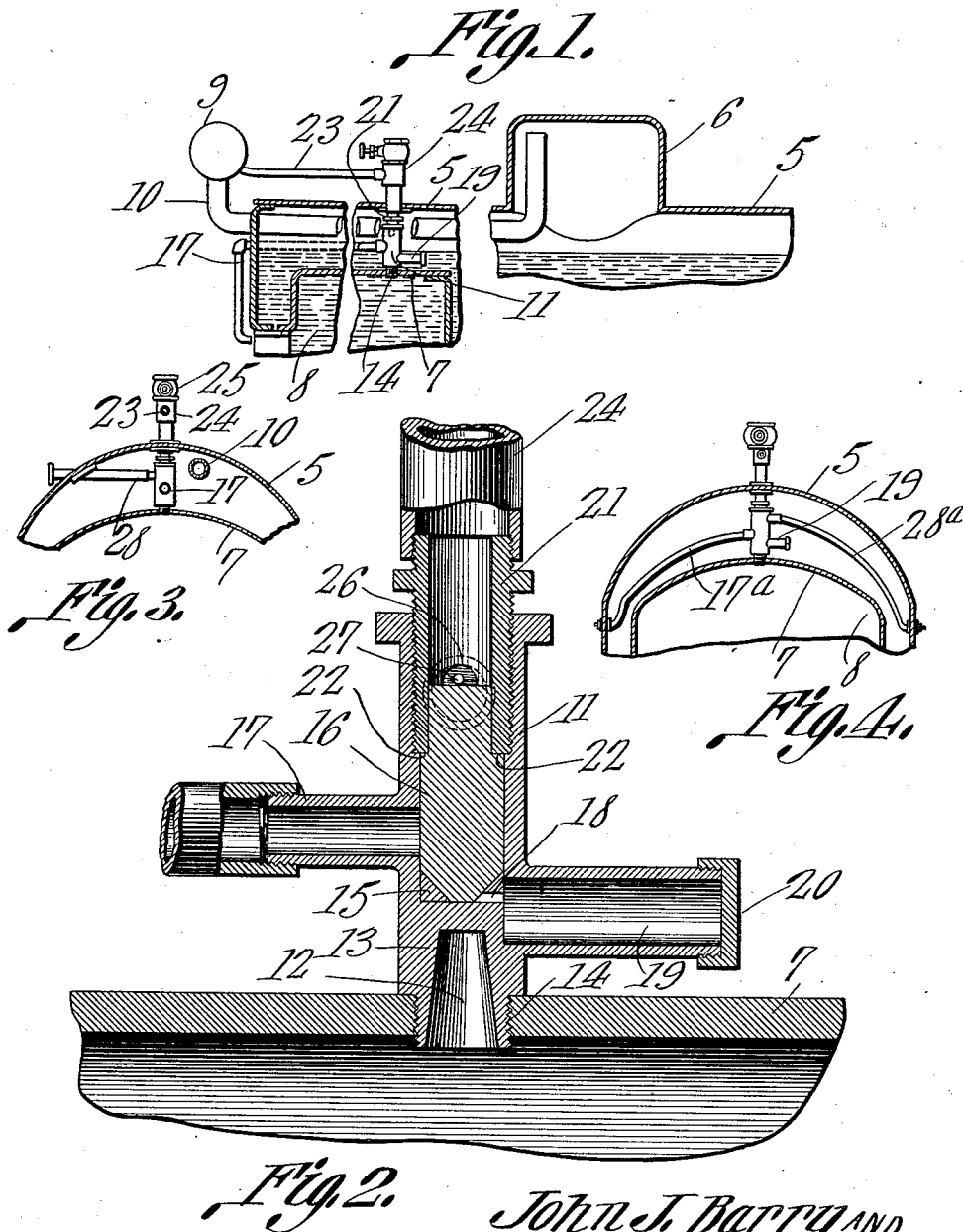


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SAFETY DEVICE FOR STEAM BOILERS.
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1,007,175.

Patented Oct. 31, 1911.



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UNITED STATES PATENT OFFICE.

JOHN J. BARRY AND FRANCIS L. STREET, OF NEODESHA, KANSAS.

SAFETY DEVICE FOR STEAM-BOILERS.

1,007,175.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOHN J. BARRY and FRANCIS L. STREET, citizens of the United States, residing at Neodesha, in the county of Wilson, State of Kansas, have invented a new and useful Safety Device for Steam-Boilers, of which the following is a specification.

