

(No Model.)

J. MILLER.
TUBE CUTTER.

No. 605,257.

Patented June 7, 1898.

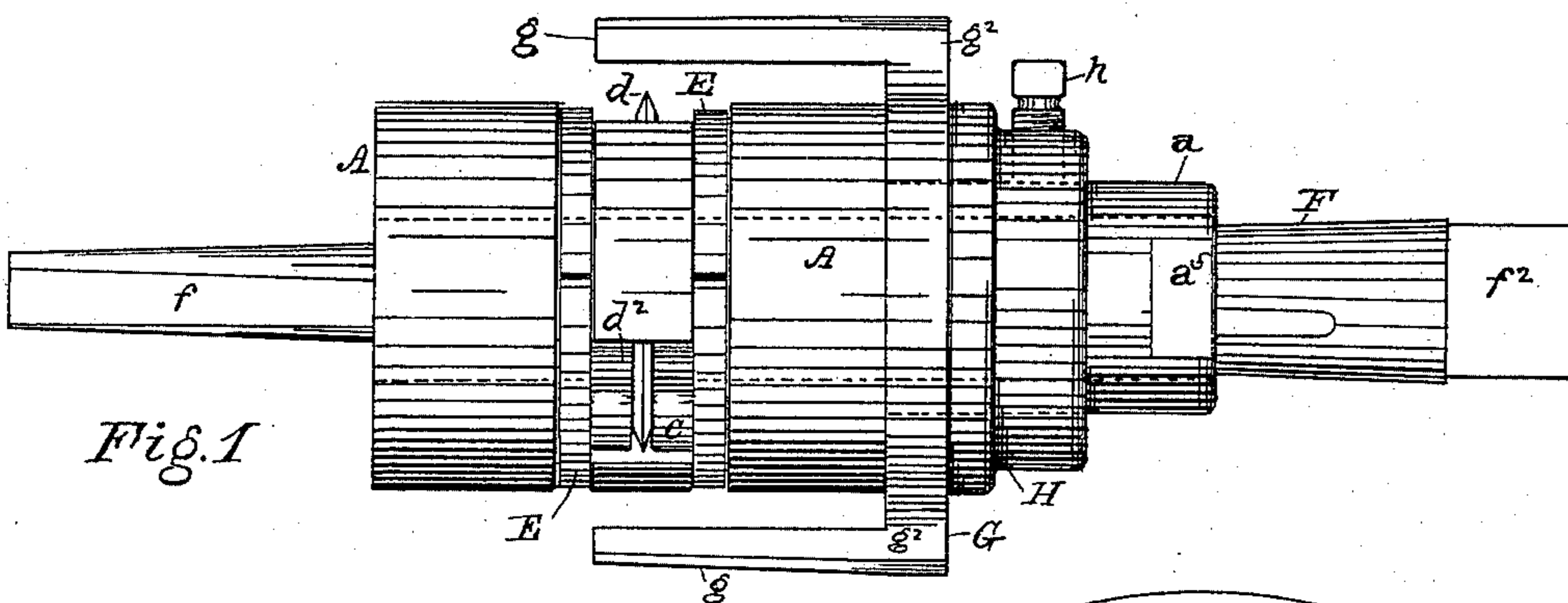


Fig. 1

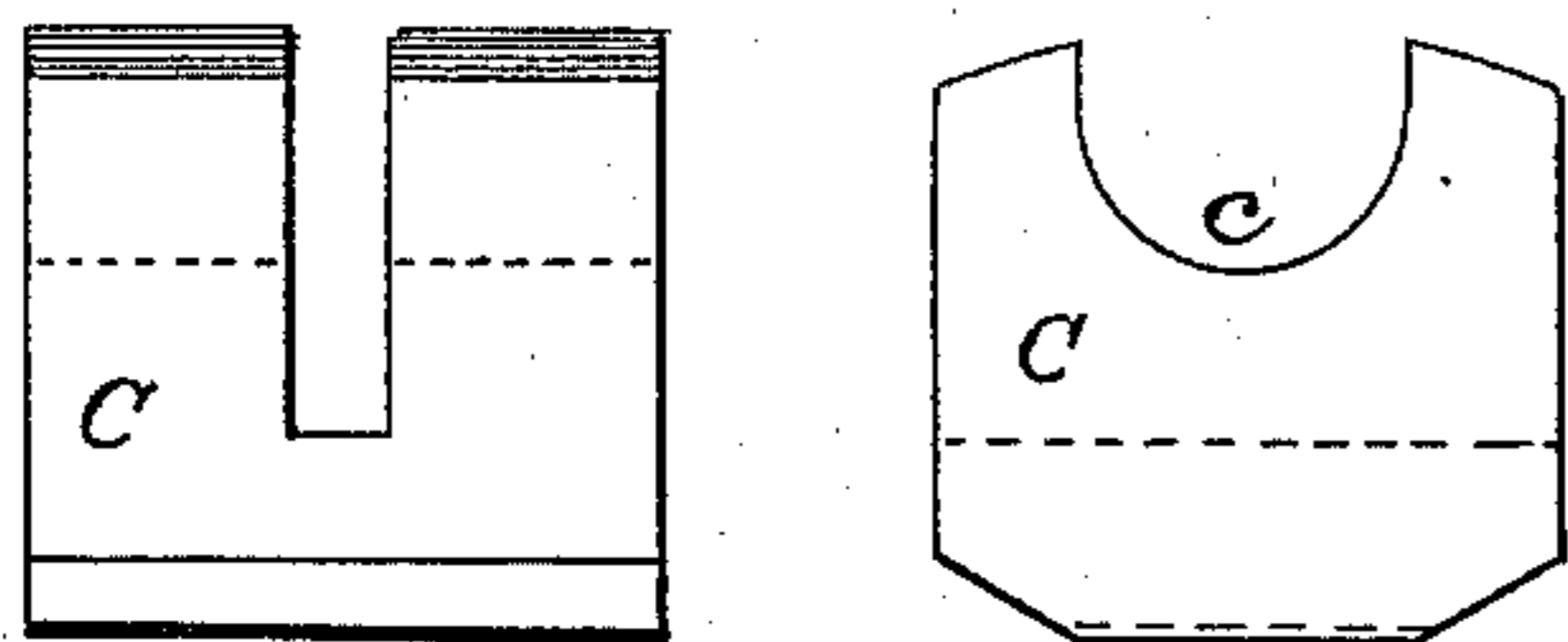


Fig. 4

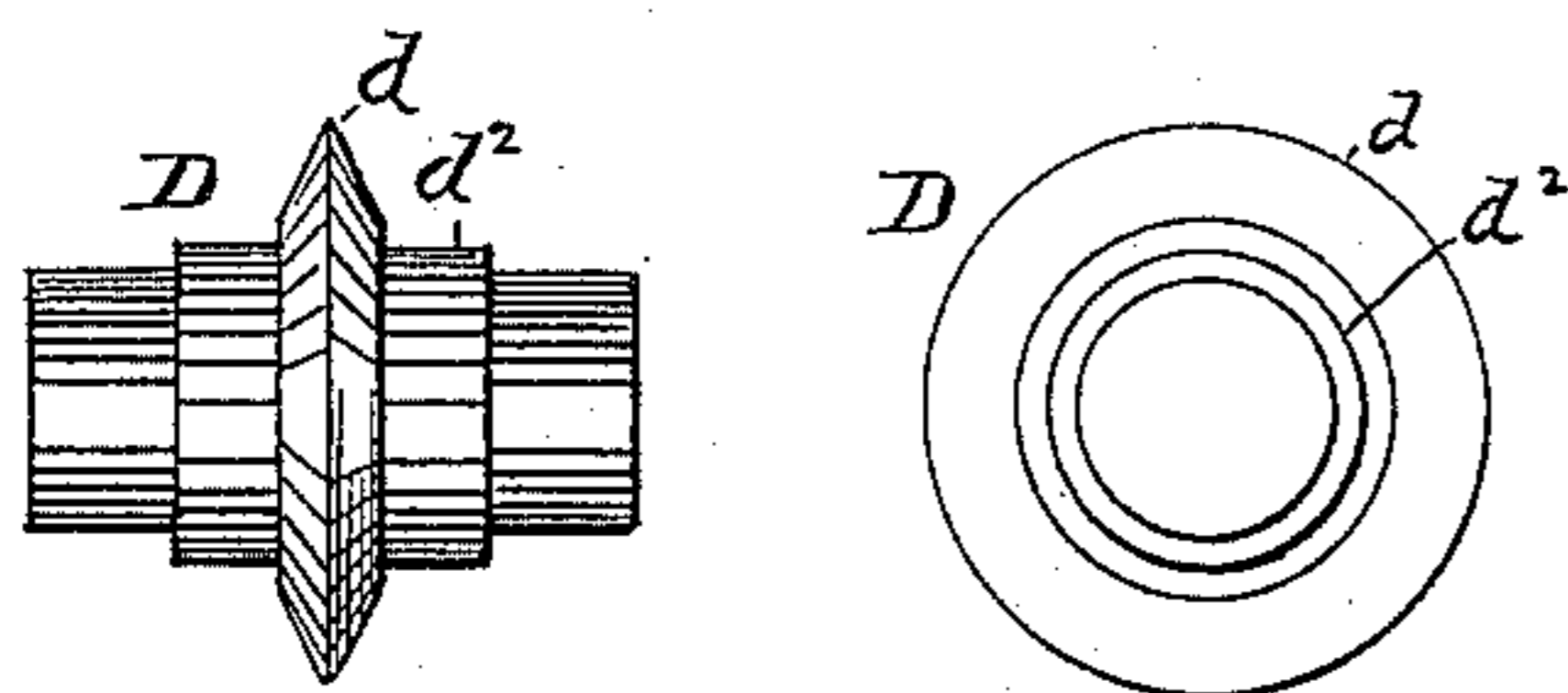


Fig. 5

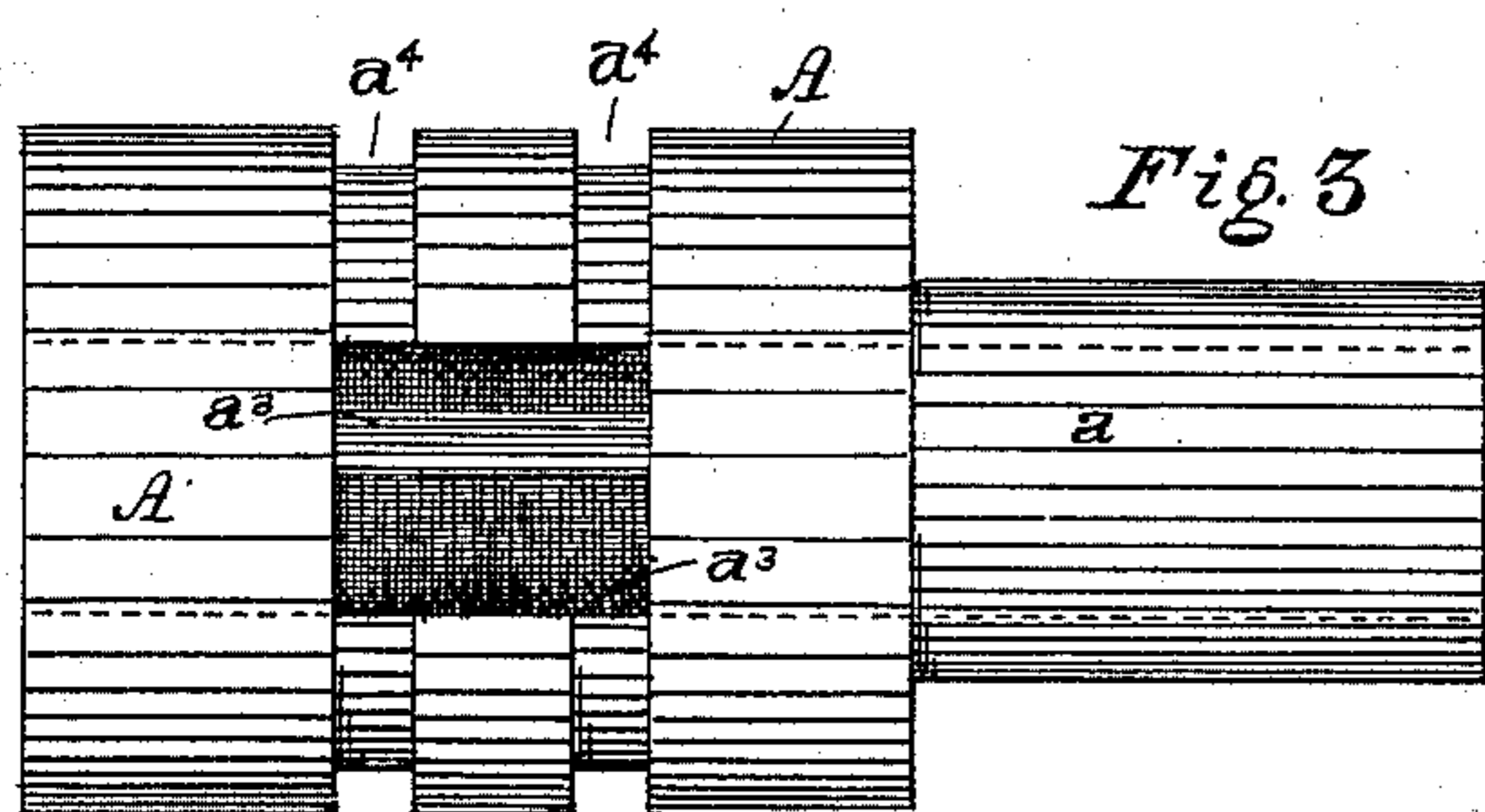


Fig. 6

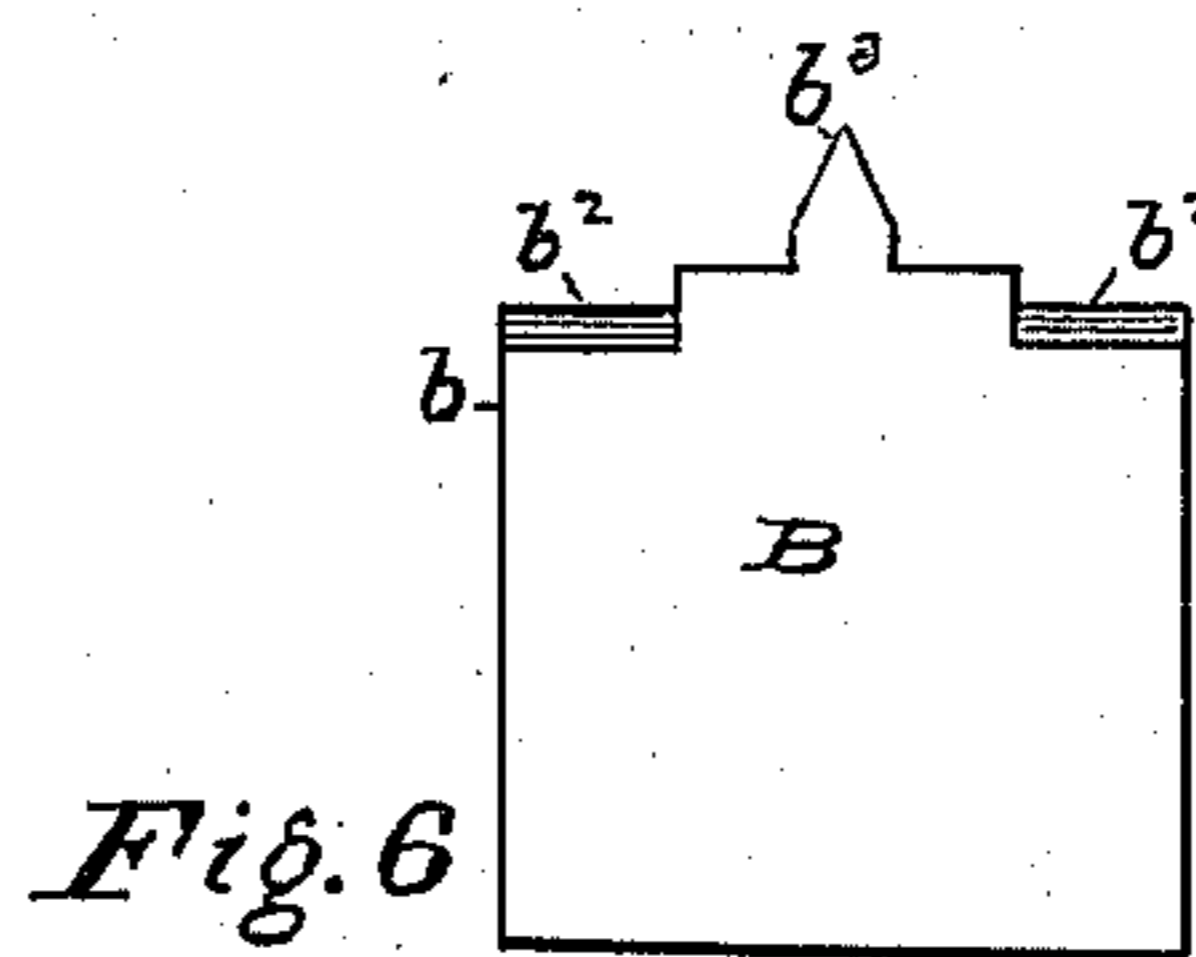


Fig. 7

WITNESSES

M. B. Vorce.

H. B. Cavanaugh.

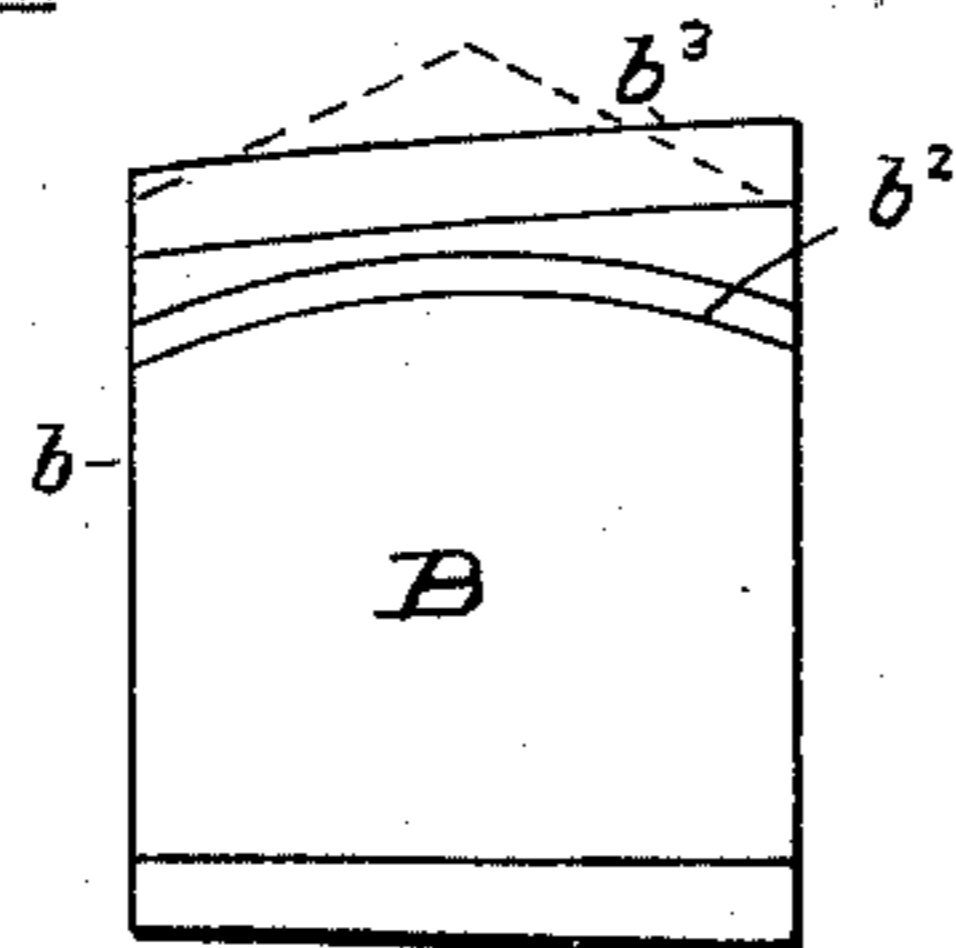


FIG. 7

INVENTOR

Jeremiah Miller

by *C. M. Vorce*
Attorney.

UNITED STATES PATENT OFFICE.

JEREMIAH MILLER, OF CLEVELAND, OHIO.

TUBE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 605,257, dated June 7, 1898.

Application filed March 31, 1897. Serial No. 630,069. (No model.)

To all whom it may concern:

