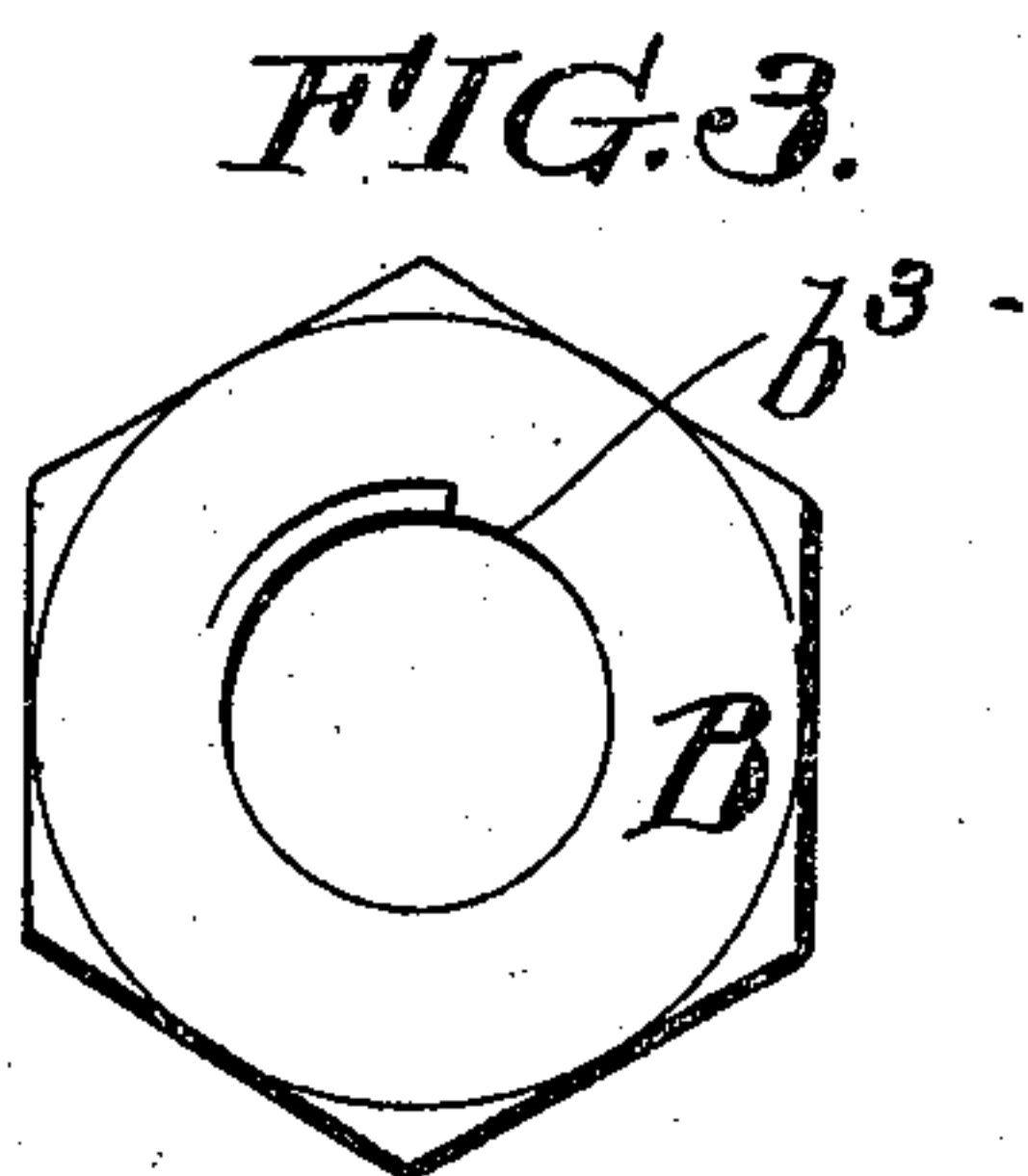
