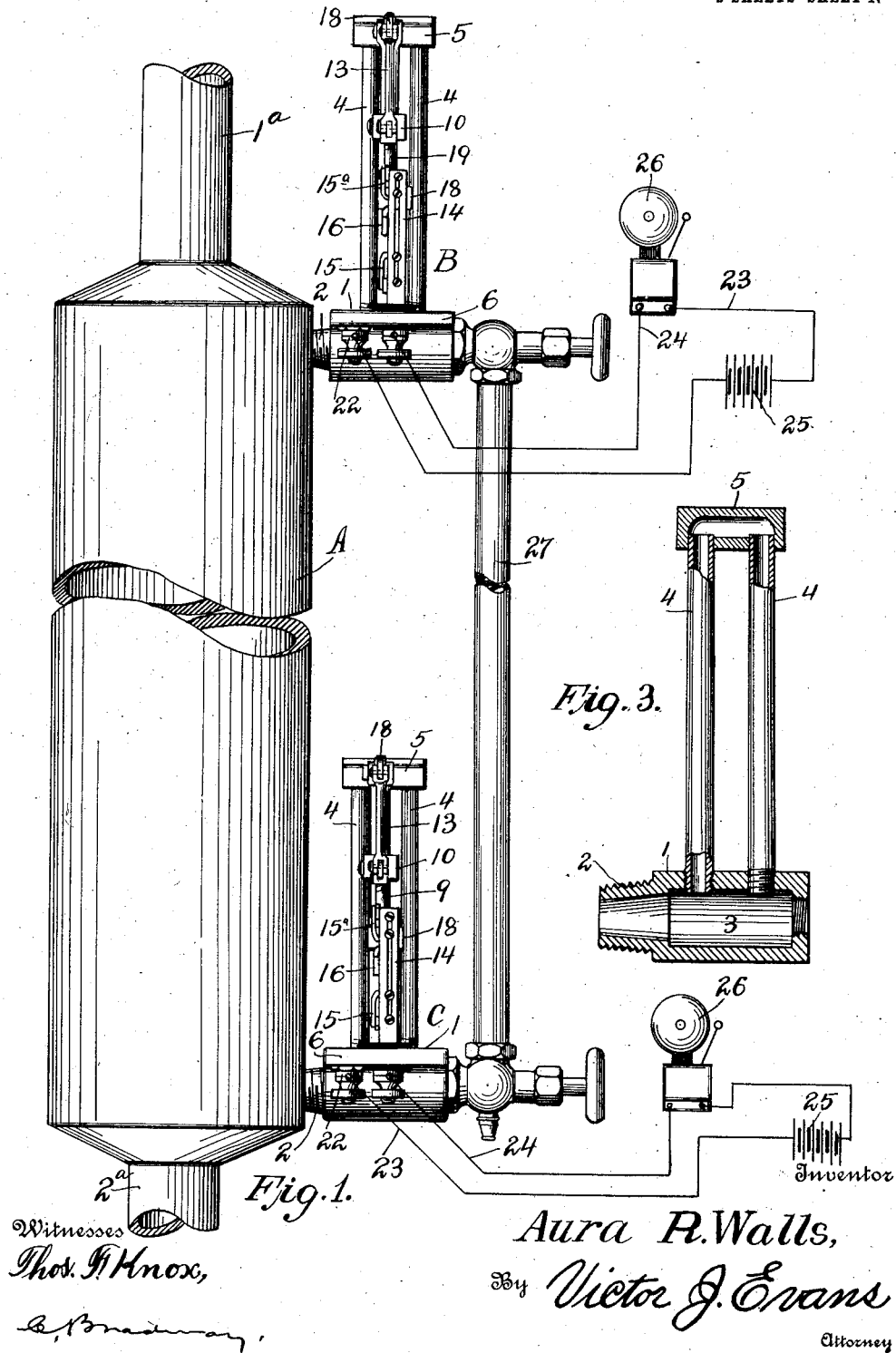


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APPLICATION FILED MAY 11, 1910.

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Patented May 21, 1912.

