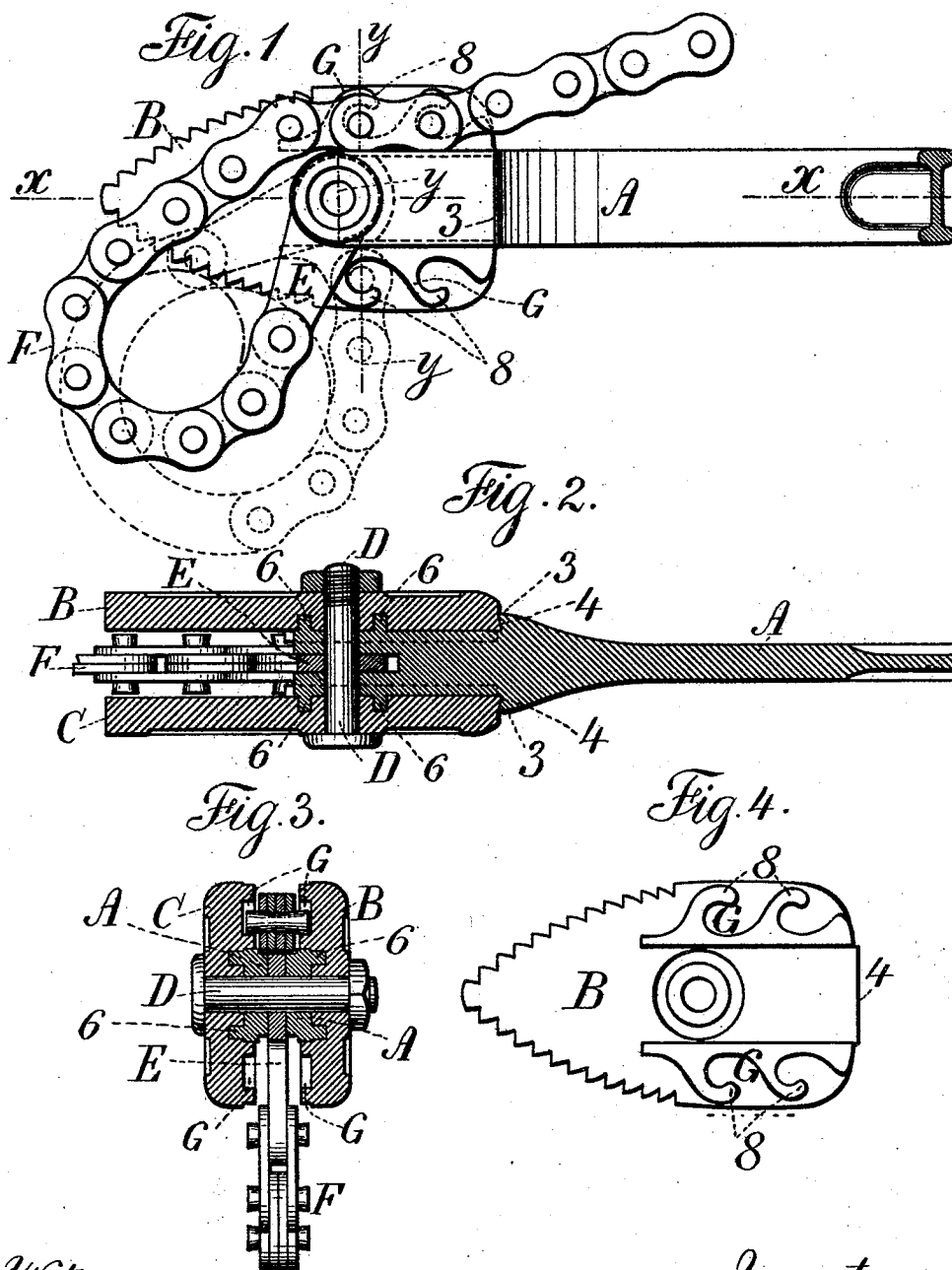


(No Model.)

J. C. BOOTH & W. C. REDFIELD.
PIPE WRENCH.

No. 499,508.

Patented June 13, 1893.



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PIPE-WRENCH.

SPECIFICATION forming part of Letters Patent No. 499,508, dated June 13, 1893.

Application filed January 11, 1893. Serial No. 458,001. (No model.)

To all whom it may concern:

Be it known that we, JOHN C. BOOTH and WILLIAM C. REDFIELD, citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Pipe-Wrenches, of which the following is a specification.

Pipe wrenches or tongs have heretofore been made in which there are two jaws, one at each side of the handle, the jaws tapering or being heart-shaped with teeth on the edges, and a chain has been fastened at one end between the jaws and the links have been capable of connection between the respective jaws, so that after the chain has been passed around the pipe the free portion can be temporarily held by interlocking projections and the leverage of the handle causes the chain to tighten and the teeth upon the jaws to press upon the metal of the pipe. In pipe wrenches of this character the jaws are exposed to a compound strain, the leverage of the handle tending to turn such handle upon the bolt or rivet connecting the jaws and handle, and at the same time the pressure of the jaws against the pipe tends to drive the jaws back upon the handle. Wrenches of this character are often exposed to the most severe usage and under circumstances where the parts are unusually liable to be injured, either by the direct strain or by the carelessness of the workmen, and should the wrench break or its parts become loosened or disconnected, the workman is inconvenienced and there is often a risk of personal injury or loss of life.

