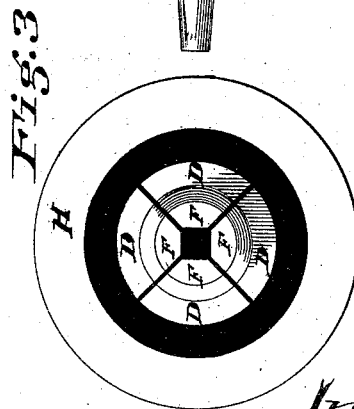
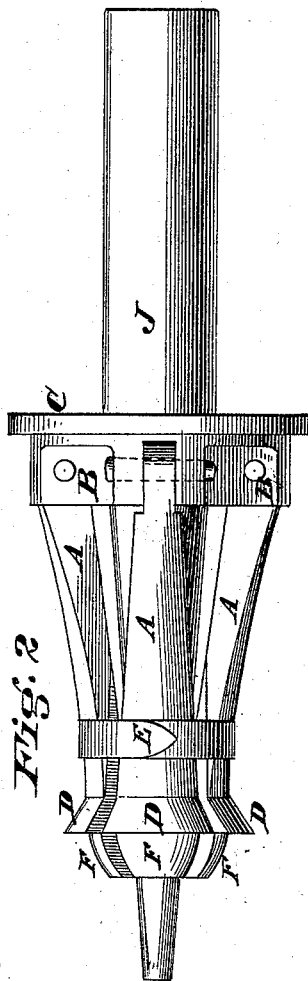
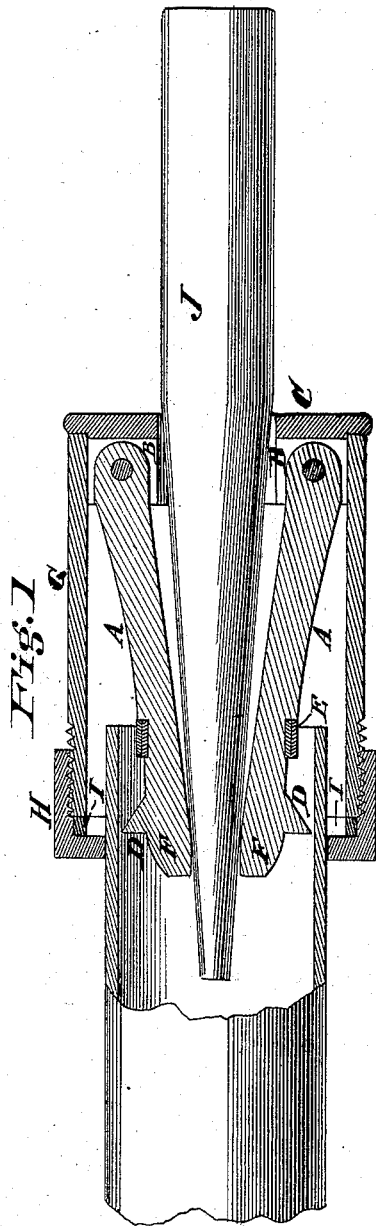


S. L. DAVIS.
 Tube Cutter or Trimmer.

No. 217,347.

Patented July 8, 1879.



Attest
 Edgar H. Cross
 J. C. Grant

Inventor
 Samuel L. Davis
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 His Atty.

UNITED STATES PATENT OFFICE.

SAMUEL L. DAVIS, OF CANTON, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT
TO C. AULTMAN & CO., OF SAME PLACE.

IMPROVEMENT IN TUBE CUTTERS OR TRIMMERS.

Specification forming part of Letters Patent No. **217,347**, dated July 8, 1879; application filed
January 18, 1879.

To all whom it may concern:

Be it known that I, SAMUEL L. DAVIS, of Canton, in the county of Stark and State of Ohio, have invented a new and useful Tube Cutter or Trimmer; and I do hereby declare the following to be a full, clear, and exact description of the same, which will enable others skilled in the art to make and use it, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of my improved tube-cutter applied to a tube, which is also shown partly in section. Fig. 2 is a side elevation of the cutter with the case and cap which receives the tube removed. Fig. 3 is a front elevation of the cutters and their expanding-wedge.

Similar letters of reference denote similar parts.

My invention is designed to provide a simple and effective tool for cutting or trimming boiler and other tubes before they are applied to use without bending or otherwise injuring their cut ends; and to this end it consists, first, in a series of segmental cutters arranged within a case, and adapted to be inserted in the tube to be cut, and forced outward to sever its end, combined with a cap around the cutters, in which the tube is held while being cut and after the cutting is completed, and which also forms an anvil, along which the cutters move with a shearing cut, and thereby avoid the formation of a burr on the end of the cut tube.