2 SHEETS-SHEET 1.

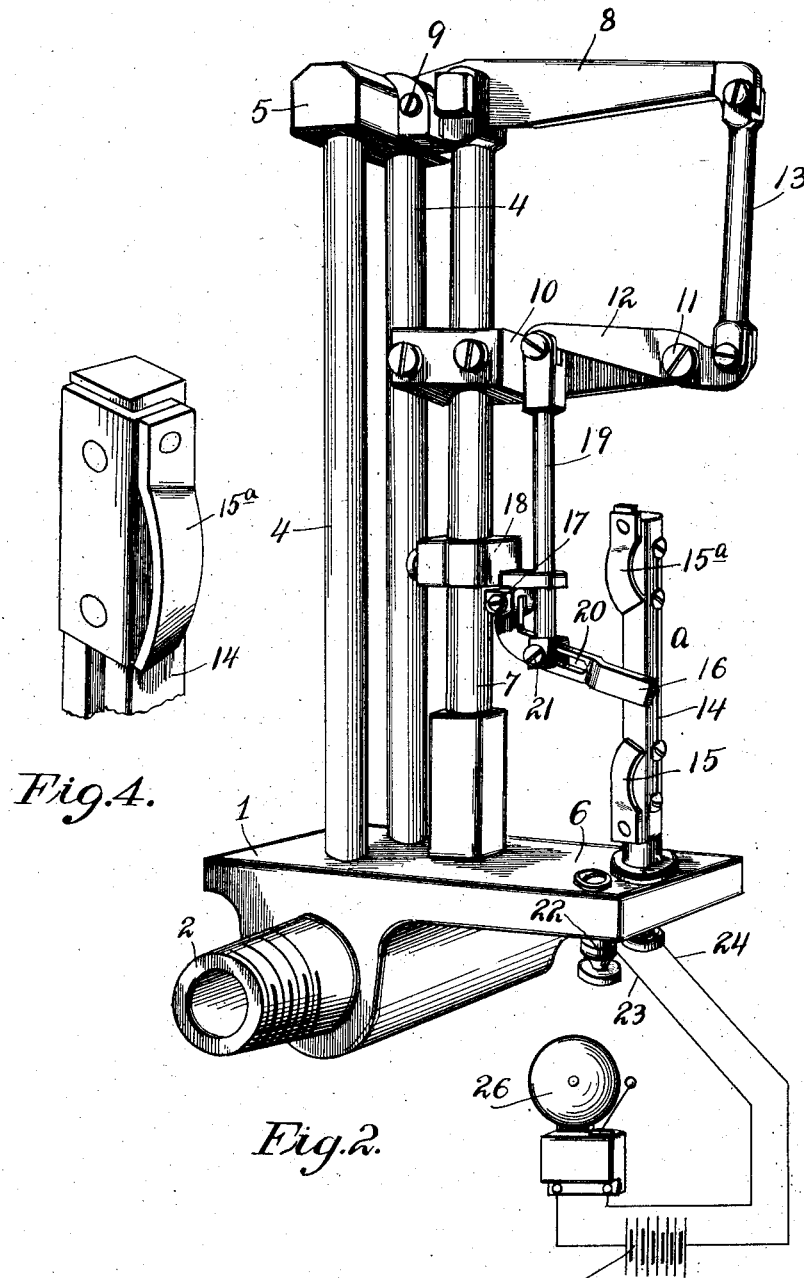


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Witnesses
Thos. H. Knox,
C. Broadway

Inventor
A. R. Walls,
By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

AURA R. WALLS, OF GYPSY, WEST VIRGINIA.

HIGH AND LOW WATER ALARM APPARATUS.

1,027,299.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed May 11, 1910. Serial No. 560,735.

To all whom it may concern:

Be it known that I, AURA R. WALLS, a citizen of the United States, residing at Gypsy, in the county of Harrison and State of West Virginia, have invented new and useful Improvements in High and Low Water Alarm Apparatus, of which the following is a specification.

This invention relates to an alarm apparatus designed for use in connection with steam boilers and the like for sounding a warning when the level reaches a predetermined high or low point.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be comparatively simple and inexpensive to manufacture, reliable and efficient in use, and readily adaptable for boilers already in use.

Another object of the invention is the provision of a novel alarm device including an expansive element, which changes its dimensions with variations in temperature so that the movement thereof can be utilized in opening or closing an alarm circuit.

With these objects in view, and others as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawing, which illustrates one embodiment of the invention:—Figure 1 is a side elevation of the complete low and high water alarm apparatus. Fig. 2 is a perspective view of one of the thermostatic circuit closing devices. Fig. 3 is a vertical section taken through the thermostatic elements of the alarm device. Fig. 4 is a detail view of one of the fixed contacts.

Similar reference characters are employed to designate corresponding parts throughout the several views.

Referring to the drawing, A designates an ordinary water column, which has connections 1^a and 2^a at its ends whereby connection is established with the boiler and at the upper and lower ends of this column are high and low water alarm devices B and C, which cause the alarm to be sounded or energized when the water in the boiler reaches a predetermined high point or a predetermined low point.