The object of the present invention is to simplify the construction of the wrench, to increase the bearing surface of the handle against the respective jaws and thereby to spread the strain upon a greater extent of surface and to lessen the risk of the surfaces becoming upset, worn or abraded by the pressure and hence the jaws becoming loose upon the handle, and in addition to this, the hooks upon the inner faces of the jaws, which receive the pins of the chain, are not only extended backwardly, as in the Patent No. 298,442, granted May 13, 1884, to W. H. Brock, but such hooks are turned inwardly toward the head of the lever handle, so that there is

no risk of the chain becoming unhooked when in use, even under the most disadvantageous circumstances resulting from inverting the wrench so that the chain is hooked up from below. With the form of hook represented in the said Patent No. 298,442, the tension upon the chain tends to draw the pivot pins of the links into the hooking projections upon the inner faces of the jaws adjacent to the head of the handle lever, but when the chain has been hooked up from below and when the wrench is being moved backwardly to take a fresh hold, the pins of the chain may drop out from these hook-shaped projections because they are not turned up toward the head of the handle, and such chain may slip away from the jaws and fail to perform its duty of holding the pipe, and the entire wrench may disconnect from the pipe at the risk of personal injury to the workman.

In the drawings, Figure 1 is an elevation of the chain, the handle and the interior of one of the jaws, the other jaw being removed. Fig. 2 is a section at the line *xx* longitudinally of the handle. Fig. 3 is a section at the line *yy*, and Fig. 4 shows the interior face of one of the jaws.

The handle A is of suitable size and shape and it passes in between the two jaws B and C, and there is a cross bolt D or a rivet that passes through the jaws and handle and through the swinging link E at one end of the chain F, which link is shown as within a slot at the end of the handle, and this chain F is made of links somewhat similar to those shown in the Patent No. 254,862, granted March 14, 1882, to W. H. Brock, but we prefer to make use of similar plate links, there being two links placed together to form each of the inner links of the chain, and the cross pins or pivots of the chain have projecting heads to hook upon the hook-shaped projections on the inner faces of the jaws. The inner faces of the jaws B and C are grooved longitudinally to receive between them the head of the handle in a manner similar to that represented in the Patent No. 298,442, but if these parts only were made use of in connecting the jaws to the handle, the head of the handle might work loose between the jaws in

consequence of the metal being upset, worn or abraded under the heavy strain to which the parts are sometimes exposed, especially in consequence of the comparatively shallow recess longitudinally of the jaws into which the head of the handle is received. We avoid the aforesaid risk of the metallic surfaces that are in contact with each other becoming injured by the pressure and the parts becoming loose, by providing upon the handle A the shoulders 3 that come against the bottom ends of the respective jaws, and these shoulders 3 not only prevent the jaws from rotating upon the cross bolt D, but the parts are tightened up in the most reliable manner by making the surfaces 4 at the ends of the jaws slightly beveled and by upsetting the shoulders 3 against such slightly beveled surfaces 4 and thereby riveting up the parts in such a manner as to effectually prevent looseness and hold the jaws to the handle; this desirable object is furthermore attained by forming upon the handle at each side of the head a circular bearing lug 6 which is easily fitted into a recess in the inner faces of the jaws, because such bearing lugs being circular, the recess in each jaw is easily bored for the lug to fit very tightly, and these circular bearing lugs 6 relieve the cross bolt D almost entirely from strain except that due to the tension of the chain, and they also receive the end thrust of the pipe or rod against the teeth of the jaw, tending to push the jaws back upon the handle, and these circular bearings act with the shoulders 3 to so firmly connect the jaws and handle that they cannot be separated by the severe strain to which the wrench is sometimes exposed. By making the round projecting lugs 6 in the form of rings and channeling the interior surfaces of the jaws for these annular ribs or rings, as illustrated in Figs. 2, 3 and 4, the extent of bearing surface is still further increased and the risk of the parts becoming loose is reduced to a minimum.

Instead of making the hook-shaped lugs G in the form represented in the said Patent No. 298,442, we turn the hook-shaped ends of the lugs backwardly or toward the sides of the handle, as shown at 8, Figs. 1 and 4. Hence the round projecting ends of the pivot pins upon the chain will be received by these hooking ends of the lugs so as not to drop off. This construction is especially advantageous when the hooks G, below the handle, receive the pin of that portion of the chain which may hang down below the rest of the wrench, as illustrated by dotted lines in Fig. 1, because in this position the links of the chain are not liable to slip off or become detached from the hook-shaped lugs, and the chain is thereby reliably connected with the hooks upon the jaws.