It also consists in constructing the cutter-arms with beveled joints outside the cutters, to operate in connection with the inclosing-cap which receives the tube to be cut, for the purpose of cutting a tube whose sides differ in thickness, and to simultaneously cut the tube and open its end for the reception of the tube-expander which is to be afterward applied.

It also consists in adapting the cap for adjustment on the inclosing-case of the cutters, for the purpose of adjusting the bearing-edge of the cap with respect to the edges of the cutters.

It also consists in the combination of one or

more loose washers with the case and adjustable cap, by which the latter is stopped at the proper point to register with the cutter, all as I will now proceed to describe in detail.

In the accompanying drawings, A A are the cutter-arms, two or more in number, pivoted at one end radially to ears or lugs B, projecting from one side of a circular metal head, C. The free end of each arm is formed with a segmental steel cutter, D, and when the arms are all contracted by a steel or other elastic ring, placed around them, the centers of the cutters come together, or nearly so.

In Fig. 3 I have shown four cutters of quadrant shape, their inner angles being cut off to form an opening for the point of the conical wedge or mandrel. When held together, as shown, the outer edges of the cutters form a circle, and are in position to be inserted into a tube.

The points F of the arms project beyond the cutters, and are beveled off concentric with the edges thereof.

G is the cylindrical case inclosing the cutter-arms, and fitted to the head C by being slipped over the shoulder formed by the ears to which the arms are pivoted. The outer end of the case extends nearly to the line of the cutters, and is provided with an exterior screw-thread to receive a cap, H, having a circular center opening to receive the end of the tube to be trimmed, and through which the cutter-arms project into the tube. The cap should be adjusted upon the case so that the edges of the cutters when expanded shall just clear the inner edge of the opening in the cap, and thereby form a shearing cut. The edges of the opening, therefore, form a head or anvil to sustain the tube while being severed.

One or more loose washer-rings, I, inserted between the cap and the edge of the case, serve to arrest the inward movement of the cap at the proper point for registering the cutters with the edge of the central opening in the cap, thereby insuring a proper support for the latter, preventing it from being casually turned or moved inward too far, and also preventing the screw-threads on the cap and case from being broken when the device is in use.

The operation of trimming a tube is as follows: The end of the tube is inserted the required distance within the central opening in the cap, the cutters at the same time entering the tube, as shown in Fig. 1. The expanding-wedge, J, which may be square, circular, or of other form in cross-section, is then passed through the central opening in the head C and driven inward between the cutters, causing the latter to move radially outward and sever the tube flush with the inner edge of the cap.

Inasmuch as the cutters separate from each other as they move outward, spaces will be left in the tube uncut in the line of such separation, and to cut these spaces the wedge is withdrawn slightly, the cutters partly turned in the tube, and again forced outward to complete the cut.

It will thus be seen that the tube will be severed with a clean shearing cut, which prevents the formation of a burr on the main portion, while the same is properly supported and prevented from being pressed out of shape.

If the tube should be thicker on one side than on the other, the cutters will sever the thinnest side first, and then cease to move, while those acting upon the thickest side will continue their motion until the metal is cut through. This is due to the independent action of the cutters, and to the fact that their outward movement is only arrested after they have passed entirely through the tube and their points F brought in contact with the interior thereof. The inclination given to the outer surface of these points bevels the end of the tube slightly outward when the cut is completed, and thus opens it for the reception of a tube-expander.

If for any reason the cutters are to be removed and a new set applied to the head, the loose washer-rings can be changed or adjusted

to insure the proper registering of the cutters and cap when the latter is adjusted.

Having thus described my invention, what I claim is—

1. In a tube cutter or trimmer consisting of a series of segmental cutters adapted to operate radially outward from the interior of the tube to be cut, the combination of such cutters with a surrounding case and an inclosing head or anvil, H, forming a detachable part of the tool, against which the exterior of the tube is held while and after being cut, and along the edge of which the cutters are moved outward with a shearing cut, substantially as described, for the purpose specified.

2. In an inside tube-cutter, the combination of the beveled points F with the independent segmental cutters and the cap H, having a central opening and forming part of the tool, substantially as described, for the purpose specified.

3. The adjustable cap H, combined with the case G, for the purpose of registering the inner edge of the cap-opening with the edges of the cutters, substantially as described.

4. The combination of one or more loose washer-rings, I, with the adjustable cap, the inclosing-case, and the cutters, substantially as described, for the purpose specified.

5. The combination of the head C, pivoted cutter-arms A, the cutters D, having beveled points F, the case G, adjustable cap H, and washer-ring I, the cutters being adapted for expansion by the wedge J, substantially as described, for the purpose specified.

In testimony of which invention I have hereunto set my hand.

SAMUEL L. DAVIS.

Witnesses:

CHAS. J. GATSHALL,
M. B. COX.