

J. BOERO.
STAY BOLT FOR BOILERS.
APPLICATION FILED MAR. 22, 1912.

1,050,097.

Patented Jan. 14, 1913.

Fig. 1.

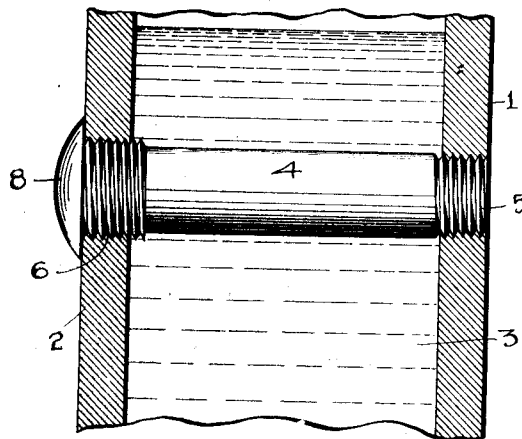


Fig. 2.

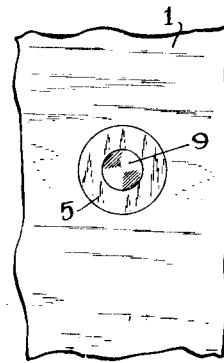


Fig. 3.

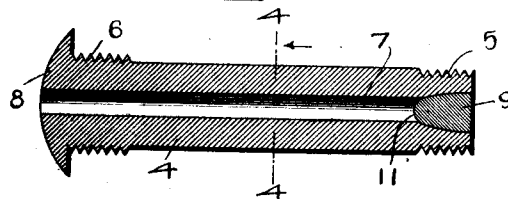


Fig. 4.

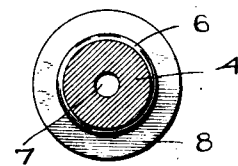


Fig. 5.

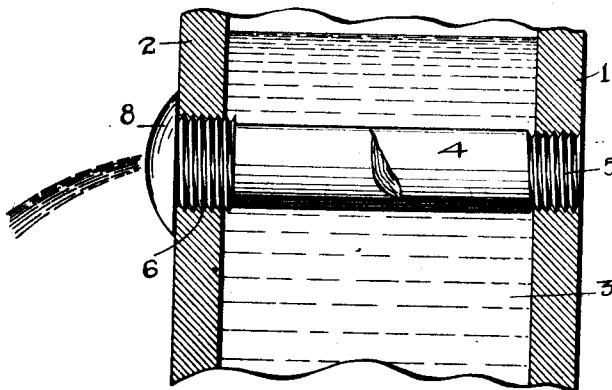


Fig. 6.



Fig. 7.



WITNESSES

John Chaff
Geo. A. Smith

INVENTOR:

Joseph Boero.
BY *Chas. W. C. Chapman,*
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOSEPH BOERO, OF NEW YORK, N. Y.

STAY-BOLT FOR BOILERS.

1,050,097.

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To all whom it may concern:

Be it known that I, JOSEPH BOERO, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented a new and useful Improvement in Stay-Bolts for Boilers, of which the following is a description.

This invention relates to boilers and furnaces, and particularly to stay-bolts for securing together the fire-box plate and the outer shell of the boiler.

Among the objects of my invention may be noted the following: to provide a stay-bolt which cannot be corroded and thereby destroyed during the use of the boiler; to provide a stay-bolt which, when fractured will act as a tell-tale and will not empty the contents of the boiler into the furnace; and to provide means by which the bolt may be securely fastened or connected to the fire-box plate without riveting, etc.

In order that my invention may be clearly understood, I have provided drawings wherein—

Figure 1 is a sectional elevation showing the manner in which my stay-bolt is applied in use; Fig. 2 is an elevation of the inside of Fig. 1; Fig. 3 is a longitudinal central section of my stay-bolt; Fig. 4 is a section on the line 4—4 of Fig. 3; Fig. 5 is a view similar to Fig. 1, showing the operation of the device in case the bolt is fractured; Fig. 6 is an elevation of the plug or wedge; and Fig. 7 is a view similar to Fig. 6 showing another form of plug.