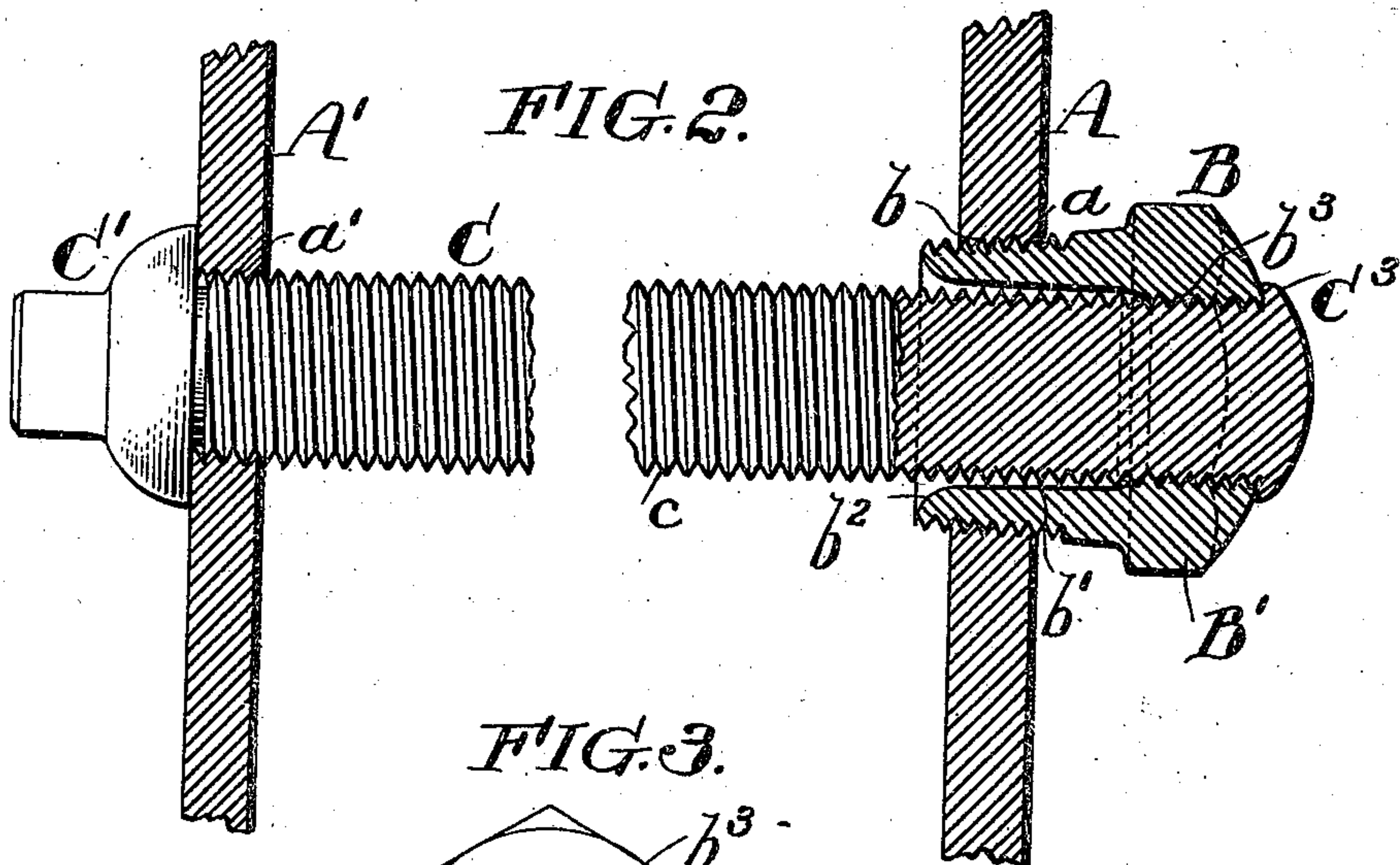
