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STAY BOLT STRUCTURE FOR BOILERS.

APPLICATION FILED JULY 31, 1917.

1,281,329. Patented Oct. 15, 1918.

Fig. 1.

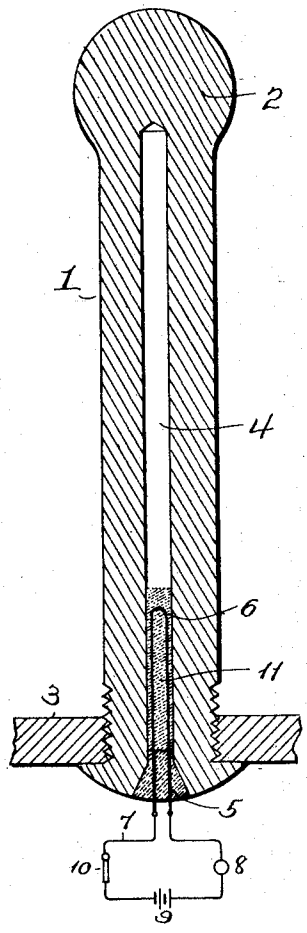


Fig. 2.

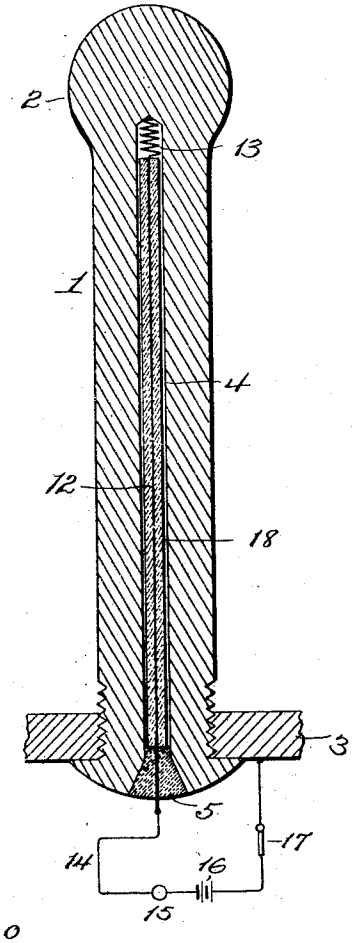
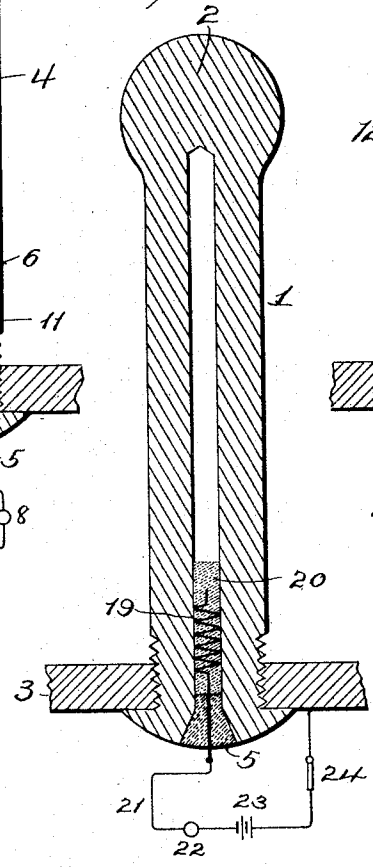


Fig. 3.



WITNESSES

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STAY-BOLT STRUCTURE FOR BOILERS.

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To all whom it may concern:

Be it known that we, JOHN ROGERS FLANNERY and ETHAN I. DODDS, citizens of the United States, and residents of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Stay-Bolt Structures for Boilers; and we do hereby 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.

This invention relates to improvements in stay-bolt structures for boilers and more particularly to simple and efficient testing means therefor,—the object of the invention being to provide means whereby the condition of the integrity of the bolt may be indicated visually at a suitable place exteriorly from the boiler.

A further object is to provide means which will, in the event of rupture of the bolt and entrance of moisture into the tell tale bore of the bolt, cause a light in an electrical circuit to be extinguished and thereby denote the ruptured condition of the bolt.