It is to be understood that in the use of this wrench for pipes or rods it sometimes happens that it is most convenient to bring the wrench against the pipe and pass the chain

over and down below the pipe and hook it up between the jaws, and in this position with our present improvements the wrench can be manipulated without the risk of the chain becoming detached from the pipe, whereas in the said Patent No. 298,442, the projecting ends of the pivot pins might slip off the downward inclined ends of the lugs and thus the chain become disconnected from the pipe and the hold thereof loosened.

We have represented a cross bolt D as passing through the two jaws, and the head of the handle. This is a convenience in consequence of the link E of the chain passing into the slot at the end of the handle and through which swinging link the cross bolt D also passes, but it will be understood that a rivet might take the place of the cross bolt D, or that a screw may be employed passing through one jaw, through the head of the handle and the swinging link and into the other jaw, so as to screw the parts together when this form of connecting device is preferred. The chain might be fastened at one end by a separate bolt, as in Patent No. 298,442.

We claim as our invention—

1. The combination with the handle having the shoulders 3, of the jaws B C and the cross bolt or attachment D, the swinging link E passing into a slot at the head of the handle and having an eye for the cross bolt, the chain and hooks upon the inner faces of the jaws for receiving the heads of the rivets upon the chain, substantially as set forth.

2. The combination with the handle A having the shoulders 3, of the jaws B C, one at each side of the handle, a bolt or rivet passing across through the jaws and through the head of the handle, the back ends of the jaws being beveled and setting against the shoulders 3 and the jaws being firmly held in position by spreading or upsetting the shoulders 3 against the beveled surfaces of the back ends of the jaws, substantially as set forth.

3. The combination with the handle having the shoulders 3, of the jaws B and C, there being a round projection at each side of the handle head entering a correspondingly shaped recess in the inner face of each jaw, the back ends of the jaw setting against the shoulders 3, a chain connected at one end between the jaws and interlocking projections for temporarily holding the free portion of the chain, and a bolt or rivet passing through the jaws, substantially as set forth.

4. The combination with the jaws, each having a longitudinal recess and an annular recess upon its inner face, of a handle having annular projections at opposite sides of its head passing into the annular recesses in the inner faces of the jaws, and setting into the longitudinal recesses, and a cross bolt or connection and a chain fastened at one end between the jaws, and interlocking projections to temporarily hold the free portion of the chain, substantially as set forth.

5. The combination with the jaws each hav-

ing an annular recess upon its inner face, of a handle having annular projections at opposite sides of its head passing into the annular recesses in the inner faces of the jaws, and shoulders 3 at the back ends of the jaws, a cross bolt or connection and a chain fastened at one end between the jaws and interlocking projections for temporarily holding the free portion of the chain, substantially as set forth.

6. The combination in a pipe wrench, of jaws recessed longitudinally and each having a circular recess, a handle having a head adapted to pass into the longitudinal recesses and projections to pass into the circular recesses, and a cross bolt or connection passing through the jaws, substantially as set forth.

7. The combination in a pipe wrench of jaws recessed longitudinally and each having a circular recess, a handle having a head adapted to pass into the longitudinal recesses, and projections to pass into the circular recesses, shoulders upon the handle to come against the back ends of the jaws, and a cross bolt or connection passing through the jaws, substantially as set forth.

8. The combination in a pipe wrench, of a handle having an end that is slotted longitudinally, a chain having a link passing into the slot of the handle, jaws with serrated edges at each side of the handle head, projections upon the handle head entering recesses in the inner faces of the jaws, and shoulders upon the handle coming adjacent to the back edges of the jaws, substantially as set forth.

9. The combination in a pipe wrench, of a handle having an end that is slotted longitudinally, a chain having a link passing into

the slot of the handle, jaws with serrated edges at each side of the handle head, projections upon the handle head entering recesses in the inner faces of the jaws, and shoulders upon the handle and receiving the beveled back ends of the jaws, the shoulders setting tightly over and upon such beveled back ends, substantially as set forth.

10. The combination with the handle and chain in a pipe wrench, of jaws permanently fastened on the handle and having upon their inner and opposite faces hook-shaped projections with the ends of the hooks inclined toward the handle for receiving the projections on the chain and preventing them falling away therefrom by gravity substantially as specified.

11. The combination in a pipe wrench of a handle, jaws with projections that interlock with the handle and beveled back ends, there being shoulders upon the handle setting tightly over and upon such beveled back ends of the jaws, a chain connected at one end between the jaws and interlocking projections for temporarily connecting the free portion of the chain, substantially as set forth.

12. The combination in a pipe wrench, of a handle, jaws connected with the handle and having beveled back ends, there being shoulders on the handle setting tightly over and upon such beveled back ends, substantially as specified.

Signed by us this 10th day of January, 1893.

JOHN C. BOOTH.

WILLIAM C. REDFIELD.

Witnesses:

F. G. PITCHER,

JOHN ARMSTRONG.