

No. 662,893.

Patented Nov. 27, 1900.

D. E. DAVIS.
BOILER TUBE CUTTER.

(Application filed Mar. 15, 1900.)

(No Model.)

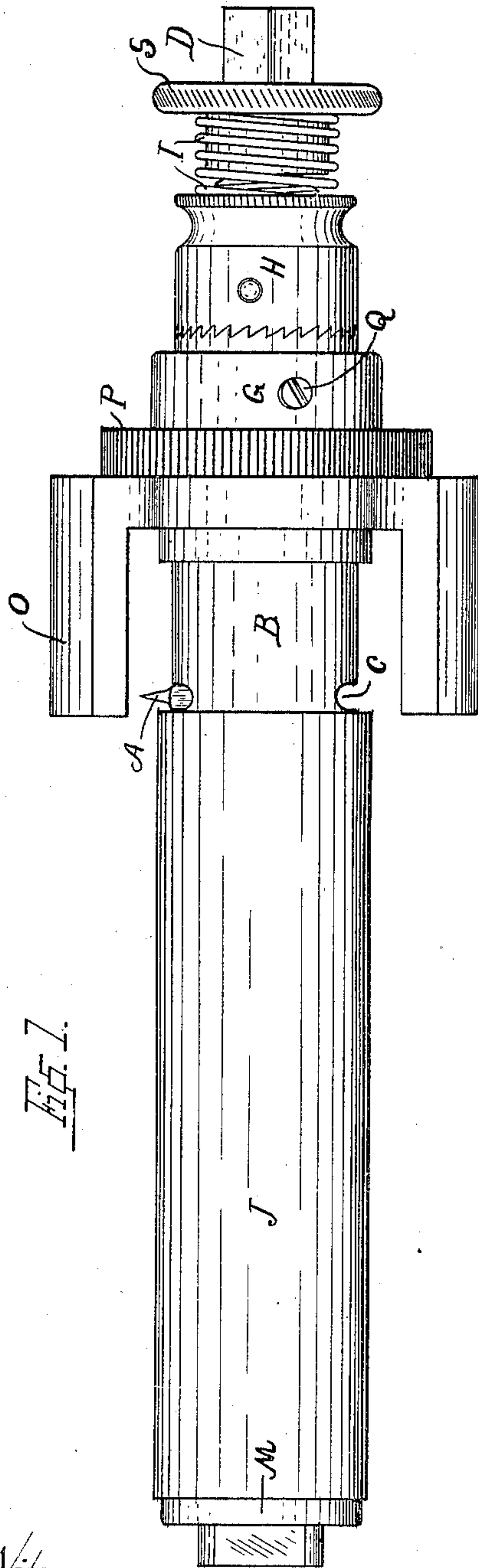


Fig. 1.