With these objects in view, the invention consists in certain novel features as hereinafter set forth and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view showing a stay bolt in section and illustrating the application of my improvements, and Figs. 2 and 3 are views of modifications.

1 represents a stay bolt of the flexible type having a spherical or partly spherical head 2 at one end and adapted at its other end for connection with a boiler sheet 3,—which in the present instance may be the inner boiler sheet. The bolt 1 is provided with a bore 4 which extends from the inner end of the bolt to and preferably within the headed end 2.

A plug 5, which may be of fire clay, is tightly fitted into the bore at the inner end of the bolt and carries a comparatively fine wire 6 which may be of copper and bent into U-form. The plug 5 supports the wire 6 in such manner that the latter will not make electrical contact with the bolt and said wire is included in an electrical circuit 7. This circuit also includes an electric lamp 8, a battery 9, and preferably also a switch 10. The wire 6 in the bore of the bolt is embedded in a mass of material 11 which fills the inner end portion of said bore sufficiently to cover all portions of said wire 6. The material 11 is such that upon the presence of moisture will cause the wire 6 to be corroded and thus severed and the circuit 7 to be opened and the light in the lamp 8 to be extinguished. Thus, if the wire 6 be of copper, the material 11 may contain a suitable sulfate such as crystallized sulfuric acid mixed with a filler such as cotton lint or mineral wool to give the mass sufficient bulk if necessary.

Should the bolt become ruptured, steam or water will enter the tell tale bore 4 and, by contact with the material 11, will cause reaction sufficient to effect the corroding and consequent severing of the wire 6 and thereby cause the extinguishing of the lamp at 8 to denote the rupture of the bolt.

In the form of the invention shown in Fig. 2, a wire 12 extends through the bore 4, having one of its ends supported by the non-metallic plug 5 and its other end connected electrically with the end wall of said bore in the head 2, as illustrated at 13. One end of this wire 12 is connected with one terminal of a circuit 14 including a lamp 15, a battery 16 and a switch 17 and the other terminal of this circuit is electrically connected with the boiler sheet 3. In this form of the invention, the fine wire 12 is covered throughout the major portion of its length with material 18 of the same composition as the material 11, above described.

In the form of the invention shown in Fig. 3, the non-metallic plug 5 carries a fine wire 19 in the form of a spiral and of such size that the convolutions of said spiral will make electrical contact with the wall of the bore 4 of the bolt. This coil is embedded in material 20, of the same composition as previously explained. One end of the coil 19 may be free and its other end is connected with one terminal of a circuit 21, including a lamp 22, a battery 23, and a switch 24,—the other terminal of said circuit being connected with a boiler sheet 3 so that when the wire 19 becomes dissolved by the chemical action of the material 20 in the presence of moisture entering the bore when the bolt becomes ruptured, the lamp 22 will be extinguished and the ruptured condition of the bolt thus denoted.

Having fully described our invention

what we claim as new and desire to secure by Letters-Patent is,—

1. The combination with a stay bolt having a bore, of an electrical conductor in said bore and included in a circuit with a signal, and material within the bore and contacting with said conductor, said material being such as will by contact with moisture cause severance of said conductor to open the signal circuit.

2. The combination with a stay bolt having a bore, of means in said bore for controlling the action of a signal when moisture enters said bore, and a signal located exteriorly of the bolt and connected with said means.

3. The combination with a stay bolt having a bore, of an electrical conductor within said bore, an electric circuit including said conductor and a lamp in a normally closed circuit, and material in said bore for destroying said conductor and opening the lamp circuit when moisture enters the bore.

4. The combination with a stay bolt having a bore closed at one end, of a non-metallic plug inserted into the open end of said bore, an electrical conductor located within the bore and passing through said plug, corroding material engaging said conductor within the bore, and a normally closed electrical circuit including said conductor and a lamp.

5. The combination with a stay bolt having a bore, of a non-metallic plug closing one end of said bore, an electrical conductor carried by said plug and disposed within the bore, corroding material inclosing said conductor within the bore, and an electrical circuit including a battery and a lamp and having its terminals connected with respective ends of said conductor.

In testimony whereof, we have signed this specification in the presence of two subscribing witnesses.

JOHN ROGERS FLANNERY.
ETHAN I. DODDS.

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