

1,042,832.

A detailed technical drawing of a mechanical assembly, likely a valve or a pump component, shown in a cross-sectional view. The drawing is divided into two main sections by a horizontal line. The upper section shows a complex assembly of parts, including a central shaft (1) with a curved, bulbous end (3) that fits into a housing (2). The housing has various internal features and a flange (7) at the top. A nut (8) is shown on the right side of the housing. The lower section shows a threaded rod (5) passing through a plate (4) and a flange (6). The rod is connected to a central shaft (1) which has a curved, bulbous end (3) that fits into a housing (2). The drawing includes various hatching patterns to indicate different materials and cross-sections. Numbered labels 1 through 12 identify specific components: 1 is the central shaft, 2 is the housing, 3 is the curved end of the shaft, 4 is a plate, 5 is a threaded rod, 6 is a flange, 7 is a top flange, 8 is a nut, 9 is a seal or gasket, 10 is a bolt, 11 is a flange, and 12 is a bolt. A dashed line indicates a hidden part of the assembly.

A technical drawing of a hexagonal nut, viewed from the top. The drawing shows a central hexagonal hole (8) surrounded by a series of concentric rings. The outermost ring is labeled 1. Inside it is a ring labeled 2, followed by a ring labeled 3. The central hole is labeled 8. The inner hexagonal shape is labeled 7. The outer hexagonal shape is labeled 11. The inner hexagonal shape is also labeled 12. The drawing is a black and white line drawing with various dashed and solid lines indicating different features and dimensions.

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FLEXIBLE STAY-BOLT FOR BOILERS.

1,042,832.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed December 13, 1911. Serial No. 665,505.

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 Flexible 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 flexible stay bolts for boilers, the object being to provide a simple and effective detachable steam tight closure for the outer end of the bolt; 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 in elevation partly in section showing the bolt applied to the inner and outer sheets of a boiler, and Fig. 2 is a view in plan.

1 represents a bolt having a substantially spherical head 2 at one end and threaded at the opposite end, the head 2 being provided with a slot 3 for the engagement of a suitable driver.

Secured to the outer sheet 4 of the boiler, is the sleeve or bushing 5, threaded externally, and may be cylindrical, but is preferably slightly tapering externally, so that as it is screwed into the outer sheet 4, the wedging action produces an absolutely steam tight joint. The inner end of this bushing has a bore or opening of greater diameter than the bolt 1, and is made concave, as shown in Fig. 1, below the seat 6 within the sleeve or bushing on which the bolt head 2 rests.

The curvature of the inner surface of the bore of the sleeve below the seat, is preferably in the segment of an oval as shown in dotted lines, which form is well adapted for loosening and breaking up incrustation by the deflection of the bolt.

The bushing 5 receives the head 2 of the bolt 1 and houses the same, and is provided internally with the seat 6, formed preferably in the arc of a circle concentric with the head of the bolt, the curvatures of the inner surface of the sleeve or bushing above and below seat 6, permitting of a universal

movement of the head on its seat during the expansion and contraction of the sheets to which the bolt is connected. The cavity within the sleeve or bushing 5 above the seat 6, is of a size sufficient for the free entrance of the head, and the outer end of said bushing has a pointed ridge, preferably in the shape of an inverted V on which the rim of the copper or other soft metal cap 7 rests. This cap may be stamped or cast, and is made of copper, copper alloy or other comparatively soft metal, so that when forced or compressed against the outer end of the bushing or sleeve 5, the latter will be forced into the softer metal cap, and the latter will conform itself to the harder metal seat, and thus form a steam tight joint.

The cap is concave on its inner face and is sufficiently removed from the bolt head to afford clearance for the movement of the bolt due to expansion of the sheets, and is provided centrally on its outer surface with an angular, preferably hexagonal boss 8, adapted 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 the bearing surface of the bushing or sleeve. This cap is also provided on its outer surface with an annular shoulder 9 adapted to be engaged by the lip 10 of the clamping nut 11. This nut is threaded at its lower end to engage the external threads on the upper end of the bushing or sleeve, and is provided internally, intermediate its lower end and its overhanging lip 10, with an annular rib 12, which forms an abutment or bearing for the rim of the cap 7, and prevents the latter from spreading or crushing under the clamping action of the nut. This nut overhangs the cap 7 within the plane of the clamping lip 10, but is removed from said cap so as to permit the latter to give or bulge under excessive pressure, but overhangs the cap sufficiently to prevent complete rupture of the latter under excessive strains. The boss 8 projects through and beyond the nut so as to be engaged by a wrench after the parts have all been assembled.

The cap 7 not only forms a closure for the bushing or sleeve, but being of softer metal than the bushing and nut, serves as a

packing thus dispensing with a separate gasket which is used to secure a steam tight joint.

5 By employing a cap of softer metal than the bushing and its nut, I expedite the handling of the parts and obtain a perfect fit between the parts without the employment of gaskets or any other packing.

10 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 15 December 13th, 1911.

20 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 25 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:—

30 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 inverted V-shaped upper end, a soft metal cap seated on said inverted 35 V-shaped end, and a nut screwed to the sleeve or bushing and provided with an annular lip resting on the rim of the cap, and with an annular rib adapted to form an abutment for the rim of the cap. 40

2. 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 having a centrally located external angular boss, the said cap being mounted on said 45 sleeve or bushing and forming a closure for same, and a nut for locking the cap to the bushing.

In testimony whereof, I have signed this specification in the presence of two sub- 50 scribing witnesses.

BENJAMIN E. D. STAFFORD.

Witnesses:

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