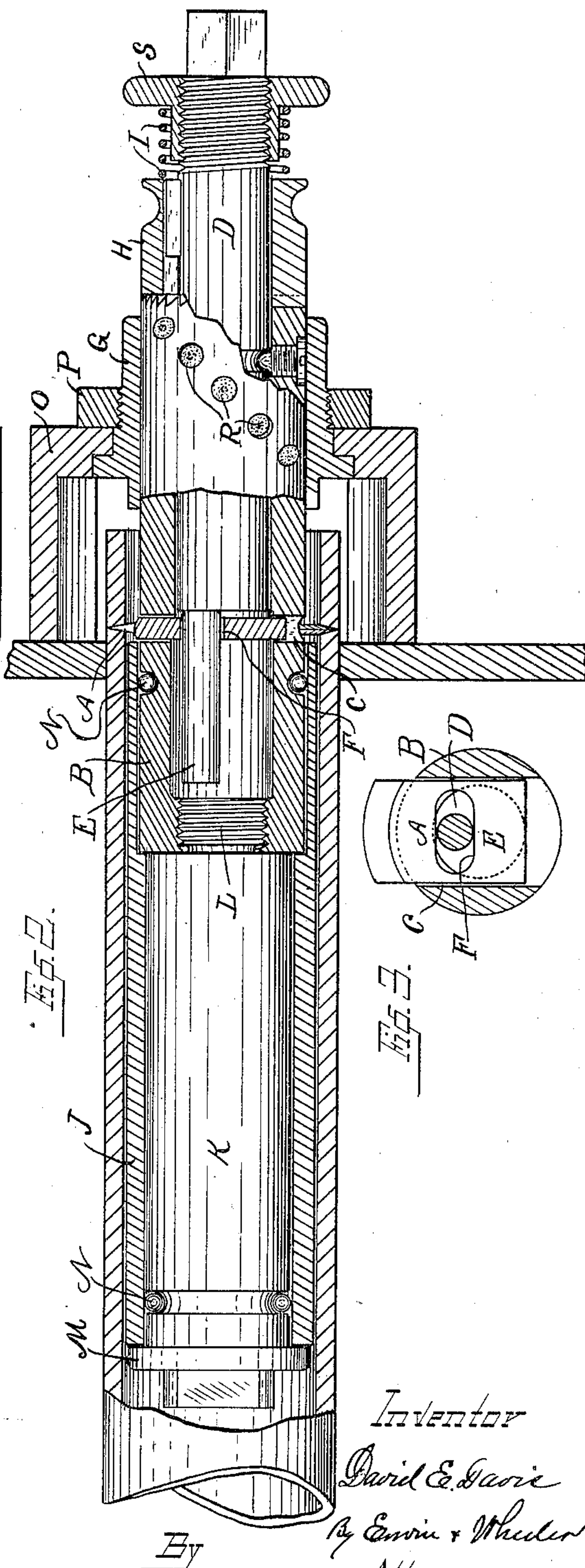


Fig. 2.

