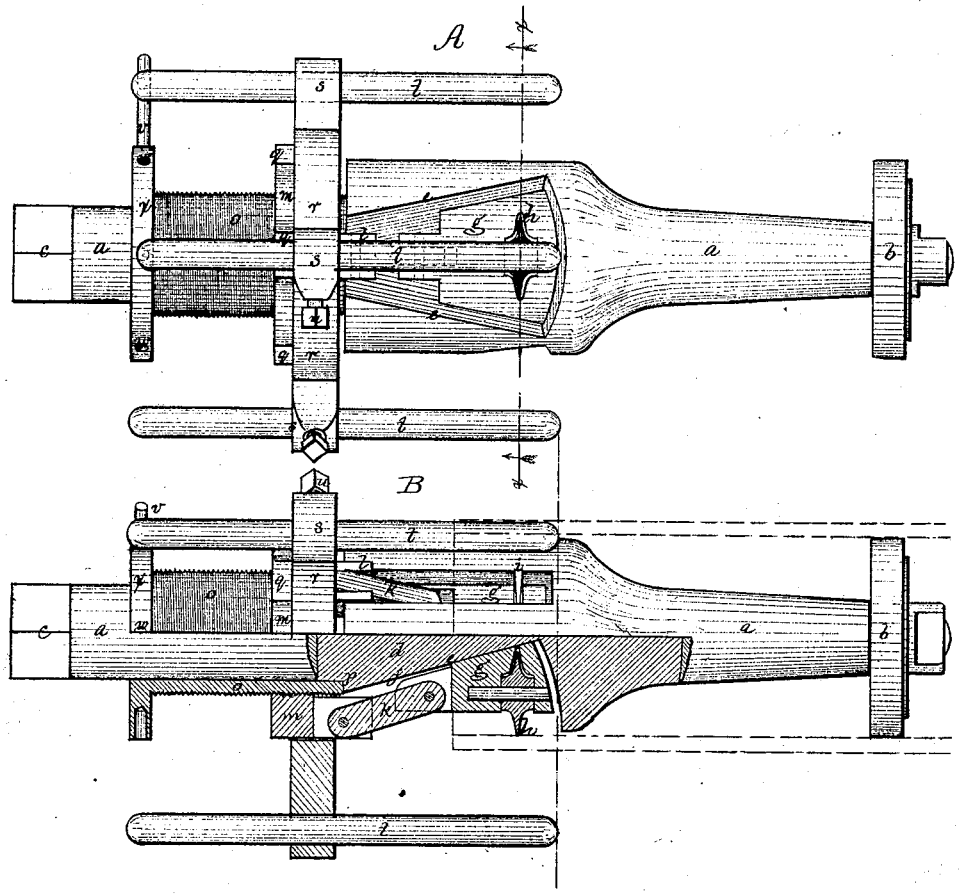
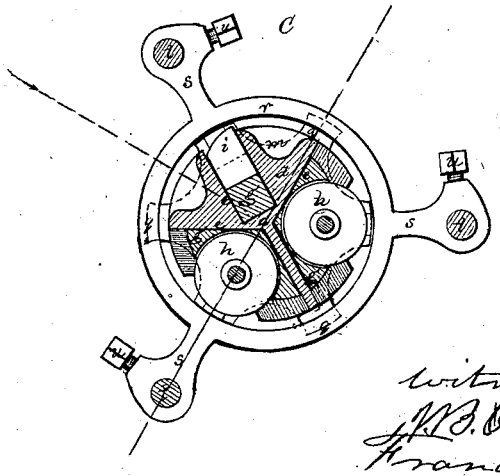
D. E. Eaton,

Tube Cutter.

No. 111,442. Patented Jan. 31. 1871.





D. E. Eaton

Witnesses
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United States Patent Office.

DANIEL E. EATON, OF BOSTON, ASSIGNOR TO HIMSELF AND JAMES S. HANSCOM, OF CAMBRIDGE, MASSACHUSETTS.

Letters Patent No. 111,442, dated January 31, 1871.