Primarily, it should be understood that the usual practice in connection with bolting together the fire-box and outer shell of the boiler is to employ a double headed bolt or a bolt which, after it is screwed or driven in, has its end overturned so as to produce a head or rivet on the inner side of the fire-box plate. This is objectionable for many reasons, among which may be mentioned that, after a certain length of time, the metal of the bolt exposed to the fire becomes eaten away by the corrosive action of the products of combustion which produce acids exceedingly injurious to metals of which the bolts are usually made. The bolt-head and its body are thereby gradually eaten away, making the bolt loose and the fire-box leak. Furthermore, in case of accident, resulting in fracture of the body of the bolt within the boiler, water in the latter, in case the

bolt used be hollow, will be admitted to the fire-box which, of course, is objectionable for obvious reasons.

With my invention the foregoing objections are completely overcome and numerous advantages are obtained; and in order that the details of my invention may be clearly understood, reference is had to the accompanying drawings wherein:

The numeral 1 indicates the back of the fire-box, 2 the outer shell of the boiler, 3 the water space, 4 the body of the bolt passing through the water space, which bolt-body may be threaded throughout its length or only at its inner end 5 and outer end 6 as shown in the several drawings, the latter being the preferred form. The body of the bolt is bored centrally from end to end as at 7, and at its outer end is provided with a head 8, the inner surface of which bears tightly against the outer surface of the outer shell 2. The body of the bolt is usually made of wrought iron and when properly inserted assumes the relative position shown in Figs. 1 and 5. Instead of employing a head or rivet at the inner end of the bolt, I eliminate the head completely, thus avoiding the accumulation of products of combustion about the inner end of the bolt and consequently eliminating the possibility of corrosive action of said products of combustion. This also gives a smooth surface to the fire-box which is desirable.

In order to firmly set the inner end of the bolt in the plate of the fire-box, I employ a plug indicated by 9 which may be either solid, as shown in Fig. 6, or centrally bored as indicated at 10 by the dotted lines in Fig. 7. This plug is made of a much harder metal such, for example, as steel and is in the form of a wedge with an inner reduced and rounded end 11. The plug is driven into the bore at the inner end of the bolt with considerable force, resulting in spreading the metal of the end of the bolt and in binding and, so to speak, forging together the screw threads of the inner end of the bolt and the metal of the plate of the fire-box. This condition is illustrated in Fig. 3. To remove the plug, in the event it is desired to remove the bolt for any reason, a metal rod is driven through the bore from the outer end of the bolt until it engages the inner end of the plug, whereupon a heavy blow will drive

the plug from its seat, thus making it possible to remove the bolt in the ordinary manner.

By plugging the inner end of the bolt, as described, if the body of the bolt becomes fractured sufficiently to permit the water in the jacket to enter the bore of the bolt, the said bore will immediately act as a tell-tale since the water will be projected through the outer end of the bolt. The presence of the plug in the inner end of the bolt prevents the water being injected into the fire-box, this being an important feature of my invention. The plug, however, may be bored, as shown in Fig. 7; but, since said bore is considerably less in diameter than the bore of the bolt, the latter will act as a tell-tale just the same and while water may drip through the bore of the plug into the fire-box, it will not be to such an extent as to be objectionable. By boring the plug as noted, greater elasticity of action is permitted between the plug and the end of the bolt which, in some instances, may be preferable, since liability to fracture the bolt at its inner screw threaded end is avoided.

In view of the foregoing description, a detailed statement of the mode of operation seems to be unnecessary; but, it may be noted that the important features of the invention are the elimination of the head on the inner end of the bolt, the employment of a plug to securely fasten the bolt to the plate of the furnace and make a

water-tight joint, and the construction by which a tell-tale is produced to warn the fireman of accident.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In combination with the water-jacket of a furnace, a hollow bolt having a screw-threaded, unheaded inner end, and a plug for coöperation with the inner end of the bolt, said plug being tapered so that when driven into the end of the bolt it will force the end of the same into firm engagement with the metal of the water-jacket.

2. In combination with the water-jacket of a furnace, a tubular bolt having its outer end headed and its inner end unheaded, and a plug driven into the inner end of said bolt to prevent water leaking into the fire-box in case the body of the bolt within the water-jacket becomes fractured.

3. A stay-bolt for furnaces having one end screw-threaded and headed and its other end screw-threaded and unheaded, said bolt being bored from end to end, in combination with a tapered plug coöperating with the unheaded end of the bolt and centered in said bore.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH BOERO.

Witnesses:

BLANCHE DUCROISET,
E. E. GAUCHE.