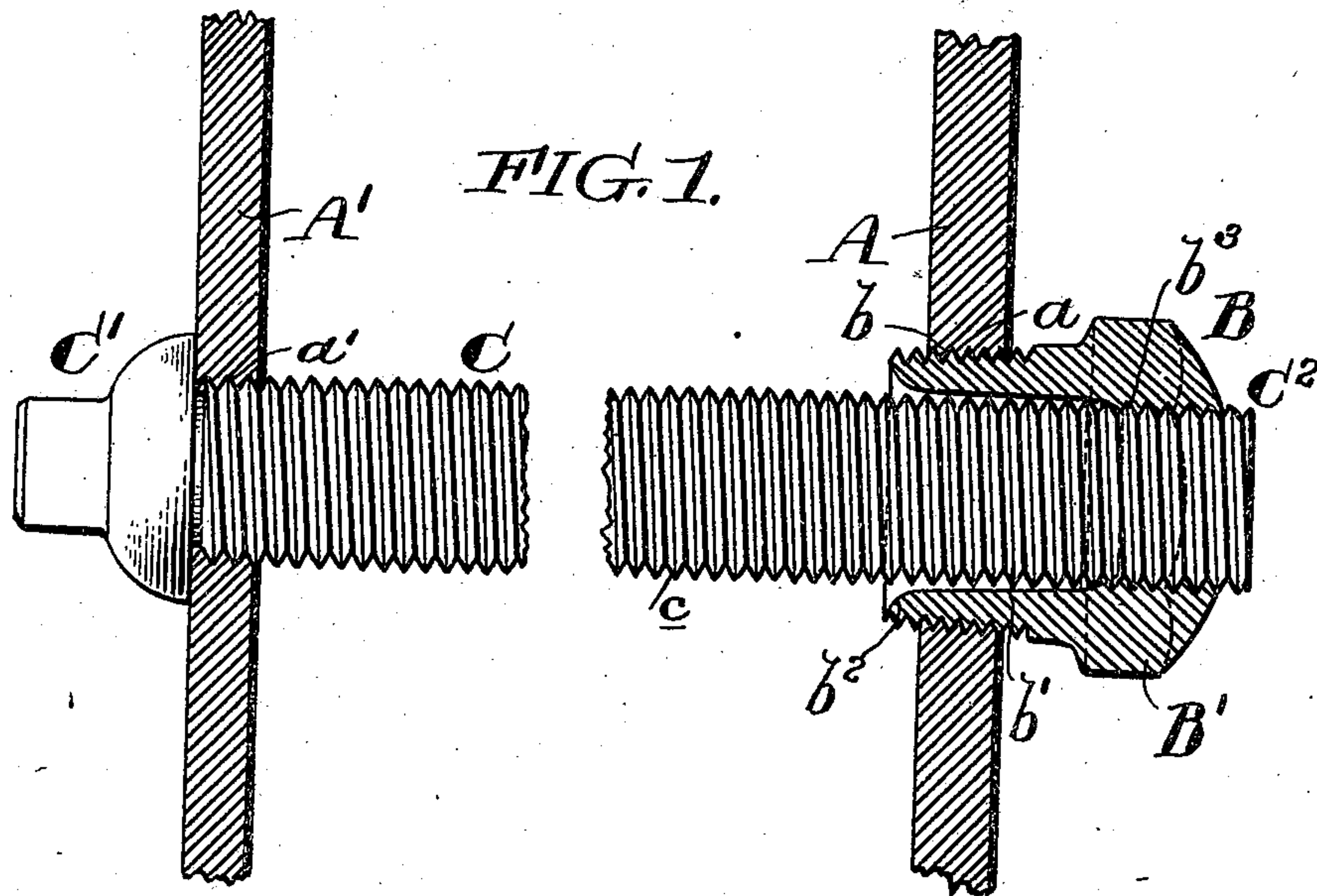


