Aug. 18, 1925. 1,550,285

G. S. SHERMAN

APPARATUS FOR TIGHTENING HANDHOLE COVERS

Filed Jan. 31, 1925

Fig. 1.

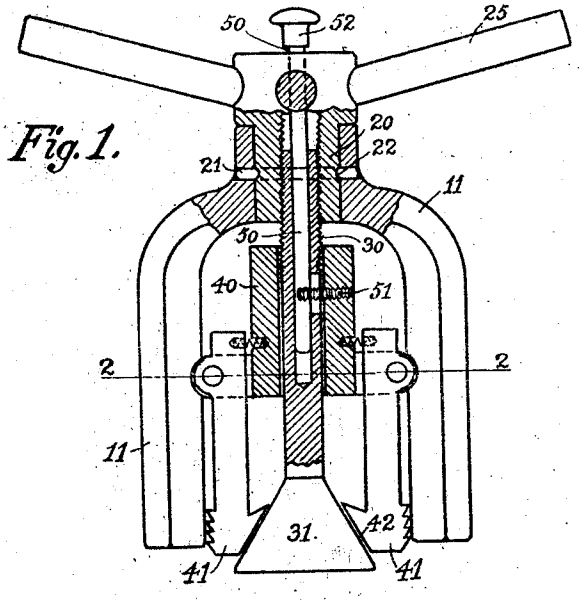


Fig. 4.

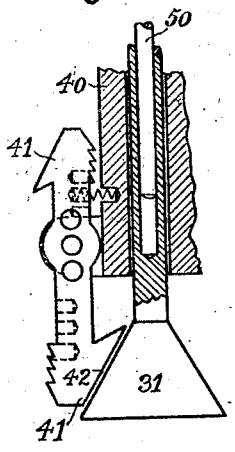


Fig. 2.

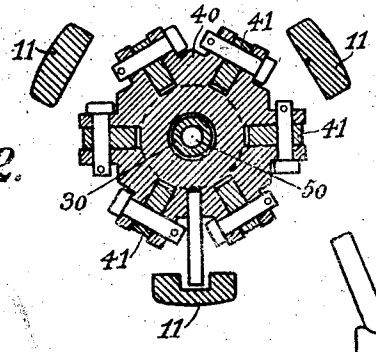
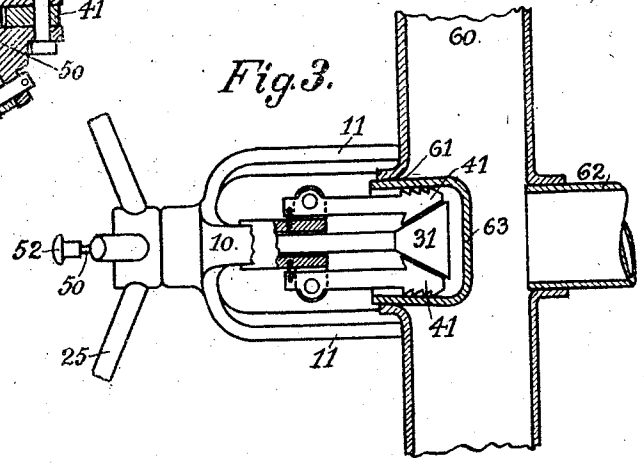


Fig. 3.



INVENTOR
George Sale Sherman.
BY
Edw. Rauhinsky
ATTORNEY

Patented Aug. 18, 1925. 1,550,285

UNITED STATES PATENT OFFICE.

GEORGE SALE SHERMAN, OF WESTBURY, NEW YORK.

APPARATUS FOR TIGHTENING HANDHOLE COVERS.

Application filed January 31, 1925. Serial No. 6,104.

To all whom it may concern:

Be it known that I, GEORGE SALE SHERMAN, a citizen of the United States, residing in Westbury, Long Island, in the county of Nassau, State of New York, have invented certain new and useful Improvements in Apparatus for Tightening Handhole Covers, of which the following is a specification.

My invention relates to hand hole covers, more especially to pressed steel hand hole caps which are inserted in a header or water leg of a boiler, oil still, vat or other device in which tubes are used and has for its object the production of a tool that will easily force into place a cover that will remain tight and to further provide a method of tightening any cover around which leaks appear after pressure is put upon the boiler or vat or the like.

In boilers, superheaters, oil stills, vats or the like using tubular construction, the tubes are usually expanded into one side of a hollow header or water leg and on the opposite walls are a series of holes closed by hand hole covers or caps provided for the purpose of inspection, cleaning or renewing of the tubes. These hand holes are closed either by means of cast iron or dropped forged steel plates held in position by means of bolts and yokes or arches bearing against the outside of the water leg sheet, or may be of pressed sheet steel which are cupped and tapered on the outside and inserted from the inside so that steam pressure tends to make them tighter. These covers or caps are inserted in the holes from the pressure side and tapped with a hammer which usually seats them sufficiently to make them tight; as soon as pressure is put on the boiler the covers become tighter. If by any chance a leak occurs the water leg is struck by a hammer along side the leaking cover to bring the cover straight on its seat. This blow sometimes fractures the water leg sheet between the hand holes. To prevent any possibility of such damage which is not only very costly and always results in the shutting down of the plant, I have designed my apparatus which will draw the cup shaped hand hole covers into place quickly.

