O. JOHNSON AND P. NORDANG.

IRON OR STEEL PLATE TIGHTENER.

APPLICATION FILED SEPT. 25, 1919.

1,434,345. Patented Oct. 31, 1922.

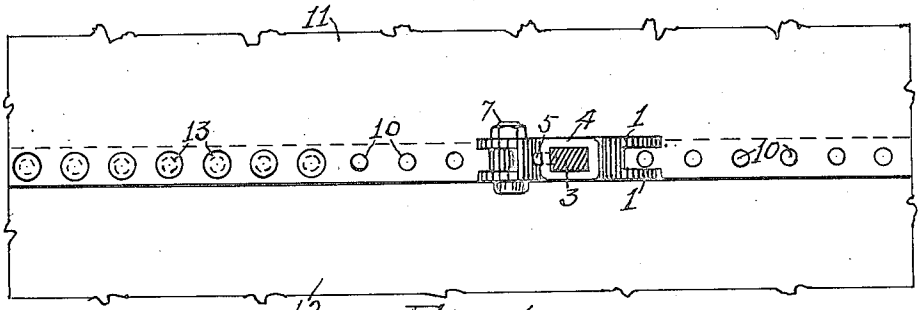


Fig. 1.

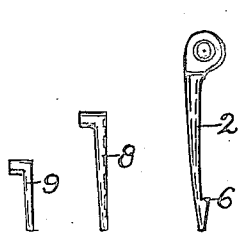


Fig. 4.

Fig. 2.

Fig. 5.

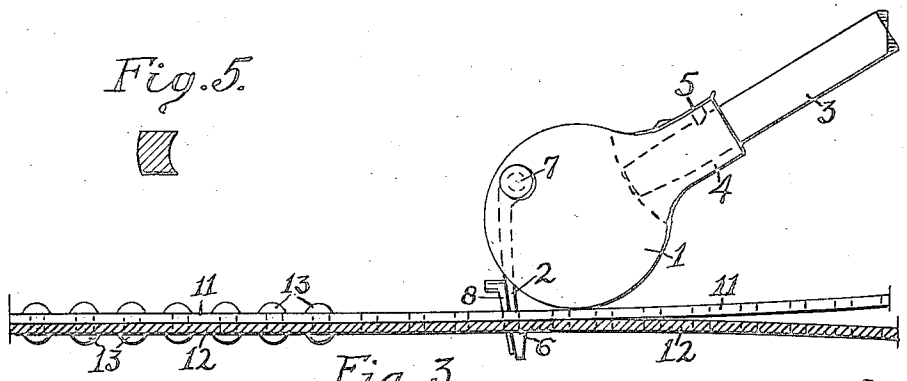


Fig. 3.

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UNITED STATES PATENT OFFICE.

OLE JOHNSON AND PETER NORDANG, OF TACOMA, WASHINGTON.

IRON OR STEEL PLATE TIGHTENER.

Application filed September 25, 1919. Serial No. 326,370.

To all whom it may concern:

Be it known that we, OLE JOHNSON and PETER NORDANG, each a citizen of the United States, residing at the city of Tacoma, in the county of Pierce and State of Washington, have jointly invented a new and useful Improvement in Iron or Steel Plate Tighteners, of which the following is a specification.

This invention relates to devices for tightening iron or steel plates in constructing ships, boilers, tanks and similar structures in which heavy iron or steel plates are used. The objects of our invention are: first; to provide a more rapid and effective means for tightening heavy metal plates preparatory to riveting the plates together; and second, to make a saving of labor and material in performing this work.

We attain these objects by means of the device or tool illustrated in the accompanying drawing in which:—

Figure 1 is a partial top or face view of two heavy metal plates showing the edges partly riveted together and our invention in use thereon; Figure 2 is a side view of Figure 1, showing the application of our invention preparatory to tightening the plates. Figure 3 is similar to Figure 2 showing the metal plates drawn tightly together preparatory to being riveted permanently in place. Figure 4 is a detached view of the draw-hook of our new invention and of wedges to be used in making the hook secure within the rivet holes. Figure 5 is a cross section through one of the wedge-filling members showing the recessed or concave face therein.

Similar numerals refer to similar parts in the several views.

In constructing ships, barges, tanks, and other large structures in which heavy metal plates are used, it is necessary that they be made to fit close and smoothly at the adjoining edges before being riveted together. It often occurs that the plates are slightly bent or kinked in places and the defects are to be made smooth and true in order that the joints may be water and air tight.

Heretofore in building structures of this kind, the heavy metal plates have been drawn together by inserting bolts into the rivet holes, preceding the riveters. The nuts are then screwed on to the bolts till the plates are drawn tight, after which the riveter follows up with the work of riveting the plates together. The bolts are then removed and reinserted in the holes farther along and the work thus continues. This is a slow, tedious process that requires workmen on each side of the plates. The bolts often have to be forced in and out of the holes and the threads are thus often so bruised or stripped that they have to be sent to the shop to have the threads recut, which requires more time and labor. In addition to this, the plates often have to be hammered to smooth out the kinks that prevent a tight joint.

