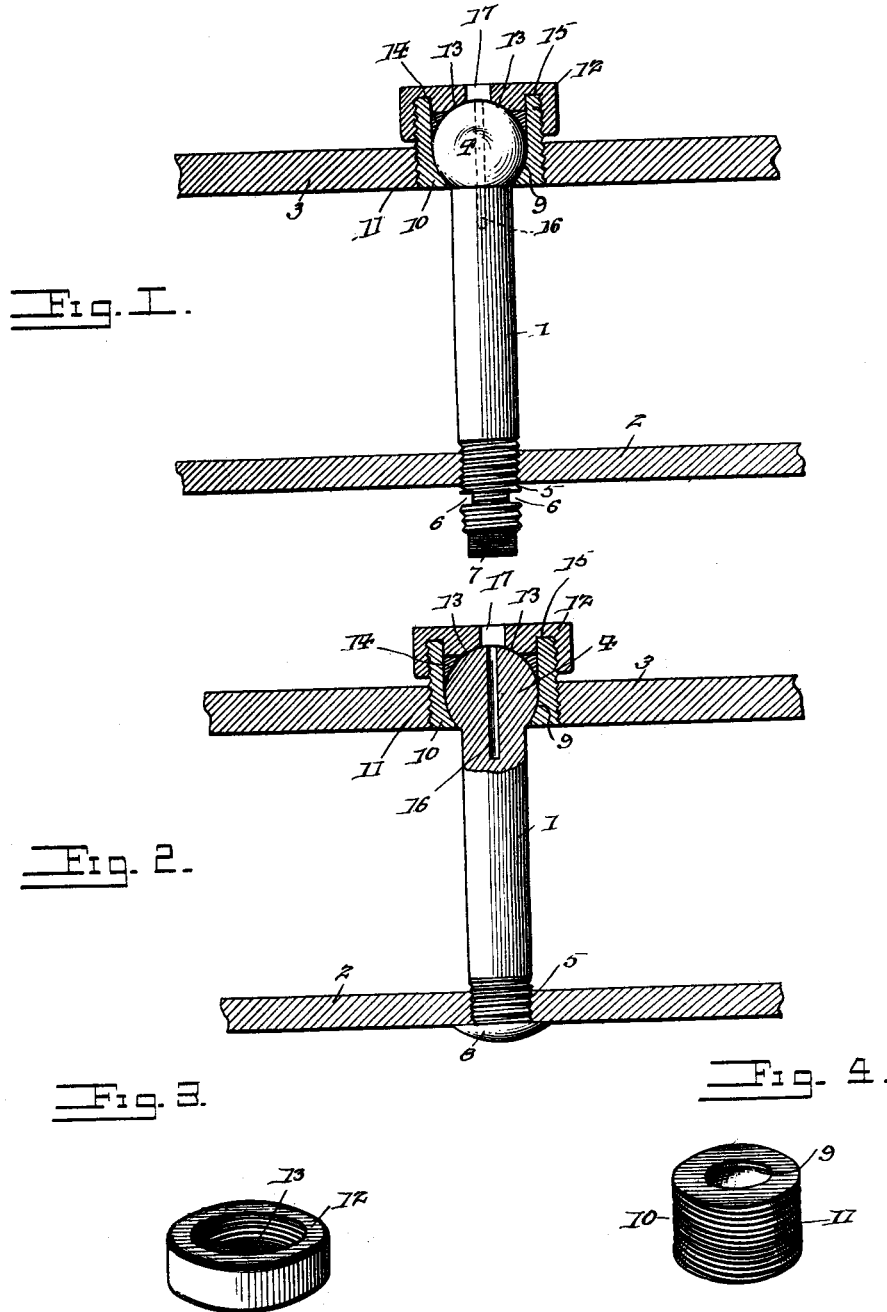


No. 675,935.

Patented June 11, 1901.

J. H. DAVENPORT.
STAY BOLT FOR STEAM BOILERS.
(Application filed Feb. 18, 1901.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN H. DAVENPORT, OF OMAHA, NEBRASKA, ASSIGNOR OF ONE-HALF TO
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STAY-BOLT FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 675,935, dated June 11, 1901.

Application filed February 18, 1901. Serial No. 47,827. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. DAVENPORT, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented a new and useful Stay-Bolt for Steam-Boilers, of which the following is a specification.

The invention relates to improvements in stay-bolts for steam-boilers.

One object of the present invention is to improve the construction of stay-bolts for steam-boilers and to provide a simple and comparatively inexpensive one of great strength and durability adapted to provide a movable connection between it and the outer sheet of a steam-boiler, whereby all lateral strain on the head of the bolt will be prevented and a uniform tensile strain insured, so that breakage of a bolt will be effectually prevented.

Another object of the invention is to prevent the inner and outer sheets of a steam-boiler from increasing or decreasing the distance between them when they expand under pressure and when the latter is removed.

