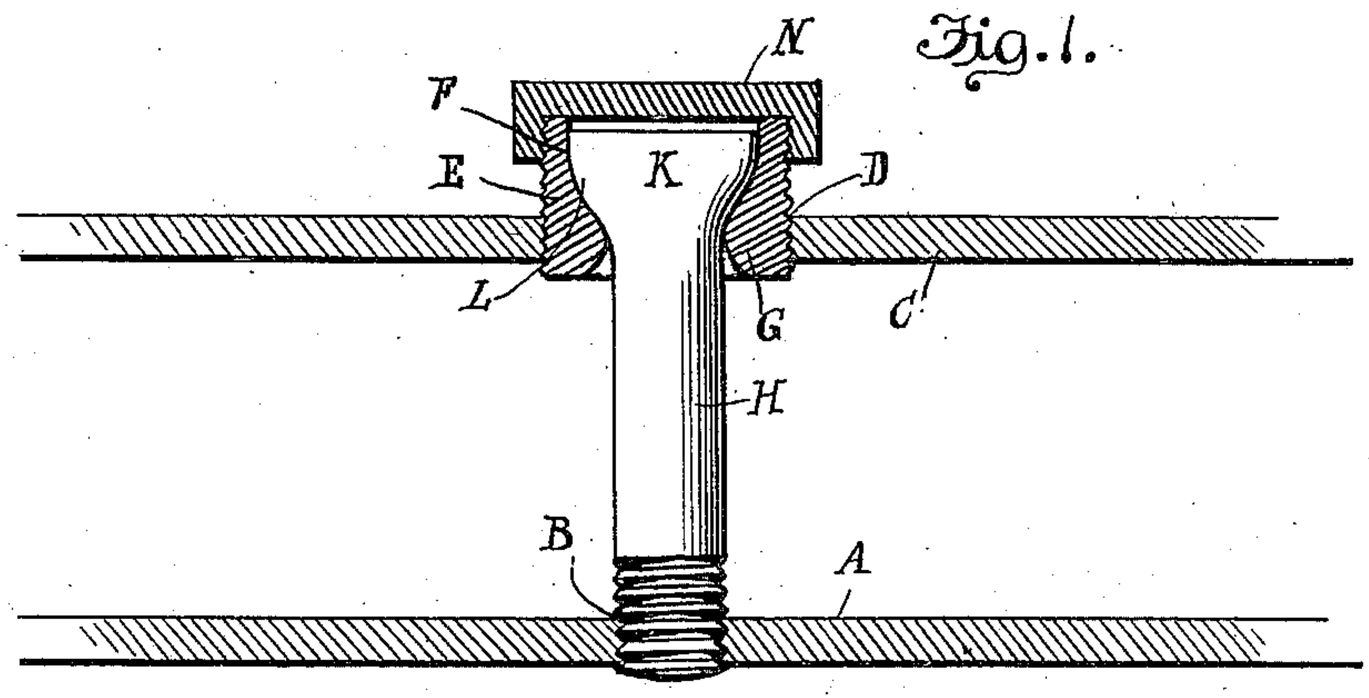
P. J. CONNORS.

STAY BOLT FOR STEAM BOILERS.

APPLICATION FILED DEC. 29, 1908.

987,431. Patented Mar. 21, 1911.

Fig. 1.



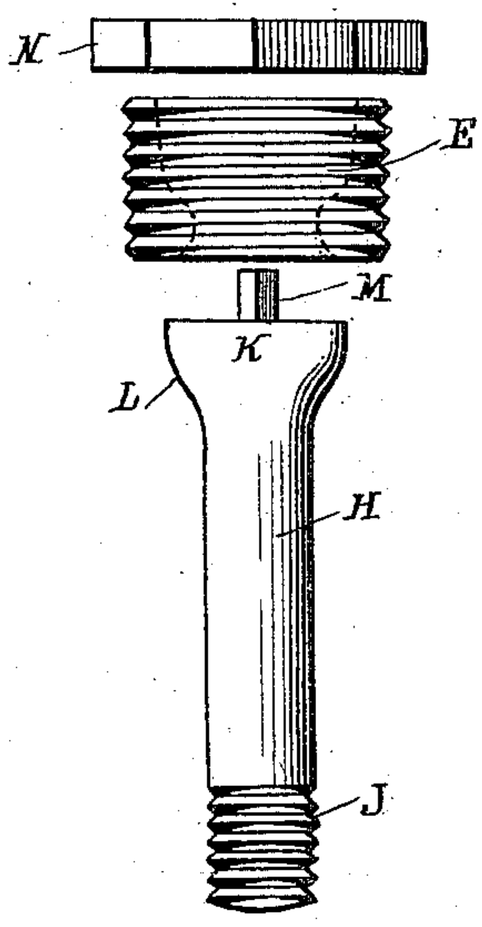
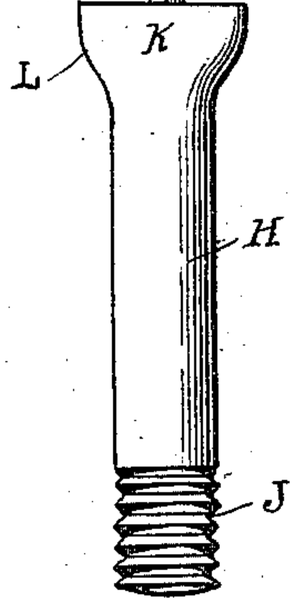


Fig. 2.

