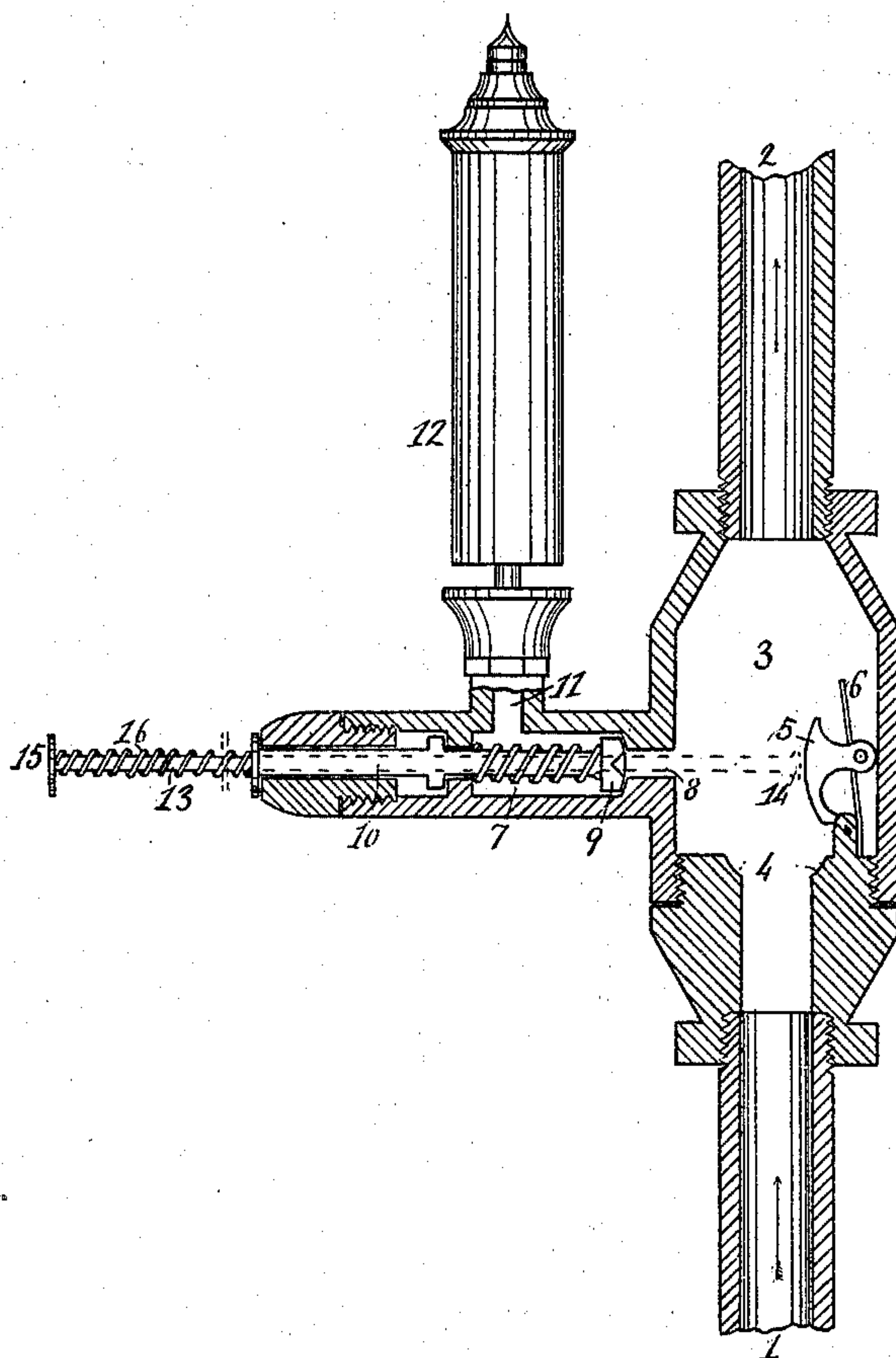


(No Model.)

B. A. WHITE.
FEED WATER ALARM.

No. 540,375.

Patented June 4, 1895.



WITNESSES:

A. B. Howland.

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BYRON A. WHITE, OF ELDRED, ASSIGNOR OF ONE-HALF TO SAMUEL S. BRYAN, OF TITUSVILLE, PENNSYLVANIA.

FEED-WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 540,375, dated June 4, 1895.

Application filed January 28, 1895. Serial No. 536,513. (No model.)

To all whom it may concern:

Be it known that I, BYRON A. WHITE, a citizen of the United States, and a resident of Eldred township, in the county of Warren and State of Pennsylvania, have invented a new and useful Improvement in Feed-Water Alarms, of which the following is a specification.

My invention relates to and is to be used in connection with injectors or inspirators, furnishing water to steam boilers; my object being to insert in the feed water pipe, just below the injector, a device which, while not interrupting the free flow of water when the injector is working right, will, if the injector fails to work properly, sound an alarm to call the attention of the attendant before any harm comes to the boiler from the defect.

It is well known to those operating boilers which are supplied by an injector or inspirator, that occasionally the injector fails to work, owing to scales having collected in the pipe or from some other cause, and the steam instead of lifting the water and passing with it into the boiler, passes the other way, back in the pipe toward the well, thus not only failing to feed the boiler, but heating the pipe into the well; the pipe having to be cooled off before the injector can be made to work. While this is taking place there is no alarm given to call the attention of the attendant, notifying him that the injector is not working right.