The invention also has for its object to provide a construction of this character which will admit of the employment of a telltale hole or bore for indicating breakage which may result from defective material.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a sectional view showing a stay-bolt constructed in accordance with this invention and applied to the inner and outer sheets of a boiler, the bolt being shown in elevation. Fig. 2 is a similar view, the outer end or head of the bolt being shown in section and its inner end being riveted. Fig. 3 is a detail perspective view of the cap. Fig. 4 is a similar view of the bearing-sleeve.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a stay-bolt designed to connect the inner and outer sheets 2 and 3 of a steam-boiler and provided at its outer end with a round head or ball 4 and having its inner portion 5 threaded for engaging a threaded open-

ing of the inner sheet 2 of the boiler. The inner threaded portion 5 of the bolt is extended and provided at opposite sides with notches 6, and it has a polygonal extremity 7, adapted to receive a wrench for screwing the bolt in place, and after the parts have been assembled the extended end of the bolt is cut off and is upset against the inner face of the inner sheet to form a head 8 for riveting the inner end of the bolt.

The head of the bolt is arranged within a socket 9 of a bearing-sleeve 10, having exterior screw-threads 11 for engaging a threaded opening of the outer sheet of the boiler and also to receive a cap 12. The inner end or bottom of the socket is rounded to provide an annular concave bearing-surface to conform to the configuration of the inner portion of the round head or ball of the bolt which extends through the inner end of the sleeve, as clearly shown in Fig. 1. The exteriorly-threaded sleeve is extended outward beyond the outer sheet, and, if desired, suitable jam-nuts may be provided for clamping it against the outer sheet.

The cap 12 is provided with interior screw-threads to engage those of the bearing-sleeve, and it has a central bearing portion 13 presenting an inner concave face to conform to the configuration of the outer side of the head or ball 4, and a metallic gasket or packing 14 is arranged within the outer end of the bearing-sleeve. The metallic gasket or packing 14, which may be lubricated by any suitable substance, is held in engagement with the ball by the cap, and it presents an inner annular concave face to the same. The cap is provided with an interior annular groove 15, surrounding the central portion 13 and receiving the outer end of the sleeve. The concave bearing-surfaces of the cap and the sleeve and the gasket form a socket which conforms to the configuration of the ball or head, and a flexible connection or joint is provided between the bolt and the outer sheet of the boiler, whereby all lateral strain on the bolt is eliminated and the uniform tensile strain is effected, thereby reducing the liability to breakage to a minimum.

The bolt is provided at its outer portion with a longitudinal telltale hole or bore ex-

tending inward beyond the inner face of the outer boiler-sheet and adapted, should the bolt break through defective material, to readily indicate such fact by the escape of steam or water through the said bore or opening 16. The cap is provided with a central aperture 17 of greater diameter than the bore or opening. The stay-bolt is adapted to be applied to the inner and outer sheets of locomotive-boilers and various other steam-boilers, and it is adapted to prevent the inner and outer sheets from varying the distance between them when they are under pressure and when they are not subjected to pressure. The bolt is subjected to the same strain at all angles, so that it will not be broken by a lateral or twisting strain.

It will be seen that the stay-bolt is exceedingly simple and inexpensive in construction, that it is positive and reliable in its action in preventing the inner and outer sheets from varying the distance between them, and that a flexible or ball-and-socket joint is provided at the head of the bolt, which will permit the bolt to be arranged at an angle to the outer sheet without being twisted or subjected to a lateral strain. Furthermore, it will be clear that the head of the bolt bears against the inner end of the sleeve and the cap, so that an equal bearing or support is provided at its inner and outer sides.

What I claim is—

1. The combination with the inner and outer sheets of a boiler, of a bearing-sleeve mounted on the outer sheet and provided with a socket, a bolt provided at its outer end with a ball arranged in the socket, said bolt having a telltale-bore extending from its outer end to a point beyond the inner face of the outer sheet, and means for securing the inner end of the bolt to the inner sheet, substantially as described.

2. In a device of the class described, the combination with the inner and outer sheets

of a boiler, of a bearing-sleeve mounted on the outer sheet and having a socket, a bolt connected with the inner sheet and provided at its outer end with a ball arranged within the socket, said bolt having a telltale-bore extending from its outer end to a point beyond the inner face of the outer sheet, and a cap arranged on the bearing-sleeve and provided with an inner bearing-face to fit against the ball and having an aperture arranged at the outer end of the bore, substantially as described.

3. A device of the class described comprising a bolt having an inner threaded portion and provided at its outer end with a ball, a sleeve designed to be mounted on the outer sheet of a boiler and having a socket to receive the ball, a cap arranged on the outer end of the sleeve and having a central bearing and provided with an annular groove receiving the outer end of the sleeve, and a gasket or packing arranged within the sleeve at the outer end thereof and held against the ball by the cap, substantially as described.

4. In a device of the class described, the combination with the inner and outer sheets of a boiler, of an exteriorly-threaded bearing-sleeve mounted in a threaded opening of the outer sheet and provided with a socket, a bolt having a round head or ball arranged in the socket, an interiorly-threaded cap engaging the outer end of the socket and provided with an inner bearing-face fitting against the outer face of the ball, and a gasket arranged within the outer end of the bearing-sleeve and held against the ball by the cap, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN H. DAVENPORT.

Witnesses:

J. A. THOMPSON,
E. H. WARTNABY.