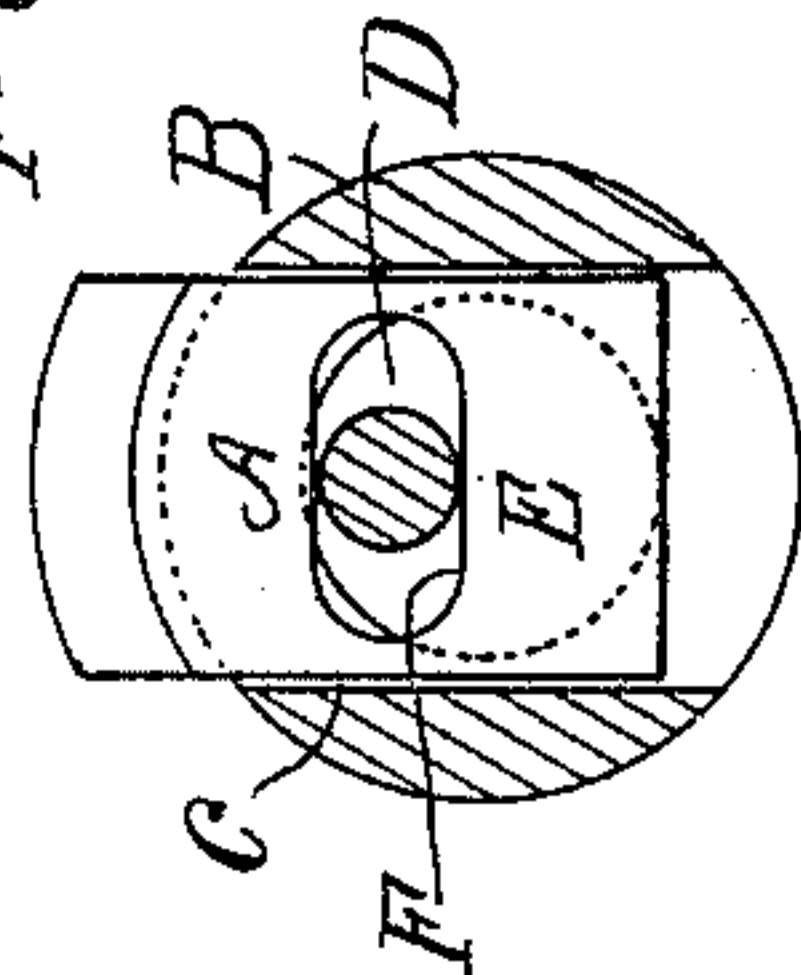


Fig. 3.

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UNITED STATES PATENT OFFICE.

DAVID E. DAVIS, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO
WALLACE C. DAVIS, OF SAME PLACE.

BOILER-TUBE CUTTER.

SPECIFICATION forming part of Letters Patent No. 662,893, dated November 27, 1900.

Application filed March 15, 1900. Serial No. 8,763. (No model.)

To all whom it may concern:

Be it known that I, DAVID E. DAVIS, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Boiler-Tube Cutters, of which the following is a specification.

My invention relates to improvements in boiler-tube cutters; and it pertains to that class which are adapted to cut a tube from its interior outwardly. With this class of tube-cutters as heretofore constructed it has been difficult to retain them in a fixed position within the tube with sufficient rigidity to form a smooth uniform cut at right angles to the axis of the tube. By my improvement the cutting-tool holder proper is now provided with a cylindrical extension-sleeve of greater or less length, according to the diameter of the tube to be cut, which extension-sleeve is of nearly equal diameter to that of the boiler-tube and is caused by the lateral pressure of the operator upon the cutter-shank when revolving it to impinge against the interior walls of the tube, whereby the tool is held in place with sufficient rigidity to produce the desired cut.

My improvement pertains, further, to the shape of the cutting-tool and the mechanism for feeding the same.

My invention is further explained by reference to the accompanying drawings, in which—

Figure 1 represents a side view. Fig. 2 represents a longitudinal section. Fig. 3 represents a front view of the cutting-tool.

Like parts are referred to by the same reference-letters throughout the several views.

I am aware that a tube-cutter consisting of a cutting-tool A, tool-supporting sleeve B, provided with transverse apertures C for the reception of said tool A, operating-shank D, provided with eccentric-pin E, operating in the slot F of said cutting-tool A, adjustable collar G, serrated feed-collar H, and bearing-spring I has previously been used, and I therefore do not claim such parts as my invention.

By my improvement a revoluble sleeve J is secured to the periphery of the sleeve B upon a central trunnion K. The trunnion

K is secured to the sleeve B by a threaded joint L. The trunnion K is provided with a radial flange M, which retains the sleeve J in place, thus forming an extension which when in use is held in place within the tube to be cut. The so-called "extension" refers to all that part of the tool at the left of the sleeve B in Figs. 1 and 2. By this arrangement the friction of the tool-supporting sleeve heretofore used against the interior wall of the tube is avoided, as the revolving sleeve B is prevented from coming in contact with the interior of the pipe, and as the contiguous surfaces of the sleeve J and trunnion K may be kept lubricated the friction of turning the sleeve B is diminished, and the labor of operating the tool is very much reduced. It is also obvious that by inserting ball-bearings N N between the sleeve J and its supporting-bearings, as indicated in Fig. 2, the friction of such parts may be almost entirely overcome, when, owing to the length of such extension-bearings, the cutting-tool will be held rigidly in place.

It is a well-known fact that when securing the boiler-tubes in place it often becomes necessary to cut the ends of some of the tubes which protrude through the boiler-head, in which case it is important to sever the tube at a uniform distance from the head with a smooth uniform cut. To accomplish this object, I have provided, in addition to the adjustable collar G, a gage O, which is secured to the adjustable collar G by a screw-threaded ring P. The gage O and collar G are simultaneously adjusted upon the sleeve B by the set-screw Q at intervals corresponding with the indentations R formed in the sleeve B, whereby when said gage is brought against the head of the boiler, as indicated in Fig. 2, the cutting-tool A may be adjusted and retained at any desired point within the tube to be cut and the same severed with a smooth cut at a uniform distance from said head.