By the use of my device, if the injector fails to work, the return steam closes a valve, preventing the steam from passing into the feed water pipe, and opens a side valve giving access to a steam whistle, calling instant attention.

My device is illustrated in the accompanying drawing, in which the water-pipe and my device are shown in section, the alarm-whistle being shown in side view.

1, is the feed water pipe from the well; 2, the pipe to the injector. In this pipe is an enlarged section or elongated hollow ball forming the chamber 3, having at the bottom the valve seat 4, which may be closed by the valve 5. This valve 5, is normally kept open and back against the walls of the chamber by the spring 6, but in the event of a back flow

of water or steam, the back flow will overcome the force of the spring and close the valve. On the side of the hollow chamber 3, opposite to the hinge of the valve 5, is the chamber 7, 55 connected with the chamber 3, by a smaller passage 8. In the chamber 7, is the piston valve 9, having the hollow rod 10, extending through the wall at the rear end of the chamber 7. The valve 9, is seated against the opening 60 8, and is held there by a spiral spring around the hollow rod 10, between the valve and the rear wall of the chamber. From the upper side of the chamber 7, is the opening or pipe 11, connecting direct with the steam whistle 12. 65

In the drawing all the parts are shown in their normal position, as when the injector is working right, the water following the direction indicated by the arrows, the valve 5, open and the valve 9, closed. If the injector 70 fails or ceases to work, the pressure of steam forces back into the chamber 3, the reaction closing the valve 5, and opening the valve 9, admitting the steam to the chamber 7, and to the whistle 12, sounding the alarm. 75

It is sometimes necessary to blow steam back through the water pipe to clean out any scales or dirt that may have collected therein. To enable the engineer to do this, the hollow rod 10, is pierced from end to end and through 80 the valve 9, by a small hole and the spindle 13, is inserted, fitted at the inner extremity with the knob or ball 14, which normally is seated in the valve 9. The spindle 13, extending out beyond the end of the hollow rod 85 10, has on the end the button 15, between which and the end of the piston is the spiral spring 16. This spring holds the spindle back, the ball 14, against the valve 9. If the engineer wishes to blow steam back through the 90 pipe 1, he has only to press in on the button 15, when the spindle 13, is driven through inside the hollow rod and valve and against the open valve 5, (as shown by the dotted lines) holding it open, and also holding the valve 9, 95 closed, when the steam has free access to the pipe 1, without entering the side chamber 7. On releasing the pressure on the button, the spindle 13, returns to its normal position.

In this device as described and shown, in 100 addition to the main design of giving an instant alarm when the injector goes wrong,

two objects are accomplished: First, in the normal condition no obstacle is presented to the free, direct, and unimpeded flow of water. The valve 5, being held well back by the spring 6, does not obstruct in any degree the flow between the pipes 1, and 2. This is a desirable object in the use of injectors. Second, the normal conditions of all parts are right for giving the alarm if the injector fails to work. The engineer cannot reverse these conditions in any other way than by pressure on the button 15, and as soon as the pressure is removed the parts fly back to the normal. There is no danger that the engineer by forgetting to open or to close a valve or stop cock shall disarrange the alarm and render it ineffective.

I am aware that a somewhat similar device has been patented for the same purpose, but for the above reasons, and because my device is cheaper and more certain in use, I claim that I am entitled to Letters Patent.

I claim as my invention—

1. A feed water alarm; consisting of an enlarged section of pipe or an elongated ball, forming a chamber, inserted in the feed water pipe below the injector; a valve seat at the bottom of said chamber adapted to be closed by a valve; the valve hinged thereto but held open and back by a spring against the wall of the chamber when the injector is working properly, but adapted to be closed by the back pressure of steam when the injector fails to work; a side chamber in a pipe projecting from said hollow ball and connected with the chamber in the hollow ball by a passage which is closed by a valve in said side chamber opening inwardly, but normally held closed by a spring inside said side chamber; a passage from said side chamber connecting with a steam whistle: all the parts

hereto working in combination, allowing a free and unobstructed flow of the water through the feed pipe into the boiler when the injector works properly, but giving an instant alarm if it does not; substantially as shown and described.

2. In a feed water alarm; the spindle 13, passing through the valve 9, and hollow rod 10, and extending beyond the end of the hollow rod, in combination with the spring 16, and adapted to be pressed inward to hold the valve 5, open; substantially as shown and for the purpose herein set forth.

3. As a new article of manufacture; a feed water alarm, consisting of an enlarged section of pipe or elongated hollow ball forming the chamber 3, said chamber having at the bottom the valve seat 4, adapted to be closed by the valve 5; the valve 5, hinged to said valve seat but normally held open and against the wall of the chamber by the spring 6, but yielding to back pressure and closing upon the valve seat when the injector fails to work; the side pipe projecting from said enlarged section or hollow ball forming the side chamber 7, which is connected with the chamber 3, by the steam passage 8, said passage being normally closed by the inwardly opening valve 9 in said side chamber; the rod 10, and spring 7, operating to keep the valve closed; the steam passage 11 from the side chamber leading to the steam whistle 12; and the steam whistle 12; all operating in combination and adapted to be placed in the feed water pipe of a boiler below the injector; substantially as shown and for the purpose herein set forth.

BYRON A. WHITE.

Witnesses:

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F. B. HOWLAND.