Each alarm device is of the thermostatic type and consists, as shown more particularly in Fig. 2, of a hollow base or fitting 1, which has a threaded nipple 2 to screw into the side of the water column A and communicating with the chamber 3 of the body 1 are two upright tubes 4 that have a comparatively high co-efficiency of expansion, and the upper ends of these tubes are connected together by a hollow head or casting 5. On the body 1 is a laterally projecting plate or bracket 6 on which is mounted a vertical supporting rod or standard 7 that has fulcrumed on its upper end a lever 8 which is hingedly connected by the pivot bolt 9 with the head 5 so that as the expandible element, formed by the tubes 4, lengthens and shortens, the lever 8 will swing up and down. On the standard 7 is clamped a bracket 10 on which is fulcrumed at 11 a lever 12 that has one end connected by a link 13 with the outer end of the lever 8. These levers serve to multiply the movement of the expansive or thermostatic element of the device and also to transmit the movement to the movable element of a circuit closer, designated generally by *a*. The circuit closer comprises a metallic standard or post 14 which is fastened in but insulated from the bracket portion 6 of the base 1 and on this post are adjustably fixed contacts 15 and 15^a. Movable between and adapted to engage either contact is a swinging contact 16 that is fulcrumed at 17 on a bracket 18 clamped to the standard 7. This movable contact 16 is connected by a pitman 19 with the inner end of the lever 12, and the lower end of the pitman being adjustably connected with the movable contact. This contact has a longitudinal slot 20 through which passes a pin or bolt 21 on the pitman 19, the slot being necessary to permit the contact to swing as the pitman 19 moves up and down. On the base 1 is a binding post 22 for connecting one side 23 of the electric circuit to the thermostatic alarm device, and the other side 24 of the circuit is connected to the lower end of the contact post 14, which lower end constitutes a binding post. The circuit includes a source of current such as a battery 25 and a bell or other signal 26.

The fittings or bases 1 of the devices B and C can be connected by a tube or gage glass 27.

The upper device B will be so set that

the alarm will be sounded when water rises to such a point to cool the thermostatic element of such device, while the lower device C will be so set that when the thermostatic element thereof is heated by steam, the alarm connected by such device will be energized. When the water in the column A falls below the nipple 2, steam will enter the thermostatic element of the alarm device C and cause such element to expand. As a result the outer end of the lever will swing downwardly and operate through the link 13 to raise the inner end of the lever 12, that in turn operates through the link 19 to raise the movable contact 16 into engagement with the upper fixed contact 15^a. The circuit will now be completed through the wire 23, fitting 1, the metallic parts such as the standard 7, the bracket, levers and links, movable contact 16, fixed contacts 15^a, post 14, wire 24, bell 26 and battery 25. The attendant will thus be warned that the water is dangerously low and that the conditions must be changed. As soon as the water rises in the boiler, the steam will be cut off from the thermostatic element of the lower device C so that the said element can contract and thus move the contact element 16 to open circuit position. In the upper circuit closing device B, the steam is normally contained in the thermostatic tubes 4 and when these tubes are expanded, the contact element 16 is in open circuit position. When the water rises to a point that the steam will be cut off from the tubes 4 of the upper device, such tubes will contract and thereby cause the movable contact element 16 to engage the lower fixed contact 15, thereby completing the signal circuit and warning the attendant that the water level has reached the maximum high point.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the construc-

tion and of the method of operation will be readily apparent to those skilled in the art to which the invention relates, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made when desired as are within the scope of the claim.

What I claim as new and desire to secure by Letters Patent is:—

An apparatus of the class described comprising a base support forming a coupling, a hollow expansible element mechanically connected with the support and communicating with the interior thereof to be subjected to the temperature of the fluid in the coupling, a contact device mounted on the base support for connection with an alarm circuit, means for connecting the support with the alarm circuit, and a structure directly mounted on the support between the said element and contact device for opening and closing the alarm circuit by the expansion and contraction of the said element, said structure comprising a standard fixed at its lower end on the said support, a lever fulcrumed on the upper end of the standard and connected with the said element, an arm mounted on the standard, a lever on the arm, a connection between the said levers, a swinging contact mounted on the standard to engage the contact device for opening and closing the alarm circuit, and a connection between the second-mentioned lever and swinging contact.

In testimony whereof I affix my signature in presence of two witnesses.

AURA R. WALLS.

Witnesses:

J. C. HUNSAKER,
B. L. DUTY.