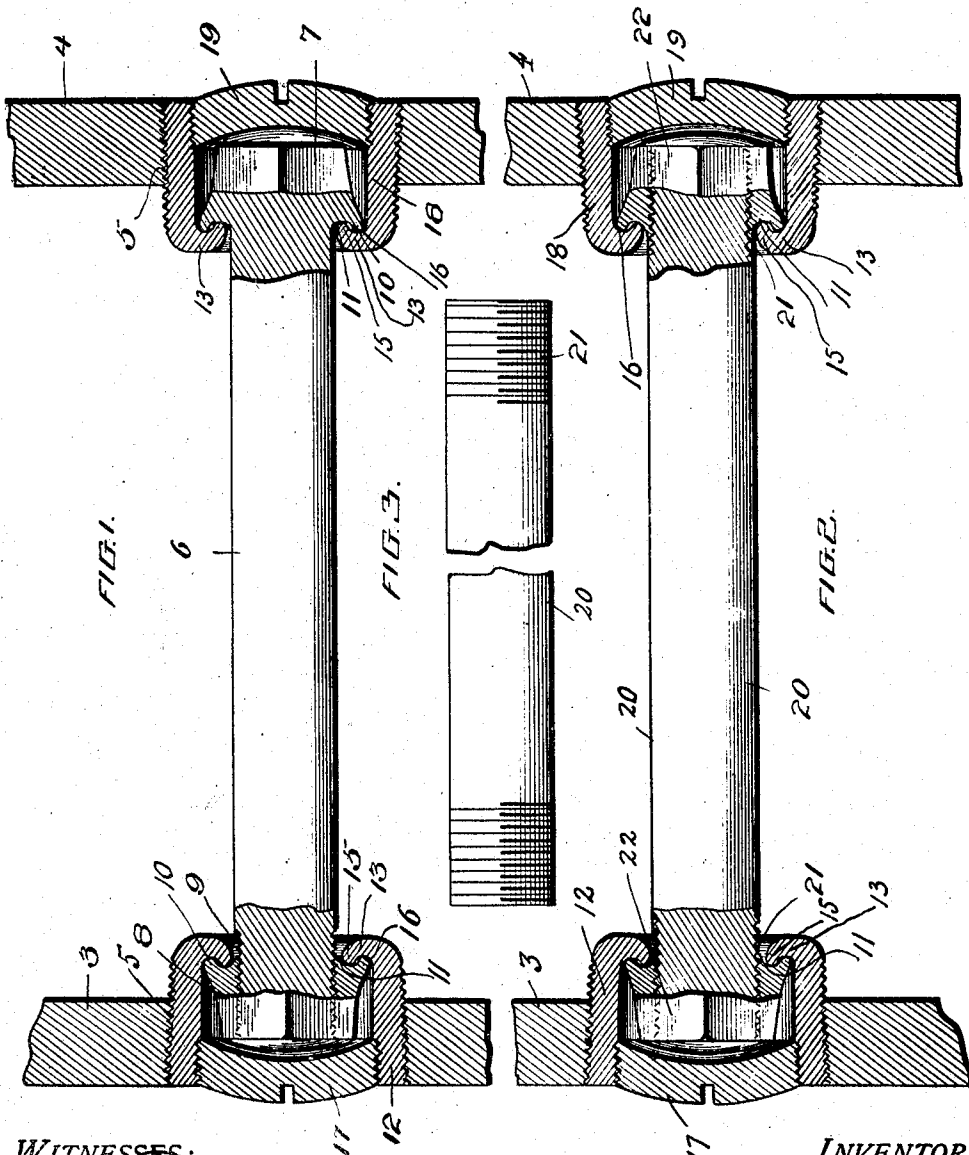


W. M. SMITH.
STAY BOLT.

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WITNESSES:

W. F. Rayle.
W. E. Louny

INVENTOR

William M. Smith.

BY

A. M. Nelson
Attorney

UNITED STATES PATENT OFFICE

WILLIAM M. SMITH, OF TURTLE CREEK, PENNSYLVANIA.

STAY-BOLT.

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To all whom it may concern:

Be it known that I, WILLIAM M. SMITH, a citizen of the United States, residing at Turtle Creek, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Stay-Bolts, of which the following is a specification.

This invention relates to that class of stay bolts which are used for the purpose of staying sheets of locomotive and other steam boilers and the object thereof is to provide a stay bolt with means at each end thereof whereby a steam tight connection is had between the boiler sheet and the ends of the bolt and furthermore whereby the necessary degree of flexibility for the bolt is obtained to overcome breakage of the bolt due to expansion of the boiler sheets when building up the fire or to high pressure steam.

Further objects of the invention are to provide a flexible stay bolt which shall be simple in its construction strong, durable, efficient in its use, readily set up and inexpensive to manufacture.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangements of parts hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings, wherein like reference characters denote corresponding parts throughout the several views, Figure 1 is a side elevation, partly in section, of a flexible stay bolt in accordance with this invention showing the adaptation thereof in connection with the inner and outer sheets of a boiler. Fig. 2 is a view similar to Fig. 1 of a modification, and, Fig. 3 is a side elevation of the shank employed in connection with the form shown in Fig. 2, the shank being broken intermediate its ends.

In connection with a stay bolt in accordance with this invention either or both ends thereof when a boiler sheet or sheets expand, move laterally, that is to say the direction of movement of the bolt at one or both of its ends is vertical or at right angles with respect to the expansive movement of the sheet or sheets.

Referring to Figs. 1 and 2 of the draw-

ings, 3 denotes the outer sheet of the boiler and 4 the inner sheet, each of said sheets is formed with openings 5, the openings of one sheet being arranged opposite the openings 6 of the other sheet and the walls of the openings are formed with screw-threads.

