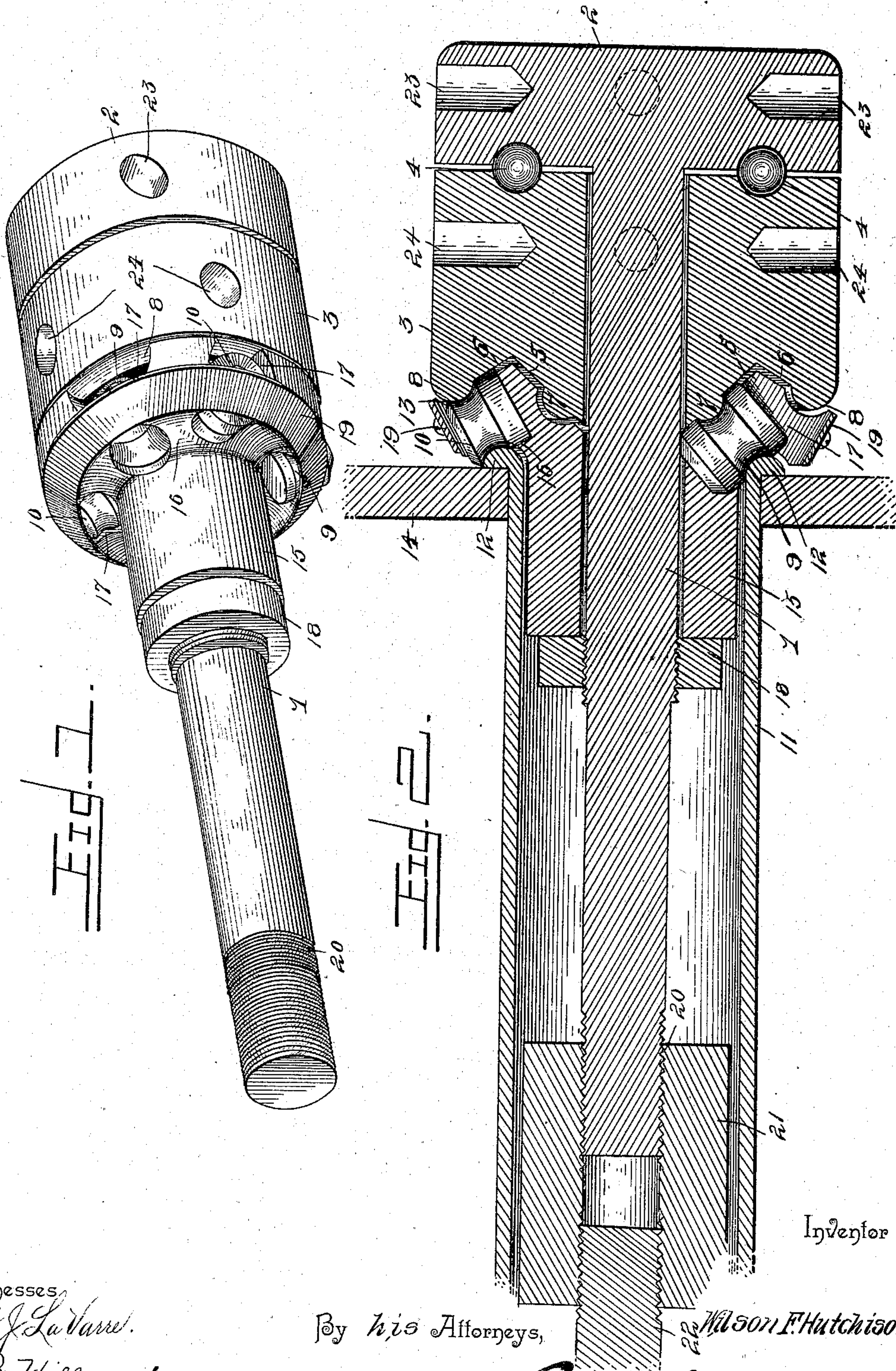


(No Model.)

W. F. HUTCHISON.
FLUE BEADER.

No. 582,064.

Patented May 4, 1897.



Witnesses,
W. J. LaVarre.
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By his Attorneys,

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UNITED STATES PATENT OFFICE.

WILSON F. HUTCHISON, OF SHERMAN, TEXAS, ASSIGNOR OF ONE-FOURTH
TO J. W. HUTCHISON, OF SAME PLACE.

FLUE-BEADER.

SPECIFICATION forming part of Letters Patent No. 582,064, dated May 4, 1897.

Application filed June 12, 1896. Serial No. 595,351. (No model.)

To all whom it may concern:

Be it known that I, WILSON F. HUTCHISON, a citizen of the United States, residing at Sherman, in the county of Grayson and State of Texas, have invented a new and useful Flue-Beader, of which the following is a specification.

This invention relates to means for beading, swaging, or upsetting the ends of boiler flues or tubes after the latter have been placed in position in the boiler-heads, so as to secure a steam-tight joint, a neat finish, and a substantial connection.

The object of the invention is to provide a tool which can be rotated and will successively and gradually turn the projecting end of the tube or flue without unnecessarily straining or disturbing the fibers of the tube to such an extent as to create fracture or weaken the beaded end.

A further purpose of the invention is the construction of a tool which while being rotated can be forcibly and positively advanced to the work so as to insure the beading or upsetting of the flue or tube without requiring any special effort on the part of the workman other than that necessary to rotate the tool, so as to attain the object in view.

