(No Model.)

D. BUSHOR.

FLUE CUTTER.

No. 303,556. Patented Aug. 12, 1884.

Fig. 1.

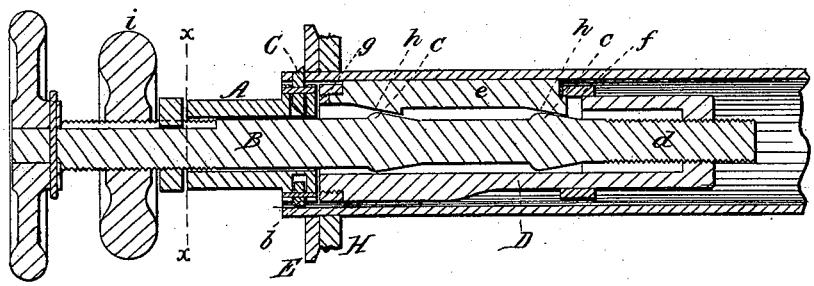


Fig. 2.

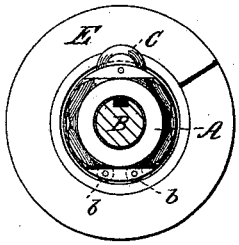
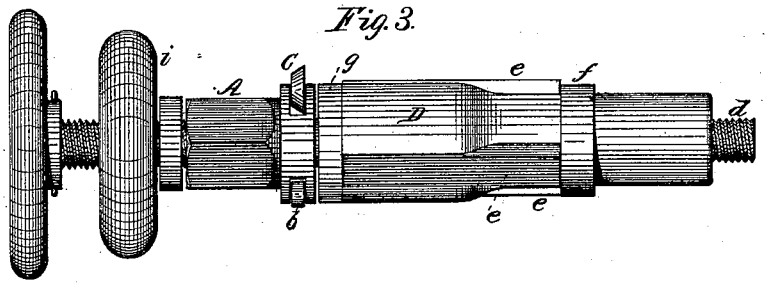


Fig. 3.



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UNITED STATES PATENT OFFICE.

DENNIS BUSHOR, OF EFFINGHAM, ILLINOIS, ASSIGNOR TO CEPHAS BUSHOR, OF SAME PLACE.

FLUE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 303,556, dated August 12, 1884.

Application filed November 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, DENNIS BUSHOR, of Effingham, in the county of Effingham and State of Illinois, have invented certain new and useful Improvements in Flue-Cutters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and to the figures and letters of reference marked thereon.

My invention relates to that class of tube-cutting implements which are especially designed and adapted for cutting off the projecting ends of boiler or other flues preparatory to securing the same in the boiler-head or flue-sheet; and it consists, primarily, in the application to the exterior of the tube or flue to be cut of a removable plate, forming a cutting-edge, to act in conjunction with a rotary cutter, whereby the walls of the tube are severed by a shear cut, and at one revolution of the cutter-head.

In the drawings, Figure 1 is a longitudinal section, and Fig. 2 an end view, of the device in position to operate upon a flue. Fig. 3 is a side view of the apparatus.

Similar letters of reference in the several figures denote the same parts.

The cutter-head A is provided with a central opening for the reception of the spindle B, and carries at one side, near the periphery, the cutting-disk C, one surface of which is plain and the other convex or beveled, as shown. Anti-friction rollers *b b* are journaled on the side of the head opposite the cutter. The spindle B, upon which the cutter-head revolves, passes through the clamping device D, and is provided near its inner end with two cones, *c c*, and a screw-threaded portion, *d*. The clamping device consists of a cylinder or body, D, slotted radially for the reception of clamps *e*—three or more in number. These clamps are held in the slots by the ring-seat *f* and screw-ring *g*, under which the lugs or reduced ends of clamps project. The inner faces of the clamps are provided with inclines *h h*, against which the cones or spindles have a bearing. The stationary shear-plate E, in connection with which the cutting-disk C operates, is made in the form of a flat ring or annulus slotted radially at one point to permit of its being sprung onto the tube, and to facilitate its removal therefrom. It is of a size adapted to the tube to be cut, and by its thickness serves as a gage to determine the amount of metal left projecting beyond the flue-sheet for beading or fastening in any well-known manner.

The operation of the device is as follows: The shear-plate E is first placed in position upon the tube and against the flue-sheet H. A cut is made in the end of the tube with a cold-chisel or other suitable device, sufficient to allow the cutter to rest against or in close proximity to the ring or stationary shear-plate. The clamping-head is inserted in the tube, and is fastened therein by the screwing in of the spindle, which causes the cones to bear upon the clamping-pieces and press them outward against the walls of the tube. The spindle being thus secured in position, the cutting-head is brought up by the hand-wheel *i*, working on the threaded section of the spindle, until the cutter occupies the notch previously prepared for it in the end of the tube. The parts being now in position, the cutter-head is given one revolution by means of a wrench, ratchet, or other well-known device, and the tube is completely severed by the conjoint action of the cutting-disk and stationary plate.

The annular cutting-plate may be removed by means of a chisel or other instrument inserted between it and the flue-sheet. The insertion of a pointed instrument or wedge in the slot will facilitate the withdrawal.

Both the revolving cutter-head and the annular shear-plate are made of different sizes to suit different diameters of tubes.

I claim as my invention—

1. The annular shear-plate slotted radially to facilitate its application and removal, substantially as described.

2. The device for centering and sustaining the rotary cutting-head, consisting, essentially, of the coned spindle B, threaded as described, slotted cylinder D, threaded for the reception of the spindle B, clamps *e*, ring-seat *f*, and screw-ring *g*, all combined and arranged substantially as set forth.

3. In combination with the spindle B, thread-

ed at its inner end, and provided with cones *c c*, slotted body D, threaded for the reception of the spindle B, and clamps *e*, the rotary head A, carrying the cutter C, and the hand-wheel *i*, substantially as described.

4. In a flue-cutter, the combination of the annular shear-plate, the rotary cutter mounted in the revolving head, and with its edge overlapping the annular shear-plate, and the spindle upon which the revolving head is mounted, provided with means for centering and sustaining the same within the flue to be cut, substantially as described.

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