(No Model.)

M. CASHIN.

BOILER TUBE EXPANDER.

No. 324,007. Patented Aug. 11, 1885.

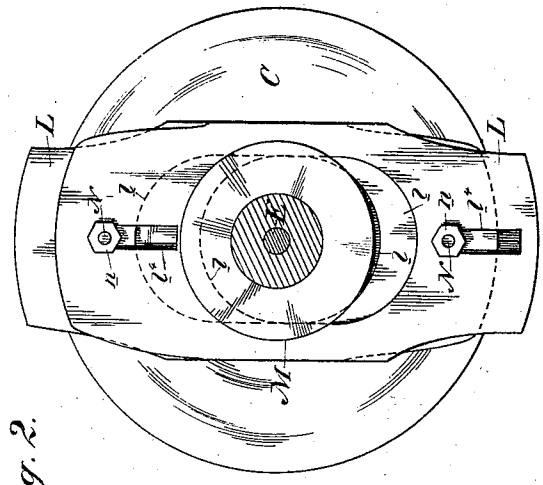


Fig. 2.

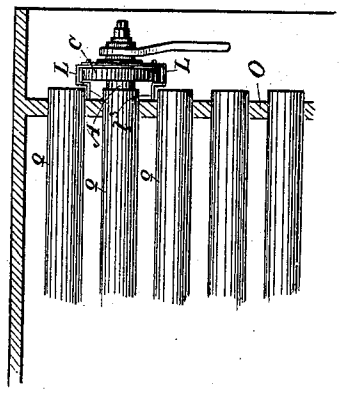


Fig. 3.

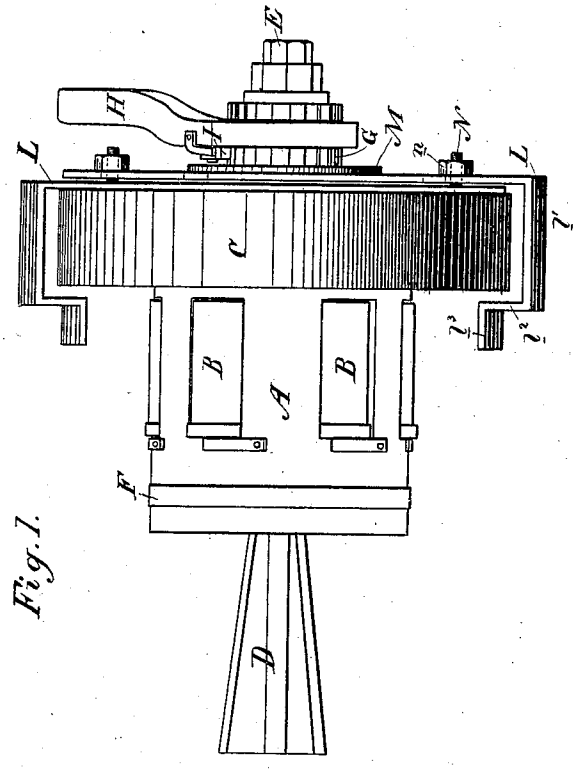


Fig. 1.

Witnesses,
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UNITED STATES PATENT OFFICE.

MICHAEL CASHIN, OF SAN FRANCISCO, CALIFORNIA.

BOILER-TUBE EXPANDER.

SPECIFICATION forming part of Letters Patent No. 324,007, dated August 11, 1885.

Application filed June 15, 1885. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL CASHIN, of the city and county of San Francisco, State of California, have invented an Improvement in Boiler-Tube Expanders; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of expanders for fitting the tube snugly in the tube-sheets of the boiler; and my invention consists in an extensible and contractible guard pivoted on the head or portion of the implement outside the tube, as I shall describe.

In implements of this class a guard, either in the shape of an annular band or of two short arcs or lips, is generally present. The object of the guard is to limit the insertion of the expanding-block of the implement. It bears against the tube-sheet while the rest of the implement is rotated. I have found that both these forms of guards are disadvantageous in confining or limiting the use of the expander. In some boilers the tubes are closer together than in others. An expander provided with a guard of a fixed diameter, while adapted for use on boilers in which the separation of the tubes is such as to permit the guard in being seated against the tube-sheet to avoid the ends of adjacent tubes when the expanding-block is inserted in the tube then to be operated on, is not adapted for use on boilers in which the tubes are separated by a distance less than the diameter of the guard, as in that case the lips of the guard would come in contact with adjacent tubes.

