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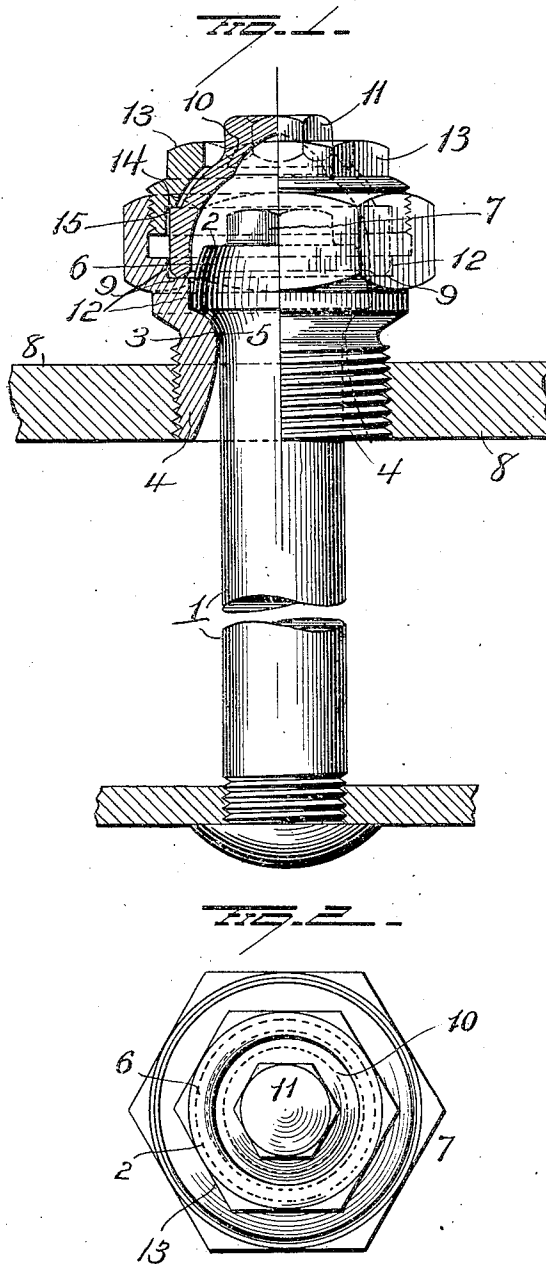
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STAY BOLT FOR BOILERS.

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1,042,833.

Patented Oct. 29, 1912.



WITNESSES

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STAY-BOLT FOR BOILERS.

1,042,833.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed December 13, 1911. Serial No. 665,506.

To all whom it may concern:

Be it known that I, BENJAMIN E. D. STAFFORD, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Stay-Bolts for Boilers; and I 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.

My invention relates to an improvement in stay bolts for boilers, and it consists in the details of construction as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view partly in section and partly in elevation, showing the bolt applied to the inner and outer sheets of a boiler, and Fig. 2 is a view in plan of the same.

1 represents the bolt provided with a head 2, the portion thereof which rests on the seat 3 of the sleeve or bushing 4, being concave as at 5, while the portion 6 thereof above the concave bearing portion is convex, and preferably the segment of a sphere the extreme top of the head being in the form of an angular boss 7 adapted to be engaged by a wrench.

Secured within the outer sheet 8 of the boiler, is the sleeve or bushing 4, threaded externally for engagement with said outer sheet 8, and preferably made slightly tapering so as to form a steam tight joint. The bore of the bushing or sleeve 4 below the seat 3, is convex and flares outwardly from the seat 3 to its lower end, so as to provide for the free movement and deflection of the bolt, during the expansion and contraction of the sheets, the curved surface of the bore of the sleeve or bushing, also aiding the bolt during the deflections of the latter in breaking up and dislodging incrustation which forms thereon. The sleeve or bushing is provided above its convex seat 3, with an annular seat or bearing 9, for the V-shaped or knife blade edge of the soft metal cap 10, which latter rests thereon and forms a housing for the head of the bolt and a closure for the sleeve or bushing. The cap may be stamped or cast, and is made of copper or copper alloy or other comparatively soft metal, so that when clamped against its seat within the sleeve or bushing 4, the knife blade edge of the cap will flatten out and form a per-