Be it known that I, JEREMIAH MILLER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Tube-Cutters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in tube-cutters; and it consists in the novel construction, arrangement, and combination of parts for the purpose of simplifying the construction and improving the efficiency of the apparatus.

In the drawings, Figure 1 is a side view of the apparatus complete. Fig. 2 is an end view in elevation of the apparatus with the wedge or mandrel removed. Fig. 3 is a side view of the body or shell. Fig. 4 is a detail showing in front and side view the case or cage for the preferred form of cutter. Fig. 5 is a side and end view of the rotary cutter. Fig. 6 is a front view, and Fig. 7 an end view, of a modified form of cutter.

A represents the cylindrical or slightly-tapered shell, loosely fitting the tube and having an elongated cylindrical neck a , which may or may not be provided with one or more flat faces a^5 and is longitudinally pierced by a channel a^2 , preferably cylindrical, into which open a number of radially-disposed angular channels a^3 , formed in the solid barrel intermediate of its length and extending from the channel a^2 to the exterior of the shell, as best seen in Fig. 2. I have shown three such radial channels and regard three as the preferable number; but obviously two, four, or more could be used, although with less certainty of an equal bearing and action of all the cutters than where three are employed. In these radial channels or dieways a^3 are seated cutting-dies B, Figs. 6 and 7, or the die-carrying cages G, Fig. 4, in which are seated the rotary dies or cutters D, which I prefer to the dies B. The cages C fit the channels a^3 and are formed with a bearing c , in which the shaft d^2 of the cutter D seats. The cutter D has the hardened cutting edge d and a cylindrical short shaft d^2 , which is stepped down at its extremities, as shown in

Fig. 5, forming a seat for springs E, which surround the shell A, seating in grooves a^4 therein, and bear on the shafts of the cutters D, thus at the same time retaining the cutters in their seats in the cages C and pressing the cages and cutters toward the center of the shell.