With our invention this slow and tedious work can be done more rapidly and easily. The invention is a simple device or tool comprising a duplex cam with a draw-hook between and a lever arm of suitable length. The duplex lever cam is made of two disks 1—1, with a draw-hook 2 mounted between at a suitable angle with the lever arm 3. The disks may be round or elliptical in form as may best secure the most power in application. The dimensions are designed to be varied according to the thickness of the plates and the sizes of the rivets. The disks are to be made of annealed iron or steel and are held united by the lever arm extension 4, which may be extended into a fixed lever arm, but preferably as shown with a lever arm socket and a spring actuated catch 5 whereby the lever arm 3 may be attached and detached at the will of the operator. This will allow the use of several levers varying in length as the work may require. It will also allow each lever to be used on different sizes of the duplex cam as necessity may require.

The draw-hook 2 is designed to be made of high tension steel with a hook 6 of hardened tool steel. The shoulder of the hook is made to incline slightly upward so that its outer edge will first contact the metal plates and thus take a grip on the same that will prevent its slipping off. The hook 2 is securely suspended between the disks of the duplex cam by the pivot bolt 7.

The operation of the invention is clearly shown in Figures 1, 2 and 3. The hook 2 is inserted into registering rivet holes 10 wherever it is necessary for the plates 11 and 12 to be drawn tight together for riveting. This is fully illustrated in Figures 2 and 3. The wedge 8 or 9 is inserted back of the hook 2 to insure absolute safety to the

grip of the hook 6. The wedges 8 or 9 are to be used where the plates are stiff and hard to draw together. The wedge constitutes a filler between the shank of the draw hook and the wall of the opening through which the shank passes so that the shoulder or hook end of the draw-hook which grips the plate will be held in gripping position and prevented from slipping out of gripping contact with the plate. This filler also makes it possible for the draw-hook to swing free from contact with the walls of the openings in the plates when the filler is removed and thus the disengagement and withdrawal of the draw-hook is materially facilitated. As the plates are drawn tight and smooth the rivets 13 are put in place and the joining of the plates 11 and 12 is completed.

It is to be observed the hook 2 can be inserted in each hole and the plates sprung and drawn smooth where necessary and thus save much hammering of the plates to secure this result. One operator with our newly invented device can attend a crew of riveters on each joint where heretofore a force of several workmen was required. The invention can be used in each hole adjacent to the one being riveted or at wider intervals as the work may require. It is obvious that with our invention, the work of riveting a joint will progress much more rapidly and with a marked saving of time, labor and material.

It is to be further observed that the hook 2 is slightly curved toward the point and rounded in form in order to be easily inserted and adjusted within the rivet holes. The hooks are also designed to be of any length whereby the drawing power of the cam will be increased. It is designed to provide each duplex cam with several draw hooks of different lengths and sizes to fit the various needs. It is also to be noted the wedges 8 and 9 are designed to be concave on the face side in order to better fit the hook 2.

Again it will be observed that with the duplex cam with the draw hook pivotally mounted between and in line with the lever arm, the device is preferably balanced and the utmost force can be applied thereto with safety. This is due largely to the fact that the jaws have a bearing on the plate at opposite or both sides of the line of pull of the draw-hook on the plates and thus any tendency of the draw hook or the cam to tilt or turn sideways under heavy tension or strain is prevented or overcome.

Having described our invention, we claim:—

1. A plate tightener for riveting plate joints comprising a draw-hook having a shoulder on one side at its plate engaging end to engage one of two plates through rivet holes in which it is passed, a cam to which the draw-hook is attached, and a lever for operating the cam, the cam and draw-hook being disposed in relation to each other to bear against the plates to draw them together in actuation of the cam, and the cam formed with bearing surfaces located substantially on opposite sides of the line of pull of the draw-hook.

2. A plate tightener for riveting plate joints comprising a draw-hook having a shoulder at its plate engaging end to engage one of two plates through rivet holes in which it is passed, said shoulder having an upwardly inclined portion to adapt the outer edge of the shoulder to first engage the plate with which it contacts, a cam to which the draw-hook is attached, and means for operating the cam.

3. A plate tightener for riveting plate joints comprising a draw-hook having a shoulder at its plate engaging end to engage one of two plates through rivet holes in which it is passed, a filler member associated with the draw-hook to hold its shoulder in gripping engagement with one of the plates to be riveted, said draw-hook and filler member being formed one with a recess and the other with a corresponding portion to fit in the recess, a cam to which the draw-hook is attached, and means for operating the cam.

4. A plate tightener for riveting plate joints comprising a draw-hook having a shoulder at its plate engaging end to engage one of two plates through rivet holes in which it passes, a cam formed with two bearing surfaces located substantially on opposite sides of the line of pull of the draw-hook, said draw-hook being pivotally attached to the cam, a lever for operating the cam, and a filler member associated with the draw-hook to hold its shoulder in gripping engagement with one of the plates to be riveted.

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