fect steam tight joint. The cap is concave on its inner face and is removed from the head of the bolt sufficiently to permit of the free movement of the latter, and is provided centrally on its outer surface with an angular, preferably rectangular boss 11, to be engaged by a wrench whereby the cap may be turned on its seat, before it is fully clamped in place, to clean its bearing surface and also clean the seat or bearing 9 on the bushing. The sleeve or bushing is also provided with an annular shoulder 12, at right angles to and at the outer edge of the seat or bearing 9, which shoulder forms an abutment for the lower end of the cap and prevents the latter from expanding or bulging outwardly under the crushing or compressing action of the nut 13. The upper end of the sleeve or bushing 4 is threaded internally to receive the lower end of the externally threaded nut 13, which latter has an annular shoulder 14 adapted to rest on upper flat surface 15 of the rim of the cap. This shoulder 14 is in the vertical plane of the seat or bearing 9 on the bushing, hence as the compressive strains are in a vertical plane, there is no strain tending to collapse the cap while under compression. The lower end of the nut extends down adjacent the outer side of the rim of the cap, and assists the shoulder 12 in preventing any undue outward expansion of the rim, while the upper portion of the nut overhangs the cap and protects the same against fracture or excessive stretching due to contact with the bolt when the latter is forced outwardly by the expansion of the inner sheet. The boss 11 on the cap projects through and beyond the nut so as to be engaged by a wrench after the parts have been assembled.

The cap 10 not only forms a closure for the bushing, or sleeve, but being of softer metal than the bushing and the nut, serves as a packing, thus dispensing with the use of a gasket or other packing, which in many forms of bolts are necessary in order to secure a steam tight joint.

I make no claim in this application to a stay bolt structure comprising a bolt having a head, a sleeve or bushing having an internal seat for said head, a soft metal cap forming a closure for the sleeve or bushing and a nut for locking the cap to the bushing, as the same forms the subject matter of

my pending application No. 665,504 filed December 13th 1911.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of the claims annexed. Hence I would have it understood that I do not wish to confine myself except as required by the scope of said claims to the exact construction and arrangement of parts shown and described, but

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

15 1. A stay bolt structure comprising a bolt having a head, a sleeve or bushing having an internal seat for said head and also provided with an annular seat or bearing, and with an annular shoulder at the outer edge
20 of said seat, a cap resting on said seat and supported laterally by said shoulder, and a nut having external threads engaging internal threads on the upper end of the sleeve or bushing and provided with an internal
25 shoulder which bears against the top surface of the rim of the cap.

2. A stay bolt structure comprising a bolt having a head, a sleeve or bushing having an internal seat for said head, and also provided with an annular shoulder at the outer
30 edge of said seat, a soft metal cap having a

V-shaped lower end resting on said seat and sustained laterally by said shoulder, and a nut having external threads engaging internal threads on the upper end of the sleeve
35 or bushing and provided with an internal shoulder which bears against the top surface of the rim of the cap, the said nut overhanging the rim of said cap.

3. A stay bolt structure comprising a bolt
40 having a head the bearing surface of which is concave and the part thereof above its bearing surface convex, a sleeve or bushing having a convex seat on which the concave surface of the bolt head rests, a removable
45 cap resting on a seat on the bushing and forming a closure for the latter, and a nut secured to said bushing and bearing against the top of said cap.

4. A stay bolt structure comprising a bolt
50 having a head, a sleeve or bushing having an internal seat for said head, the sides of said sleeve below the seat being convex, and a cap or closure for said sleeve or bushing.

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

BENJAMIN E. D. STAFFORD.

Witnesses:

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