(No Model.)

J. NIXON.
STAY BOLT.

No. 502,827.

Patented Aug. 8, 1893.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JOSEPH NIXON, OF ALTOONA, PENNSYLVANIA.

STAY-BOLT.

SPECIFICATION forming part of Letters Patent No. 502,827, dated August 8, 1893.

Application filed February 21, 1893. Serial No. 463,208. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH NIXON, a citizen of the United States, residing at Altoona, in the county of Blair, in the State of Pennsylvania, have invented a certain new and useful Improvement in Stay-Bolts, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a mode of securing stay bolts, particularly in steam boilers, and to a sleeve, into which the bolt is secured in such a manner that the breakage of bolts and the danger resulting therefrom are greatly lessened, if not entirely overcome. It is well known that stay bolts, particularly the short ones used to stay the furnace walls of boilers, are very apt to become fractured, because of the great strains to which they are exposed on account of the unequal expansion of the walls in which they are secured, and because these bolts are short, and cannot give and accommodate themselves to the varying positions of the walls as they expand. These fractures in the stay bolts, when such occur, are very often close to the boiler walls, as the bolt is bent at that point over the sharp edge of the boiler walls in which the bolts are secured, and are from such position, very difficult to locate and so a bolt when broken is often not removed when it should be. These difficulties I overcome by securing the stay bolt on one side, so that its support is independent of and preferably outside of the boiler shell, allowing a longer bolt to be used, and forming this support so as to give the bolt a support slightly rounded for some portion of its length so that it will not be bent sharply at any one point. This support is preferably made so that it will break before the bolt, if very excessive strains are experienced, which, on account of the breakage on the outside of the boiler wall and from the construction of the bolt support does not impair the strength of the boiler as the bolt itself is intact, and the slight leak occasioned, simply serves to warn the engineer that the bolt support must be replaced.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of a stay bolt

arranged according to my invention. Fig. 2 is a similar view showing the end of the bolt riveted down on the sleeve, and Fig. 3 is an end view of the stay bolt sleeve or support.

A and A' are respectively the outer and inner walls of a boiler and have holes *a*, *a'* opposite each other as usual, and threaded as shown at *c* and having a head C'.

B, represents a support or sleeve for the boiler stay bolt C. As shown, the sleeve B has a head B', preferably made polygonal, so as to afford a grip for a wrench or like instrument, by which the sleeve is turned, and has a barrel portion as *b'*. The barrel portion *b'* is threaded at *b* to screw into the bolt *a* in the wall A and is preferably tapered as shown to make a tight fit. The inside of the barrel is of such a size, that at its inner end near the contracted threaded portion *b³*, the bolt C fits neatly into the sleeve; from there outwardly, the walls are very slightly beveled and end in a flaring mouth at *b²* thus affording a bearing for the bolt C for a considerable portion of its length, and in case of strains, the bolt is bent over an extended curved surface and fracture is less likely to occur.

In practice the sleeve B is first screwed into the outer wall A. Then the hole *a'* in the wall A' and the hole *b³* in the sleeve B are both tapped at one time and with the same tool and then the bolt C is screwed through the wall A' into the head B' of the sleeve which lies outside of the plane of the wall A, whereby a relatively longer bolt C may be used, and the head of the bolt may then be riveted down on the sleeve, as shown at C³.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of securing stay bolts in boilers which consists in forming holes *a*, *a'* opposite to each other in the sheets to be secured together, screwing a sleeve B in the hole *a* in one of the sheets, then tapping the hole *a'* in the other sheet and a hole *b³* in the sleeve at the same time and with the same tool, and then screwing a bolt in the said holes *a'* and *b³*.

2. A stay bolt sleeve B having an external thread *b* a barrel *b'* adapted to fit over the threads of the bolt and provided with a flared mouth *b²* and a contracted head *b³* adapted to be threaded to engage the bolt.

3. A stay bolt sleeve B having an external tapered thread b a barrel b' adapted to fit over the threads of the bolt and provided with a flared mouth b^2 and a contracted head b^3 adapted to be threaded to engage the bolt.

4. The combination with plates A, A' of a boiler of a sleeve B screwing into the outer plate and having a flaring mouth b^2 adapted to clear the bolt and a bolt C screwing into the plate A' and into the sleeve B.

5. The combination with plates A, A' of a boiler of a sleeve B screwing into the outer plate and having a flaring mouth b^2 adapted to clear the bolt and a bolt C screwing into the plate A' and into the sleeve B at a point outside of the plane of the plate A.

6. The combination with plates A, A' of a

boiler of a sleeve B screwing into the outer plate and formed with a barrel b' adapted to fit neatly over the bolt, a flared mouth b^2 and a threaded head b^3 and a bolt C screwing into the plate A' and into the head b^3 of the sleeve.

7. The combination with plates A, A' of a boiler of a tapered sleeve B screwing into the outer plate and formed with a barrel b' adapted to fit neatly over the bolt, a flared mouth b^2 and a threaded head b^3 and a bolt C screwing into the plate A' and into the head b^3 of the sleeve.

JOSEPH NIXON.

Witnesses:

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