IMPROVEMENT IN TUBE-CUTTERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, DANIEL E. EATON, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Tube-Cutter; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to the construction of a tool designed for cutting off the projecting ends of steam-boiler tubes, and to such an arrangement of parts as shall render automatic a progressive outward movement of the cutters, to cause them to cut into and through the metal as the cutter-stock is rotated, the tool being of that class in which the cutters work from the inside of the tube and are expanded or forced outward as the cutting progresses.

My invention consists, primarily, in hanging the cutters in vertical cutter-stocks, which rest at their inner surfaces against incline faces on the sides of a center-rod, so that upward movement of the cutter-stocks causes them to be forced outward by the inclines, the cutter-stocks being hung to a nut-threaded collar or head, through which works a screw, so that rotation of the head and cutter-stocks, and the center-rod and its inclines in one direction, causes the rod and its inclines to be fed down upon the screw, the inclines thereby forcing the cutters outward, they acting only in one plane, at right angles to the axis of the tube.

The drawing represents a tube-cutting tool embodying my invention.

A shows the tool in elevation.

B shows it half in central section and half in elevation.

C is a cross-section on the line *x x*.

a denotes the central-rod, having at one end a disk or roll, *b*, by which it is centered in the tube, and at the opposite end a head, *c*, formed to be grasped by a suitable wrench or lever-handle.

In the sides of an enlarged part *d* of the rod, are recesses *e*, each increasing in depth from top to bottom, so that the inner walls or surfaces form inclines *f*.

In each of these recesses lies a cutter-stock, *g*, each stock having a suitable cutter, which may be a rotary disk-cutter, *h*, or a bit, *i*, so made as to displace the metal against which it acts, or to remove it in chips, as may be preferred.

The inner face or faces of each of these stocks rests against the adjacent incline, as seen at B and C, and each is preferably hung by a link, *k*, to ears or projections *l*, on the under side of a head, collar, or nut, *m*, through the nut-thread *n* of which passes a tubular feed-screw, *o*, the end of the rod *a* passing through the tube, as seen at B.

By turning the screw *o* relatively to the rod, tool-stock, and head, or *vice versa*, the screw acts against the surface *p* of the rod, and the tool-stocks are fed over the inclines, and as the stocks slide up the inclines, the cutters are thrown outward radially, so that, as the cutters, by their rotation, cut into the inner surface of the tube, they are fed outward as fast as they cut, the pitch of the screw-thread being such that the cutters are only fed outward in accordance with their cutting power

To gauge the distance from the end of a tube at which the cutters shall act, from the tube-sheet through which the tubes extend, I employ a device as follows:

The collar or tool-stock head *m* is formed with lips *q*, which lap over a ring, *r*, provided with radial arms *s*, in which arms, are fixed pins *t*, which are preferably slide-pins, held in place by screws *u*.

Before the rod *a* is inserted in the tube to be cut, the pins are set so that their inner ends are in a plane, as far from the plane of the cutters as the distance to which the tube-ends are to be left projecting, and the screws *u* are tightened, thereby fastening the pins in place, the cutters being then in a plane, at such distance from the tube-sheet as will leave the tube, when cut off, projecting just far enough to be turned over or expanded upon and fastened to the tube-sheet, and it will be obvious that whether any tube projects more or less, all will be thus trimmed so as to project to a uniform distance from the end of the tube-sheet.

To keep the feed-screw *o* from rotation while the cutters are rotating, a pin, *v*, is inserted in some one of a series of holes, *w*, made in a head, *x*, of the screw, this pin striking the first pin *t*, and remaining stationary against said pin, thereby locking the screw against rotative movement.

The tool thus organized, is very easily worked by a suitable wrench or lever applied to the outer end of the rod *a*, requires no skill in the workman to operate it, and cuts away only the metal necessary to effect the removal of the projecting tube ends.

I claim—

1. The rod *a*, with its inclines *f*, the cutter-stocks jointed to the nut or collar *m*, and the feed-screw *o*, combined and operating substantially as shown and described.

2. In combination with the cutters arranged to operate as described, the ring *r*, and gauge-pins *t*, substantially as shown and described.

Executed November 11, A. D. 1870.

D. E. EATON.

Witnesses:

FRANCIS GOULD,

M. W. FROTHINGHAM.