It is the object of the present invention to provide an improved safety device for locomotive and other steam boilers and the invention relates more particularly to that class of safety devices designed to prevent bursting of the boiler when the water level therein is abnormally low.

It is one aim of the present invention to overcome the disadvantages of devices of this class now in use, such devices being now so constructed as to become readily clogged with sediment or scale and liable not to perform their proper function when the water level in the boiler becomes abnormally low. Such devices, usually, embody a fusible plug but are so constructed that sediment and scale may form and become incrustated upon the plug and completely close the passage in which the plug is positioned, so that while, when the water level in the boiler becomes abnormally low, the plug may fuse, the passage in which it is positioned, will not be opened inasmuch as the sediment and scale caked in the passage is not affected by the heat.

It is the aim of the present invention, therefore, to so construct the device that the passage in which the plug is positioned will be kept free from sediment and scale.

A further aim of the present invention is to so construct the device that the fusing of the plug will serve to open the passage in which the plug is positioned and allow steam to flow from the boiler, through a pipe discharging into the fire box. Thus, means is provided for automatically extinguishing the fire in the fire box when the water level in the boiler becomes abnormally low.

With the above and other objects in view, the invention resides in the general construction and arrangement of parts substantially as set forth in the appended claims and illustrated in the accompanying drawings, in which,

Figure 1 is a vertical longitudinally sectional view through a portion of a locomotive boiler illustrating the arrangement of

the invention therein. Fig. 2 is a detail vertical sectional view through the device. Fig. 3 is a vertical transverse sectional view through the portion of the boiler and fire box shown in Fig. 1 of the drawings. Fig. 4 is a view similar to Fig. 3 illustrating a slight modification in the arrangement of parts of the device.

In the drawings, the numeral 5 indicates the boiler shell and 6 the usual steam dome at the top thereof.

The numeral 7 indicates the crown sheet of the fire box 8 and the numeral 9 designates the usual fountain which is supplied with steam by a pipe 10 leading thereto from the steam dome 6.

The safety device embodying the present invention includes a casing 11 having its lower end reamed out as at 12 to afford a comparatively thin bottom wall 13 at the lower end of the casing. The said lower end of the casing is exteriorly threaded as at 14 and is fitted in an opening formed in the crown sheet 7 of the fire box. Within the casing 11 upon the bottom wall 13 thereof, there is formed a seat 15 upon which fits the lower end of a fusible plug 16. The body of this plug is of the same diameter as the interior of the casing and fits snugly there-within. A steam discharge pipe 17 leads rearwardly from the casing 11, through the rear head of the boiler shell, and terminates at the door of the fire box, its end being presented forwardly so that steam passing through the pipe will be discharged directly into the fire box. This pipe 17 is however normally closed, at its end which connects with the casing 11, by the fusible plug 16. The seat 15 within the casing is formed with a small opening 18 which opens into a chamber 19 projecting from the casing 11 and closed by a cap 20. Normally, the water within the boiler 5 covers the casing 11 or at least that portion thereof in which the plug 16 is fitted but, should the water level fall to such degree as to expose the casing directly to the heat of the fire box, the plug 16 will be fused and will flow through the opening 18 into the chamber 19 provided for its reception.

A tubular bushing 21 is threaded into the upper end of the casing and at its lower end bears upon a shoulder 22 formed upon the plug 16 by reducing its upper end. A steam supply pipe 23 leads from the fountain 9

to a pipe 24 threaded at its lower end to the upper end of the bushing 21. This pipe 24 is provided at its upper end with a valve 25.

As heretofore stated, it is one aim of the present invention to provide means for preventing the accumulation of sediment and scale upon the plug, and with this end in view, the bushing 21 is formed with an opening 26 in registration with a small opening 27 formed through the wall of the casing 11. The opening 27 is located at a point coincident with or immediately above the upper end of the plug 16 and leading from the casing is a vent pipe 28 between which and the interior of the casing the opening 27 establishes communication. This vent pipe 28 leads through the boiler shell 5 and owing to this fact it is preferably extended laterally from the casing. It will be observed from an inspection of Fig. 3 of the drawing that this vent pipe is straight throughout its entire length so that a wire or other suitable implement may be inserted therein for the purpose of removing any sediment or scale which might in time accumulate therein.