Referring to Fig. 1 of the drawings the shank of the bolt is indicated by the reference character 6 and at one end is formed with an integral head 7 and at its other end with a removable head 8. That end of the shank 6 which is provided with the removable head 8 is threaded as at 9, the said threads engaging with the interior threads of the removable head 8, the latter being in the form of a cap. The fixed head 7 as well as the removable head 8 has formed on its inner terminus an annular flange 10 having the periphery thereof rounded. The flange 10 is flared and projects to such an extent as to be positioned in a plane inwardly of the plane in which the inner face 11 of either of the heads extends. The width of the flange 10 in cross section is less than the width of the inner face 11 of either of the heads. The inner face 11 of either of the heads of the bolt is rounded and constitutes a seat for the terminus of a flange to be hereinafter referred to. Secured to the boiler sheet 3 is a tapering plug 12, which extends through the opening 5 and engages with the threads of the wall of said opening. For such purpose the plug 12 is peripherally threaded. The plug 12 projects from the inner face of the sheet 3 and has its inner end inturned as at 13 to provide a flange 15 which projects toward the inner face of the sheet 3. The inturned portion 13 is rounded to provide a curvilinear seat 16 of greater width in cross section than the outer terminus of the flange 10. The terminus of the flange 15 is rounded and the said flange 15 is of less width than the inner face 11 of either of the heads. The plug 12 is closed through the medium of a cap 17, the plug 12 is adapted to receive the removable head 8 of the bolt. Secured to the sheet 4 is a tapering plug 18 for the reception of the fixed head 7 of the bolt. The inner end of the plug 18 is constructed in the same manner as the inner end of the plug 12, the same reference characters being applied thereto. The plug 18 is secured to the sheet 4 in the same manner as the plug 12 and is also closed by a cap 19.

By the foregoing construction and ar-

angement of parts it is evident that, if either of the boiler sheets expand, the bolt will shift laterally owing to the width of the flanges 10 with respect to the seats 16 and the width of the flange 15 with respect to the width of the inner face 11, under such conditions the necessary flexibility is obtained for the bolt to prevent breakage thereof when the sheets expand.

In the construction shown in Figs. 2 and 3, the shank of the bolt is indicated by the reference character 20 and each end is screw-threaded as at 21 to receive a removable head 22. The construction of each of the heads 22 is similar to that of the head 8 and like reference characters are applied thereto. The form of bolt shown in Figs. 2 and 3 is mounted in the same manner as the bolt shown in Fig. 1, like reference characters being applied.

By providing the removable head at one end or at both ends, it is evident that provision is made whereby the length of that portion of the shank which is arranged within the boiler can be increased or diminished as desired. The removable head or heads is or are squared at the outer end or ends so that the removable head or heads can be adjusted by hand or by a suitable tool.

What I claim is:

1. A flexible stay bolt comprising a shank having each end provided with a head, each of the heads having projecting therefrom a flaring flange, said flanges extending toward each other.

2. A flexible stay bolt comprising a shank having each end provided with a head, each of the heads having projecting therefrom a flaring flange, said flanges extending toward each other, one of said heads being removable.

3. A flexible stay bolt comprising a shank having each end provided with a head, each of the heads having projecting therefrom a flaring flange, said flanges extending toward each other, each of said flanges constituting a bearing, combined with means for coupling the bolt to the boiler sheet, said means formed with bearings associated with said flanges.

4. A flexible stay means for boiler sheets comprising a pair of plugs adapted to be secured to opposite sheets of a boiler and each having its inner end inturned to provide a flange and a seat, and a bolt comprising a shank having each end provided with a head, each of said heads formed with a flange and having its inner face constituting a bearing, the bearings formed by the inner faces of the heads associating with the flanges of the plugs and the flanges associating with the seats of the plugs.

5. A flexible stay means for boiler sheets comprising a pair of plugs adapted to be secured to opposite sheets of a boiler and each having its inner end inturned to provide a flange and a seat, and a bolt comprising a shank having each end provided with a head, each of said heads formed with a flange and having its inner face constituting a bearing, the bearings formed by the inner faces of the heads associating with the flanges of the plugs and the flanges associating with the seats of the plugs, one of said heads being adjustably connected to the shank.

6. A flexible stay means for boiler sheets comprising a pair of plugs adapted to be secured to opposite sheets of a boiler and each having its inner end inturned to provide a flange and a seat, and a bolt comprising a shank having each end provided with a head, each of said heads formed with a flange and having its inner face constituting a bearing, the bearings formed by the inner faces of the heads associating with the flanges of the plugs and the flanges associating with the seats of the plugs, the flanges of each of the heads in cross section being of less width than the inner faces of the head between the flange and the junction of the inner face of the head with the shank and the inner face of each of the flanges of the plugs of less width in cross section than the width of the seat formed by the inturned end of the plug.

7. A flexible stay means for boiler sheets comprising a pair of plugs adapted to be secured to opposite sheets of a boiler and each having its inner end inturned to provide a flange and a seat, and a bolt comprising a shank having each end provided with a head, each of said heads formed with a flange and having its inner face constituting a bearing, the bearings formed by the inner faces of the heads associating with the flanges of the plugs and the flanges associating with the seats of the plugs, the flanges of each of the heads in cross section being of less width than the inner faces of the head between the flange and the junction of the inner face of the head with the shank and the inner face of each of the flanges of the plugs of less width in cross section than the width of the seat formed by the inturned end of the plug, one of said heads adjustably connected to the shank.

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

WILLIAM M. SMITH.

Witnesses:

A. M. WILSON,
N. LOUIS BOGAN.