The teeth of the serrated feed-collar H are held in contact with the opposing teeth of the tool by the spiral spring I, and the tension of the spiral spring I against said feed-collar is increased or diminished by the hand-nut S, which has screw-threaded bearings upon the shank D. It will be obvious that by this ar-

rangement the cutting-tool A is forced out-
 wardly and into the walls of the tube to be
 cut by the movement of the eccentric-pin E
 as the shank D is turned forward and that
 5 when thus forced into the wall of the tube to
 be cut it is driven in a circular course in con-
 tact with the wall of the tube by rotating the
 shank D and sleeve B together. Motion is
 communicated from the shank D to the sleeve
 10 B through the serrated edges of said feed-
 collar and tool, as will be understood. The
 edge of the cutting-tool A is made of a uni-
 form circular shape on each side of a line
 drawn through its longitudinal axis, whereby
 15 when one corner becomes dull the tool may
 by turned over and the opposite corner used.

In operating my device it becomes neces-
 sary with each revolution of the cutting-tool
 to pull back the feed-collar and adjust it one
 20 tooth in advance, whereby the eccentric-pin
 E is rotated and the cutting-tool is driven far-
 ther into the tube to be cut. Owing to this
 fact it becomes necessary to procure a nice
 adjustment of said spring I, which is accom-
 25 plished by substituting the adjustable hand-
 nut S for the stationary or fixed collar here-
 tofore used.

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

1. In a boiler-tube cutter, the combination
 with the supporting-sleeve B of the cutting-
 tool; and the operating-shank D, of a sepa-
 rate extension bearing or trunnion K remov-
 35 ably affixed to said tool-supporting sleeve;
 and a removable extension-sleeve J, support-
 ed by and upon said trunnion, substantially
 as and for the purpose specified.

2. In a boiler-tube cutter, the combination
 40 with a tool-supporting sleeve B, and an op-

erating-shank D, of a separate extension bear-
 ing or trunnion K connected at one end by
 screw-threaded joint to said tube-supporting
 sleeve; an extension-sleeve J supported by
 and upon said trunnion and one or more series 45
 of ball-bearings, interposed between said
 trunnion and said sleeve, substantially as and
 for the purpose specified.

3. In a boiler-tube cutter, the combination
 with a tool-supporting sleeve and an op- 50
 erating-shank, of an extension-bearing, con-
 sisting of a trunnion rigidly affixed to said
 supporting-sleeve; and an inclosing sleeve
 supported upon said trunnion; and a screw-
 threaded gage-collar adjustably secured by 55
 screw-threads to a corresponding thread
 formed upon the periphery of said tool-sup-
 porting sleeve, substantially as and for the
 purpose specified.

4. In a boiler-tube cutter, the combination 60
 with a tool-supporting sleeve; an operating-
 shank; a trunnion rigidly affixed to said tool-
 supporting sleeve; a revoluble sleeve sup-
 ported by and upon said trunnion; a gage-col-
 lar adjustably secured to said tool-support- 65
 ing sleeve; a serrated feed-collar, the teeth of
 which are adapted to mesh with correspond-
 ing teeth formed in one end of said tool-sup-
 porting sleeve; an adjustable hand-nut hav-
 ing screw-threaded bearings on the operating- 70
 shank; and a tension-spring interposed be-
 tween said hand-nut and the opposing end of
 said feed-collar, all substantially as and for the
 purpose specified.

In testimony whereof I affix my signature 75
 in the presence of two witnesses.

DAVID E. DAVIS.

Witnesses:

H. L. MARKHAM,
 B. RHODE.