With these and other objects in view, which will appear to one skilled in the art as the nature of the invention is understood, the improvement consists of the novel features and combinations of the parts, which hereinafter will be more particularly set forth, illustrated, and finally embodied in the subjoined claims.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a tool constructed in accordance with the principles of this invention for attaining the ends thereof. Fig. 2 is a longitudinal section showing the tool in operative relation.

The tool comprises a stock consisting of a shank 1 and a shoulder 2. A revoluble head 3 is mounted upon the shank 1 and is supported by the shoulder 2, antifriction or ball

bearings 4 being interposed between the shoulder 2 and head 3 to relieve the friction between these parts when they are relatively turned. The outer end of the head 3 is depressed, forming two faces 5 and 6, which stand at an angle relative to each other. A bead 7 is formed on the face 5 and a corresponding bead 8 is provided on the face 6, and these beads 7 and 8 form annular tracks for calking and swaging rollers to travel upon when the tool is in operation.

The swaging-rollers 9 and the calking-rollers 10 are similarly formed and are alternately arranged, the swaging-rollers 9 being placed to travel upon the face 5 and track 7 and the calking-rollers 10 to operate upon the face 6 and track 8. Both sets of rollers have peripheral grooves intermediate of their ends which correspond to the form of the track against which the rollers bear, and these grooves are semicircular, or nearly so, to correspond to the beaded or upset end of the boiler tube or flue. The swaging-rollers 9 start or give the initial bend to the projecting end of the flue or tube 11, and the calking-rollers give the finishing turn to the bead 12 and are formed with a cutting edge 13 to remove any surplus metal and to insure a firm engagement between the bead 12 and the portion of the boiler-head 14 bordering upon the opening in which the flue or tube 11 is fitted.

A retainer 15 is rotatably mounted upon the outer end of the shank 1, and its inner end is flanged, as shown at 16, and is provided with a series of pockets or openings 17, in which the several rollers are fitted and held a proper distance apart. The pockets or openings 17 are formed so as to adapt them to the different positions of the rollers and so as to admit of the latter rotating freely about their respective axes when the tool is in active operation. A nut 18 is mounted upon a threaded portion of the stem and serves to retain the parts 15 3 and the rollers in proper position. The outer face of the flange 16 is beveled, and a band 19 is secured thereto, so as to retain the rollers in place in their pockets.

The end of the stem 1 opposite the shoulder 2 is threaded, as shown at 20, and is adapted

to enter a coupling 21 on the end of a tie-rod 22, which latter passes through the flue or tube to be beaded, and is secured in place therein in any convenient way, so as to admit of its being readily removed and fitted to another tube or flue in the process of beading the various tubes entering into the formation of a flue and tubular boiler.

The rod 22 being placed in position and secured within a flue or tube, the tool is applied to the end of the said flue or tube and makes a screw-thread connection with the said rod by means of the coupling 21. By turning the stock the tool is advanced, thereby forcing and crowding the rollers 9 and 10 against the projecting end of the tube, said stock being turned in any convenient way, preferably by fitting a rod in one of a series of openings 23, formed at intervals in the shoulder 2. After the rollers have been brought into forcible engagement with the projecting end of the flue the head 3 is rotated, thereby turning the projecting end of the flue. After the head 3 has been rotated once or any required number of times the stock is again turned to advance the rollers to the work, thereby gradually effecting the beading, it being remembered that the head 3 is rotated between each successive advancement of the stock. The head is formed with a series of openings 24, which receive a rod or other implement, by means of which it is rotated, so as to effect the desired end. After the end is completely beaded the tool is removed and fitted to another flue or tube and the operation herein described repeated.

Having thus described the invention, what is claimed as new is—

1. In a tool for beading boiler flues or tubes, the combination of a revoluble head, and swaging and calking rollers alternately arranged and disposed at different angles, whereby one set of rollers starts or gives the initial bend and the other set completes the beading or upsetting, substantially as specified.

2. In a tool for beading boiler tubes or flues, the combination of a revoluble head, swaging-rollers disposed at intervals around the revoluble head to start or give the initial bend to the boiler-flue, and calking-rollers arranged intermediate of the swaging-rollers and at a different angle thereto, and provided with

cutting edges, substantially as and for the purpose set forth.

3. In a tool for beading boiler tubes or flues, the combination of a revoluble head provided with oppositely-inclining faces forming tracks, and rollers adapted to travel upon the said tracks, substantially as and for the purpose set forth.

4. In a tool for beading boiler tubes or flues, the combination of a revoluble head having oppositely-inclining faces, each formed with a bead providing a track, and rollers alternately arranged and disposed to travel upon the said tracks, substantially as and for the purpose set forth.

5. In a tool for beading boiler tubes or flues, the combination of a revoluble head, rollers adapted to travel upon the revoluble head, and a retainer having openings to receive the rollers and hold them in place, substantially as set forth.

6. In a tool for beading boiler tubes or flues, the combination of a revoluble head, rollers obtaining a bearing against the revoluble head, a retainer having openings for receiving and securing the rollers in operative position, and a band secured to the retainer for holding the rollers in place, substantially as set forth.

7. The herein-described tool for beading boiler tubes or flues, consisting of a stock having a shoulder and provided with means to positively advance it to the work, a head revolvably mounted upon the stock and having oppositely-inclining faces provided with annular tracks, antifriction-bearings between the revoluble head and shoulder, swaging and calking rollers having peripheral grooves which receive the annular tracks and which effect the beading or upsetting of the flue or tube, and a retainer formed with a flange having pockets or openings, to receive the aforesaid rollers, substantially in the manner and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILSON F. HUTCHISON.

Witnesses:

JOHN H. SIGGERS,
THEODORE DALTON.