

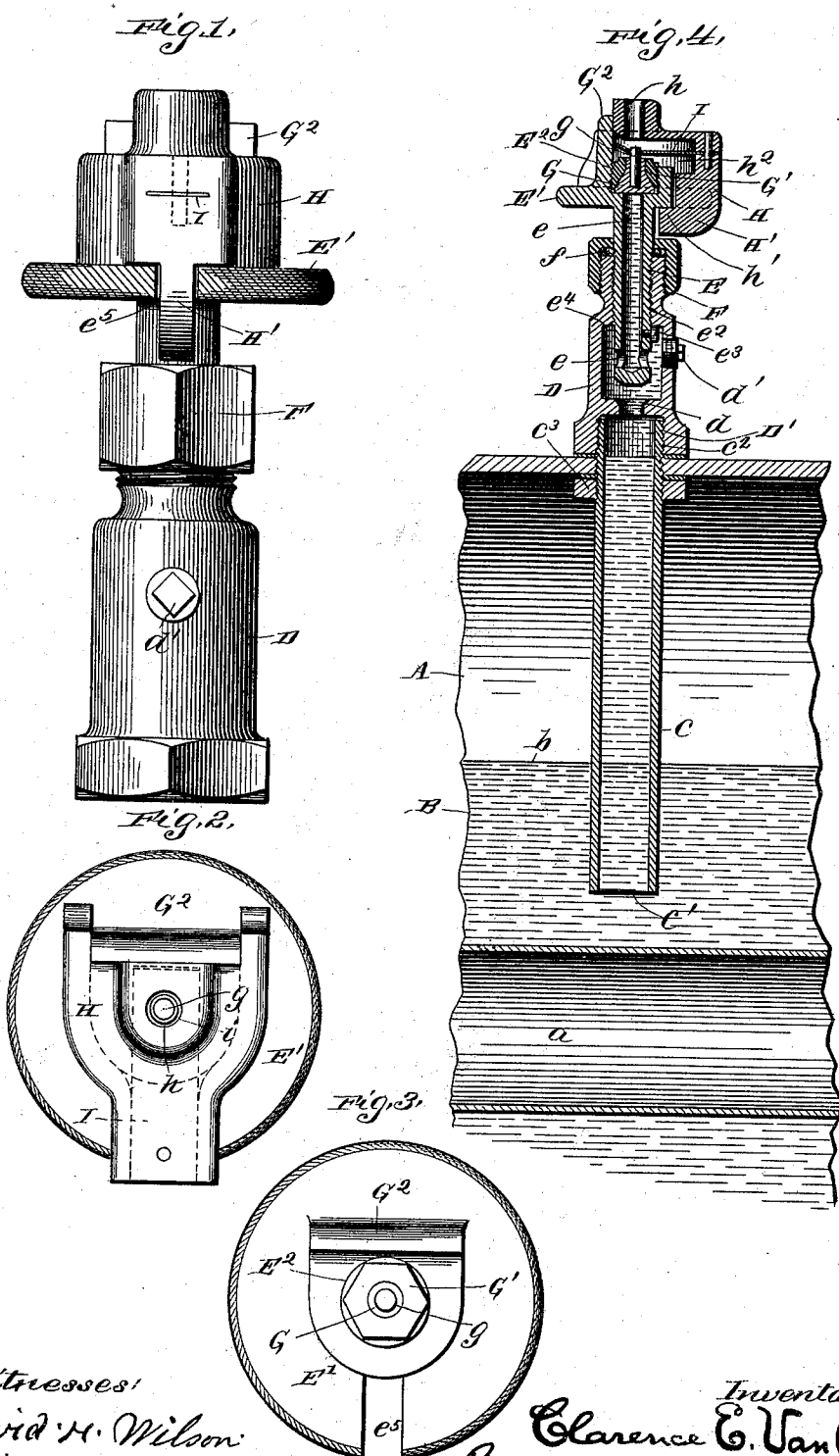
(No Model.)

2 Sheets—Sheet 1.

C. E. VAN AUKEN.
SAFETY PLUG FOR BOILERS.

No. 504,896.

Patented Sept. 12, 1893.



Witnesses:
David H. Wilson
Katie A. Hargaden.