It is the object of my invention to provide a guard adapted to be extended or contracted and set where desired, thus adapting it for use on boilers, no matter what may be the separation of its tubes.

Referring to the accompanying drawings, Figure 1 is a side view of my device. Fig. 2 is an end view of the same. Fig. 3 shows the application of the guard to the tube.

It will be understood that my extensible guard may be used on other implements of this class, though I have herein shown it as applied to that boiler-tube expander for which I filed an application for a patent on the 26th day of August, 1884, and which was allowed on April 20, 1885, the patent based on said application to bear date of the 9th of June, 1885.

For greater clearness I will briefly refer to the main features of this expander. A is the expanding-block, which fits in the tube. B are the rollers on the block for seating the tube. C is the head to which the block is secured and on which its sectors are guided in expanding and contracting. D is the wedge by which the block is expanded. E is the screw by which the wedge is moved longitudinally to expand the block or allow it to contract by means of the spring F. H is the lever, having pawl I, engaging the ratchets G in the hub of the head C, whereby the whole implement is rotated. These are all the main features of the expander.

L is the adjustable guard. It consists of two plates or strips the bodies of which lie one on the other, and are provided with elongated oval slots or apertures, *l*, which encircle the hub of head C. The plates are guided by a fixed disk, M. One end of each plate is bent parallel with the circumference of head C at l', is bent again inwardly behind the head at l^2, and then forwardly at right angles, forming lips l^3. Although I have described these plates as "bending," it is obvious that the various angles may be formed by the proper union of several strips or pieces. In the body of the outer plate are made the elongated slots l^4, on each side of the central slot or aperture. Through these slots project the bolts N, (from the inner plate,) on which are fitted the nuts *n*. Instead of bolts and nuts I may use thumb-screws passing into the head.

The application of the guard is shown in Fig. 3, in which will be seen the tube-sheet O and the projecting ends of the tubes *o*. The block A is inserted in a tube, while the lips l^3 of the guard bear against the tube-sheet. If the tubes are close together, and the lips l^3 would come in contact with adjacent tubes, I loosen the nuts *n* and shorten the diameter of the guard by forcing its lips l^3 closer together, whereby they will avoid the adjacent tubes and will bear on the tube-sheet. The nuts are then tightened up again. The oval slots or apertures in the plates of the guards permit this movement on the hub of the head.

When the tubes are separated by a greater distance, I extend the guard.

The guard remains stationary against the tube-sheet while the rest of the implement is rotated.

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

1. In a boiler-tube expander, an adjustable guard pivoted on the expander, and adapted to bear against the tube-sheet to limit the insertion of the implement into the tube, substantially as and for the purpose herein described.

2. In a boiler-tube expander, a guard pivoted on the expander and adapted to bear against the tube-sheet, said guard being extensible and contractible to adapt it to avoid adjacent tubes, substantially as herein described.

3. In a boiler-tube expander, the extensible and contractible guard L, pivoted on the head or portion of the expander without the tube, and provided with lips l^3 for bearing against the tube-sheet, substantially as herein described.

4. In a boiler-tube expander, and in combination with the head C of the expander, the extensible and contractible guard L, consisting of two plates slotted loosely on the hub of the head, and provided with lips l^3, adapted to bear against the tube-sheet, and a means for fixing the guard where set, substantially as herein described.

5. In a boiler-tube expander, and in combination with the head C, the extensible and contractible guard L, consisting of the plates slotted loosely on the hub of the head, and having slots l^4, and lips l^3 adapted to bear against the tube-sheet, and the bolts N, passing through the slots l^4 from the inner plate, and nuts n for fixing the guard where set, substantially as herein described.

6. In a boiler-tube expander, the head C, and the guide disk M around its hub, in combination with the adjustable guard L, consisting of two plates slotted on the hub and guided by the disk, said plates having lips l^3 for bearing against the tube-sheets, and slots l^4, and the bolts N and nuts n by which the guard is fixed where set, substantially as herein described.

In witness whereof I have hereunto set my hand.

MICHAEL CASHIN.

Witnesses:
THOS. LUNDBLAD,
PAUL CASHIN.