Fig. 3.



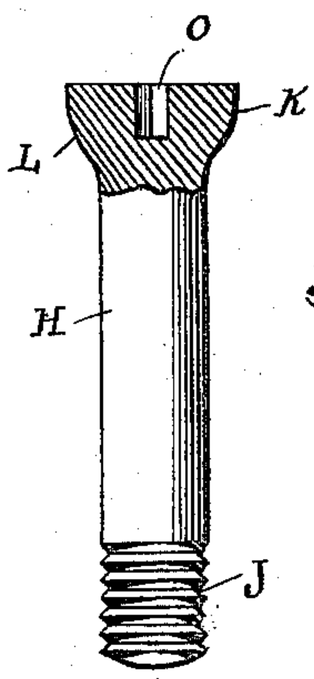


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

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STAY-BOLT FOR STEAM-BOILERS.

987,431. Specification of Letters Patent. **Patented Mar. 21, 1911.**

Application filed December 29, 1908. Serial No. 469,827.

To all whom it may concern:

Be it known that I, PATRICK J. CONNORS, a citizen of the United States, residing at Greenville, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Stay-Bolts for Steam-Boilers, of which the following is a specification, reference being had therein to the accompanying drawing.

My present invention relates to an improved stay bolt for steam boilers, the main object of the invention being the provision of a stay bolt, which is provided with means whereby the same may be quickly, economically and properly placed in position, which will retain the boiler sheets or fire box sheets securely together and accommodate itself to the unequal expansion of the boiler plates, the same setting close to the boiler on the outside.

To clearly understand my invention, attention is directed to the accompanying drawings, in which:—

Figure 1 is a sectional view through the inner and outer plates with my stay bolt in position. Fig. 2 is a side elevation of the complete stay bolt, and its parts removed in order. Fig. 3 is the preferred form of bolt, and Fig. 4 is a modified form.

Referring to the drawings:—A designates the inside boiler plate, which is provided with the threaded opening B, and C is the outer plate, which is provided with the enlarged threaded opening D. Secured within the opening D, is the exteriorly threaded sleeve or nipple E, whose interior is provided with the upper cupped-shaped socket or seat F, terminating in the lower outwardly curved and rounded annular rim or abutment G. The said seat is positioned at a point nearer the inner end of the sleeve E than the outer end thereof and in a plane with the center of the outer boiler plate C, when the device is assembled.

My stay bolt H, consists of the body portion having the lower threaded end J, which is adapted to pass through the opening D, and be secured in the opening B, as clearly shown in Fig. 1, the head K, of the bolt having the lower rounded or curved portion L, which seats upon the seat F.

In order that the bolt may be properly screwed into position, I have provided several ways, first as shown clearly in Fig. 3, I provide the integral squared lug M, which is formed centrally of the upper or outer face of the head, the same when the bolt is seated, being broken off, so the cap N, may be secured in place, as shown in Fig. 1. The bolt shown in Fig. 4, is provided with the squared socket O, or may be provided with spanner openings, for the insertion of a tool to turn the bolt.

From the foregoing description, it will be seen that the peculiarly shaped sleeve or nipple E, provides a seat and also allows the bolt to be moved freely in all directions, thus taking up all directions of expansion and contraction, and providing a strong, effective, and cheap flexible stay bolt and fastening means therefor.

What I claim, as new, is:—

In combination with a stay bolt having a threaded inner end and a head upon the other end thereof, said head having a rounded shouldered portion adjacent to the bolt and provided with a flat outer face, said flat outer face being further provided with a square central lug projecting therefrom whereby the bolt is screwed in place, said lug being adapted to be sheared off even with the flat face, of a removable bushing detachably fitted in an outer boiler plate and provided with a passage-way therethrough, an annular shoulder in said passage-way forming with said bushing a socket to co-act with the rounded shoulder portion of the bolt head to form a ball and socket joint, said passage-way curvedly flaring outwardly from said shoulder in opposite directions to the opposite ends of the bushing, said shoulder being positioned

nearer the inner end of the bushing and substantially in the plane of the center of the outer boiler plate, and a flat closure cap fitting exteriorly upon the bushing and over and parallel to the top face of the head of the bolt and lying spaced from the flat face of the bolt when the cap is screwed down upon the bushing, and a side movement of the bolt being limited by the position of the cap upon said bushing.

In testimony whereof I affix my signature in presence of two witnesses.

PATRICK J. CONNORS.

Witnesses:

PATRICK CALLAHAN,

JAMES M. CONNELLY.