To force outward the cutters and cut the tube, a tapering wedge or mandrel F, preferably having the same number of flat faces f as there are cutters, is inserted into the central channel a^2 between the cages C and driven in until the cutters bite into the inner surface of the tube to be cut, when the wedge F is turned by a wrench or other suitable means applied to the square or angular part f^2 at its outer end and may be supplemented by a wrench applied to the neck a . With three cutters, as shown, one-third of a turn makes a cut completely around the tube. The wedge is then driven farther in, causing the cutters to bite deeper, and another turn made, thus speedily cutting through the tube. The dies B operate in a similar manner; but they may also be used after the manner of a shear or chisel by driving in the wedge F until the dies B cut through the tube, then withdrawing the wedge, and turning the shell and cutters part way around and again driving in the wedge. With three dies the third driving of the wedge will cut the tube completely off. The cutters B have their body b fitting the channel a^2 and have shoulders b^2 , on which the springs F seat, the cutting edge b^3 being preferably inclined, as shown; but it may be otherwise shaped—for instance, pointed, as shown in dotted lines in Fig. 7. Both the cutters B and the cages C are slightly tapered, as shown, to correspond with the taper of the wedge, and by reason of their width afford a perfectly solid bearing for the wedge, so that when the wedge is in place the whole apparatus is as rigid as a single piece.