Inventor:
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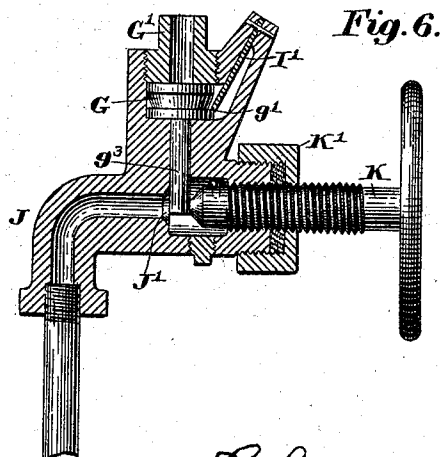
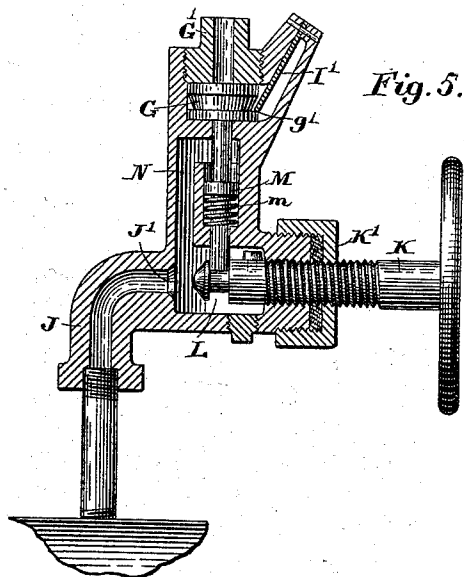
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2 Sheets—Sheet 2.

C. E. VAN AUKEN.
SAFETY PLUG FOR BOILERS.

No. 504,896.

Patented Sept. 12, 1893.



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David H. Wilson.

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UNITED STATES PATENT OFFICE.

CLARENCE E. VAN AUKEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHARLES P. MONASH.

SAFETY-PLUG FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 504,896, dated September 12, 1893.

Application filed February 29, 1892. Serial No. 423,312. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. VAN AUKEN, residing at Chicago, in the county of Cook and State of Illinois, have invented certain
5 new and useful Improvements in Safety-Plugs for Boilers, of which the following, in connection with the drawings accompanying and forming a part hereof, is a full and complete description, sufficient to enable those skilled
10 in the art to understand and use the same.

My invention relates to that class of safety plugs which are placed on boilers in such manner that when the water in the boiler has fallen below a determined level, steam will
15 escape from the boiler through the safety plug, and thereby give warning of low water in the boiler. This device is ordinarily called a low water alarm.

The objects of my invention are to obtain
20 a safety plug wherein, when water in the boiler has fallen below a determined level, warnings shall be given in the usual manner by the escape of steam therefrom; to obtain a device, which when properly set cannot readily
25 be changed or tampered with by any person; to obtain a device which cannot be by an ordinarily intelligent person wrongfully or improperly set; to obtain a device, which shall by its appearance indicate in a manner readily
30 observable whether or not the same is properly set for the escape of steam there-through upon the falling of the water in the boiler below the determined level; and to obtain a device which shall not be readily gotten
35 out of order, and when gotten out of order, its condition will be indicated in an easily observable manner to those skilled in the use thereof.

In safety plugs of this class a fusible plug is employed, such fusible plug being of metal not fused by hot water but fusible by steam at a given and determined temperature; and I attain these several objects by constructing a device wherein the fusible plug used in connection therewith is locked in position when
40 inserted in its proper place in the casing of the device, so that it cannot be removed therefrom except by the fusing thereof, and by placing a valve in the casing between the fusible plug and the boiler, with a stop adapted
50 to be brought against the valve stem so as to

prevent the closing of the valve, such stop being so brought into position to prevent the closing of the valve by the proper placing of the fusible plug in the casing.

As is hereinafter shown by one of the figures of the drawings the fusible plug may itself be interposed as a stop to prevent the closing of the valve, but such fusible plug being ordinarily of a metal not sufficiently
60 hard to form a perfect stop, I prefer and do construct my device with a stop of material other than the fusible plug material.

