapted to engage the lower end of the valve stem *f*, as shown in Figs. 2 and 3, whereby as said rod is drawn upward, the valve *a*, is raised from its seat. The vertical face of the rod P, at its lower end is flattened and provided with a slot *o*, clearly shown in Fig. 3, that loosely receives the pin *i*, projecting from the side of the valve-case. The outer end of said pin receiving a nut *s* by which means the lower end of said rod is retained in place and is permitted vertical play.

It will now be apparent, that when the water in the boiler has fallen so low as to expose the lower end of the pipe C, the steam will pass up into the tube D, and quickly expand it longitudinally, drawing upward on the rod D, and causing the screw L, to lift the valve-stem and raise the valve *a*, from its seat. When the steam passing through the valve-port, will blow the whistle J, giving notice of the condition of the water in the boiler. It will also be seen, that by reason of the rod P, connecting directly with the valve-stem there

is no lost motion, thereby producing an alarm that will act quickly, and, that, by means of the thumb screw in the lower end of said rod engaging the valve-stem, the parts may be so adjusted, that the valve will be raised by the minimum expansion of the tube D, making a highly sensitive and efficacious alarm.

Upon the screw L, is a set nut *v*, by means of which it may be locked, when properly adjusted.

Having thus fully set forth our invention, what we claim is new and desire to secure by Letters-Patent, is;—

1. In a low-water alarm, the combination of the expansible tube having a steam duct therein and provided with a threaded boss around the upper end of said duct, the valve-case screwed onto said boss, the valve and depending valve-stem, the whistle, the rod attached at its upper end to the expansible tube, its lower end having the integral right-angle portion that extends under the valve-case and engages the lower end of the valve-stem, and means on the valve-case for retaining said rod in engagement with said valve stem.

2. In a low water alarm, the combination of the expansible tube the whistle, the valve-case having a projecting pin, the valve and valve stem located in the case, the lower end of the stem depending through the wall of the case, the rod attached at its upper end to the expansible tube, its lower end being provided with a vertical slot that receives the pin on the valve case, and also having the right-angle portion extending under the valve case upon which the depending end of the valve stem bears.

In testimony whereof we affix our signatures in presence of two witnesses.

AUSTIN PHILLIPS.
WILLIAM D. McLAUCHLIN.

Witnesses:
THOS. AGNEW,
G. D. MASON.