The foregoing and other features of my invention will now be described in connection with the accompanying drawings, forming part of this specification in which I have represented my tool in its preferred form, after which I shall point out more particularly in the claims those features which I believe to be new and of my own invention.

Referring to the drawings:

Figure 1 is a side elevation of my tool in part section.

Figure 2 is a section along the line 2—2, Figure 1.

Figure 3 illustrates the method employed for tightening the hand hole cap.

Figure 4 is a detail of my gripping fingers designed to be turned around to take care of a larger or smaller cap.

In the carrying out of my invention I employ a yoke or arch 10 having a plurality of legs 11. In the drawing I have illustrated an arch with three legs but a greater or less number may be employed. Mounted in the arch 10 is a nut 20 free to turn therein and held from sliding out by any means such as pin 21 in the yoke and slot 22 in the periphery of the nut. On the outer end of the nut I provide a hand wheel or handles 25 radially disposed so that the nut can be conveniently turned in the yoke. A screw 30 is provided to operate in the nut and carries on its end a conical head 31. Interposed between the head 31 and the nut 20 I provide a sliding collar 40 which carries a plurality of spring actuated, pivotally mounted, gripping jaws 41. These jaws are provided with cam faces 42 which slide upon the inclined face of the conical head of the screw. The collar 40 is connected with the plunger 50 which slides in a hole in the center of the screw 30 by means of a screw or pin 51. The plunger 50 is provided with a handle 52 on its outer end by means of which the collar 30 may be moved along the screw expanding the gripping jaws as they move along the conical face of the head thereof.

It will be observed that in Figure 4 the gripping jaw 41 may be designed to be turned around. The cam 42 on one end is larger than the cam on the other which relatively increases the range of the jaws in gripping hand hole caps of different sizes.

Referring now to Figure 3 I have shown a diagrammatical section of a header 60 of a boiler, still or the like, showing the hand hole 61 opposite the tube. In carrying out my method a cup shaped cap 63 is placed in the hole from the pressure side of the header and my tool is then placed on the other side so that the legs 11 of the arch

are against the outside of the header straddling the hole. By pushing the handle 52 the jaws 41 are brought into contact with the inside of the cap 63. By turning the hand wheel or handles 25 the screw 30 is drawn into the nut 20 and likewise the conical head forces the jaws 41 to take hold of the cap 63. Any further turning draws the cap tightly into its hole as will be readily understood.

I wish it distinctly understood that my apparatus for tightening hand hole covers herein described and illustrated is in the form in which I desire to construct it and that changes or variations may be made as may be convenient or desirable without departing from the salient features of my invention and I therefore intend the following claims to cover such modifications as naturally fall within the lines of invention.

I claim:

1. A device of the class described comprising in combination; a yoke provided with a plurality of legs; a nut mounted to rotate in the arch of said yoke; a screw adapted to turn in the nut and provided with a cone shaped head; a collar adapted to slide on the screw between the nut and the head, and provided with a plurality of pivotedly mounted, spring actuated gripping jaws, the ends of said jaws adapted to ride on the cone, means to adjust the position of the jaws on the cone, means to turn the nut and thereby draw the gripping jaws outwardly and longitudinally.

2. A device of the class described comprising in combination; a yoke provided with a plurality of legs; a nut mounted to rotate in the yoke; a screw adapted to turn in the nut having a conical head; a sleeve adapted to slide on the screw between the nut and the head, and provided with a plurality of gripping jaws, means to adjust the position of the jaws on the conical head, means to turn the nut and thereby draw the gripping jaws outwardly and longitudinally.

3. A device of the class described comprising in combination; a yoke provided with a rotating nut; a screw adapted to work within the nut and provided with a conical head; means interposed between the conical head and nut for adjustably carrying a pluraliy of gripping jaws, means to turn the nut whereby the jaws are forced outwardly and at the same time moved longitudinally.

4. A device of the class described comprising in combination; a yoke provided with a rotating nut; a screw adapted to work within the nut for reciprocal motion and provided with a conical head; a collar adapted to slide on the screw between the nut and the head, and provided with a plurality of interchangeable gripping jaws adapted to ride upon the cone; means to provide adjustment of the gripping jaws on the conical head, means to draw the cone within the jaws and move the cone and jaws longitudinally.

In testimony whereof I affix my signature.

GEORGE SALE SHERMAN.