I have illustrated my invention by the drawings accompanying and forming a part hereof
65 in which—

Figure 1, is a front elevation of the safety plug embodying my invention; Fig. 2, a top plan view thereof; Fig. 3, a top plan view with a portion of the casing removed therefrom; Fig. 4, a vertical sectional view of the device and of a portion of a boiler to which the same is attached, and showing the manner of attachment. Fig. 5, is a vertical sectional view of a modification of the construction illustrated in Figs. 1 to 4, both inclusive,
75 embodying my invention; and Fig. 6, a modification of the constructions illustrated in Fig. 5; embodying nearly all of the essential features of my invention.

The same letter of reference is used to indicate a given part where more than one view thereof is shown in the several figures of the drawings.

A, is the shell of the boiler, a portion of
85 which is illustrated.

B, is water contained in the boiler; *b*, the water line thereof.

C, is a tube extending from the shell of the boiler, in which shell it is secured, downward
90 to a determined level of the water at or about which, an alarm is to be given by the device. C', is the lower end of such tube or flue C.

C², C³, are screw threads on tube or flue C.

D, is the principal shell or casing of the device, and the device is at times attached to a boiler by extending the tube C through the shell of the boiler and turning threads D' in the shell or case D downward upon the screw threads of the tube C, a sufficient distance to
100 hold such shell or case A firmly thereon. The tube C may extend outward from the boiler

so that the shell D forming the principal portion of the casing shall not be in contact with the shell of the boiler, if desired, and ordinarily such tube C does so extend, but in any event such tube C forms no part of my invention.

The shell or case D is hollow, and d , is a valve seat therein against which valve seat the lower end of the plug E may be forced, when the safety plug is not to be used as a safety plug, for instance, to stop the escape of steam after warning has been given, by the doing of certain things hereinafter explained. Plug E has passage-way e extending from near the lower end thereof the remainder of the distance through it and at the lower end extending out from such passage-way is the opening e' .

e^2 , is a screw thread on the outside of plug E, fitting into corresponding screw threads in the shell or casing D and it is by turning the plug E that, by means of the screw threads e^2 , such plug is forced downward upon the valve-seat d as hereinbefore stated.

e^3 , is a screw fitting into plug E. Screw e^3 coming against the shoulder e^4 in the shell or casing D renders it impossible to remove the plug E from the shell or casing.

F, is a stuffing box; and f , is the stuffing by means of which the escape of steam or water from the joint formed by the insertion of the plug E in shell or case D is prevented.

At the upper end of the plug E there is secured on such plug, or forming an integral part thereof, the milled wheel E' . e^5 , is a slot in such milled wheel E' , and E^2 , is a receptacle at the upper end thereof into which may be placed the fusible plug G, such fusible plug being held in position by the nut G' . In the fusible plug G there is placed the pin g . Pin g may form an integral part of the fusible plug G and has been so constructed by me.

G^2 , is a projecting lug extending beyond the upper face of the milled wheel E' .

H, is a portion of the casing of the device removable therefrom when no fusible plug is contained in the device, but not removable therefrom when a fusible plug is in place in such device.

The portion or part H of the shell or casing of the device has therein, hole or passage-way h , which fits upon the upper face of the milled wheel E' . Projection H' extends through the slot e^5 in milled wheel E' and has thereon abutment h' extending underneath such milled wheel. The abutment h' is sufficiently large, in the dimension thereof parallel with the axis of the plug E, that when such part H of the casing is slid into position on the milled wheel E' such plug E cannot be turned down (by means of the screw threads thereon), so as to close the valve formed by the lower end of such plug E fitting on valve seat d ; and hence when the part H is in position as illustrated in Fig. 4, an open passage-way would extend through the shell or casing D, plug E

and part H, (by means of hole or passage-way h), were it not for the fusible plug G, and so when water falls below the bottom of the tube or flue C in the boiler, steam entering the tube or flue C can and will extend to the plug G, and such plug G being composed of fusible metal, it will be fused thereby and the steam will then escape through the plug.

In order to prevent the removal of the part H from the position in which it is illustrated in Figs. 1, 2 and 4, the spring I is secured to the under side thereof, in the chamber h^2 in such part H, and in the spring I there is the hole i into which the pin G in the fusible plug extends. By means of this spring I, when the fusible plug G is in proper position and the part H is slid over it, the pin g will engage with the spring I, and the part H will be thereby held in place. When in place, as hereinbefore stated, the valve formed by the lower end of the plug E fitting on the valve d , cannot be closed. When, however, the fusible plug G, has been removed by melting or fusing, the part H can be slid off the milled wheel E and the valve closed; and this should be done by the person in charge to prevent the continuous escape of steam from the safety plug after warning has been given by the device. When the valve formed by the lower end of the plug E, fitting into the valve-seat d has been closed as last above described, the part H having been previously removed, the nut G' can be removed and a new plug G, fitted into proper position in the opening therefor, E^2 , the plug E again raised, and the part H inserted in position. The device is then again ready for operation.