For use in cutting off boiler-flues, &c., a gage G is provided, which fits upon the neck a and turns freely thereon, having arms g , which project from the expanded portions g^2 and bear against the boiler-face. A collar H also fits on the neck a and is secured at the proper point thereon by a set-screw h , threaded through the collar, as seen in Fig. 1. In setting the cutter the set-screw is loosened,

and the arms *g* being placed against the boiler-face the shell *A* is pushed in until the cutters are at the point where the cut is to be made, when the screw is tightened, the wedge driven in, and the operation proceeded with.

The springs *E* are flat rings cut through at one point, as seen in Fig. 1, and are sprung on over the shell. When the cut is finished, the wedge is withdrawn and the springs retract the cutters, when the instrument can be removed. The neck *a* may be considerably longer than shown, and the flat faces *a*⁵ may be used alone for rotating the tool, if preferred.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A tube-cutter comprising in combination a tubular body having a reduced neck and a number of radiating channels extending through the body intermediate of its length, cutters seated in said channels and having radial movement therein, springs pressing said cutters inward, a gage revolvably fitting on the neck, a sliding collar fitting on the neck and having a binding-screw, and a tapering wedge having peripheral flat faces engaging and actuating each of the cutters and adapted to be turned to rotate the apparatus, substantially as described.

2. In a tube-cutter the combination of a tubular body having a neck of less diameter with external flat faces, and having intermediate radial channels extending through the body-wall, cutters fitting said channels and movable radially therein, annular flat springs seated in grooves on the cutter-body and pressing the cutters inward, a gage revolvably fitting on said neck, a sliding collar fitting on said neck and having a binding-screw, and a tapering wedge having peripheral flat faces engaging the cutters and adapted to be turned to rotate the apparatus, substantially as described.

3. In a tube-cutter the combination of a tubular body having a neck of less diameter with external flat faces, and having intermediate radial channels extending through the body-wall, cutters fitting said channels and movable radially therein, annular flat springs seated in grooves on the cutter-body and pressing the cutters inward, a gage revolvably fitting on said neck and having forward-extending arms, a sliding collar fitting on said neck

and having a binding-screw, and a tapering wedge having peripheral flat faces engaging the cutters and adapted to be turned to rotate the apparatus, substantially as described.

4. A tube-cutter comprising in combination a tubular body having a neck of less diameter, a number of radiating channels extending through the solid body-wall intermediate of its length, cutter-cages fitting said channels and movable radially therein, rotary cutters journaled in said cages, springs seated in grooves on the cutter-body and pressing said cutters inward, a gage revolvably fitting on said neck, a sliding collar fitting on said neck and having a binding-screw, and a tapering wedge having peripheral flat faces engaging the cutter-cages and adapted to be turned to rotate the apparatus, substantially as described.

5. In a tube-cutter the combination of a tubular body or barrel transversely grooved externally and having intermediate radial channels extending through its body-wall, cutters fitting said channels and movable radially therein, said cutters having external shoulders and flat axially-inclined inner faces, flat annular springs seated in the grooves on said barrel and bearing on the shoulders of the cutters, and a tapering wedge having flat peripheral faces engaging each of the cutters and adapted to be turned to rotate the apparatus in the tube, substantially as described.

6. In a tube-cutter the combination of a tubular body or barrel transversely grooved externally and having intermediate radial channels extending through its body-wall, cutters having external shoulders and an intermediate cutting edge and flat axially-inclined inner faces, flat annular springs seated in the grooves on said barrel and bearing on the shoulders of the cutters, a revolvable gage and a clamping-collar fitting on the barrel, and a tapering wedge having flat peripheral faces engaging each of the cutters and adapted to be turned to rotate the apparatus in the tube, substantially as described.

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

JEREMIAH MILLER.

Witnesses:

W. E. MORROW,
M. A. MORROW.