It will be observed that the steam discharge pipe 17 leads rearwardly from the casing 11, through the rear head of the boiler shell, and downwardly and into the fire box 5.

The operation of the device is as follows: The device is normally covered or partly covered by the water in the boiler 5. However, should the water level in the boiler become abnormally low, and the crown sheet 7 heated to an abnormal degree, the plug 16 will be fused and will flow through the opening 18 and into the chamber 19. When this occurs, steam is allowed to flow from the steam supply pipe through the casing 11 and out through the discharge pipe 17 by which pipe it is directed into the fire box and extinguishes the fire therein, thus avoiding the bursting of the boiler. Under normal conditions, the steam entering the casing by way of the supply pipe 23, will escape, very slowly, however, through the vent opening and through the vent pipe 28. Inasmuch as this vent opening 27 is located at a point immediately above the upper end of the plug 16, the jet of steam issuing through the opening will serve to draw into the opening and through the pipe 28, any sediment or scale which would otherwise collect upon the upper end of the plug 16. It will be understood of course that the pipe 28 is at all times open to the atmosphere. It will be further understood at this point that inasmuch as the pipe 28 is straight and opens through the boiler shell, a wire may be inserted through the pipe and the opening 27 and into the casing 11 at a point immediately above the plug 16 for the purpose of removing accumulations from the

pipe 28 or for breaking up any crust or scale which may have formed or accumulated upon the upper end of the plug 16, during a period of disuse. Furthermore, by opening the valve 25, a wire or like cleaning implement may be inserted down through the pipe 24 for the same purpose.

In Fig. 4, of the drawing, the numeral 28^a indicates a vent pipe corresponding to the pipe 28 shown in Fig. 3 of the drawings, and this pipe opens through the boiler shell at one side thereof. Also, in the said Fig. 4, the numeral 17^a indicates a pipe corresponding to the pipe 17 shown in Figs. 1 and 2 of the drawings, but, this pipe, instead of discharging into the fire box of the boiler, extends laterally from the casing 11 and opens through the boiler shell at that side opposite the side through which the pipe 28^a opens.

What is claimed is:

1. In a device of the class described, a casing, a steam supply pipe opening into the casing, a steam discharge pipe leading from the casing, a fusible plug fitted in the casing and closing communication between the steam supply and discharge pipes, a seat within the casing for the plug, and a chamber upon the casing for receiving the fused plug, the seat for the plug being formed with an opening in communication with the chamber.

2. In a device of the class described, a casing, a steam supply pipe opening into the casing, a steam discharge pipe leading from the casing, a fusible plug fitted in the casing and closing communication between the steam supply and discharge pipes, and a vent pipe leading from the casing at a point immediately above the upper end of the plug.

3. In a device of the class described, a casing, a steam supply pipe opening into the casing, a steam discharge pipe leading from the casing, a fusible plug fitted in the casing and closing communication between the steam supply and discharge pipes, and a straight vent pipe leading from the casing at a point immediately above the upper end of the fusible plug.

4. In a device of the class described, a casing, a steam discharge pipe leading from the casing, a plug fitted in the casing and closing the said steam discharge pipe, a bushing threaded into the casing and bearing upon the plug, a steam supply pipe connected to the bushing, and a vent pipe leading from the casing in a plane with the upper end of the plug.

5. In a device of the class described, a casing, a steam supply pipe opening into the casing, a steam discharge pipe leading from the casing, a fusible plug fitted in the casing and closing communication between the steam supply and discharge pipes, and

means for exhausting steam from the casing at a point directly above the upper end of the said fusible plug.

5 6. In a device of the class described, the combination with a boiler and its fire box, of a casing fitted upon the wall of the fire box, a steam supply pipe leading from the boiler to the casing, a steam discharge pipe leading from the casing and into the fire
10 box, a fusible plug fitted in the casing and closing communication between the steam supply and discharge pipes.

7. In a device of the class described, a casing, a steam discharge pipe leading from
15 the casing, a fusible plug fitted in the casing and closing the said steam discharge pipe, a

steam supply pipe leading into the casing, above the plug, a vent pipe leading from the casing in a plane with the upper end of the plug, and a chamber upon the casing for
20 receiving the fused plug, the chamber being in communication with the casing at the lower end of the plug.

In testimony that we claim the foregoing as our own, we have hereto affixed our sig-
25 natures in the presence of two witnesses.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."