In the modification illustrated in Fig. 5, the casing is composed of a single shell having therein a valve and a receptacle in which the fusible plug may be inserted and the part H of such shell or casing contained in the construction illustrated in Figs. 1 to 4, all inclusive, is omitted.

In the construction illustrated in Fig. 5, J, is the shell or casing; J' , is the valve-seat therein. K, is a valve adapted to fit on valve-seat J' . K' , is the stuffing box. L, is a groove in valve K. M, is a stop yieldingly held out of engagement with slot or groove L in valve K by spring m when the fusible plug G, is not in place in the device, but forced into engagement with such groove by such plug when the plug is in proper position as illustrated in Fig. 5. N, is a passage-way for steam or water extending from the valve-seat J' in the shell or casing J, through such shell or casing; such passage-way N being closed by the fusible plug G, and such passage-way performing the same functions as the passage-way e in hollow plug E, in the construction illustrated in Figs. 1, to 4, all inclusive. G' , is the hollow nut fitting into the casing J and having screw threads thereon by means of which it can be forced down upon the fusible plug G, thereby holding such fusible plug in place. In the fusible plug G, as such plug is constructed

for use in the construction illustrated in Fig. 5, there is placed a groove g' and in the casing J there is placed a spring I' , which is adapted to engage with the groove g' and thereby lock the plug in place.

In the modification illustrated in Fig. 6, the casing J is constructed substantially the same as in the construction illustrated in Fig. 5, the difference in such construction consisting of the omission of the plug M, spring m , and groove L, and the placing of the fusible plug G so that the stem g^3 of the plug shall form a stop interposed between the valve K and the valve-seat J' .

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a low water alarm the combination of a casing adapted to be secured to the shell of a steam boiler with a fusible plug, a valve in the casing between the fusible plug and the boiler, and a keyless lock automatically engaging with the fusible plug and preventing its removal from the casing except by fusing; substantially as described.

2. In a low water alarm the combination of a casing adapted to be secured to the shell of a steam boiler with a fusible plug, a valve in the casing between the fusible plug and the boiler, a keyless lock automatically engaging with the fusible plug and preventing its removal from the casing except by fusing, and a stop preventing the closing of the valve when the fusible plug is locked in position in the casing; substantially as described.

3. In a safety plug; the combination of a casing adapted to be secured to the shell of a steam boiler with a fusible plug, a passage-way extending through such casing closed by the fusible plug, a valve in the casing between the fusible plug and the boiler adapted to close such passage-way, a keyless lock automatically engaging with the fusible plug and preventing its removal from the casing

except by fusing and a stop engaging with and preventing the closing of the valve when the fusible plug is in position in the casing; whereby when the passage-way is closed by the fusible plug, such passage-way cannot be closed by the valve, and when such passage-way is not closed by the fusible plug, it can be closed by the valve; substantially as described.

4. In a safety plug the combination of a two part casing, one part thereof adapted to be secured to the shell of a steam boiler, a passage-way through such part of the casing, a hollow plug fitting into such passage-way and adapted to form a valve closing the same, and a fusible plug fitting into and adapted to close the opening through the hollow plug, and the other part of such casing adapted to be placed over the hollow plug and when placed thereon to form a cover for such fusible plug and also to form a stop preventing the closing of the valve formed by the hollow plug; substantially as described.

5. In a safety plug the combination of a two part casing, one part thereof adapted to be secured to the shell of a steam boiler, a passage-way through such part of the casing, a hollow plug fitting into such passage-way and adapted to form a valve closing the same, and a fusible plug fitting into and adapted to close the opening through the hollow plug, and the other part of such casing adapted to be placed over the hollow plug, and when so placed thereon to form a cover for the fusible plug and a stop preventing the closing of the valve formed by the hollow plug, and a spring in such part of the casing adapted to engage with the fusible plug and thereby lock it in position as such cover and stop; substantially as described.

CLARENCE E. VAN AUKEN.

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