(No Model.)

2 Sheets—Sheet 1.

P. H. BENADE.

TUBE CUTTER.

No. 412,944. Patented Oct. 15, 1889.

Fig. 1.

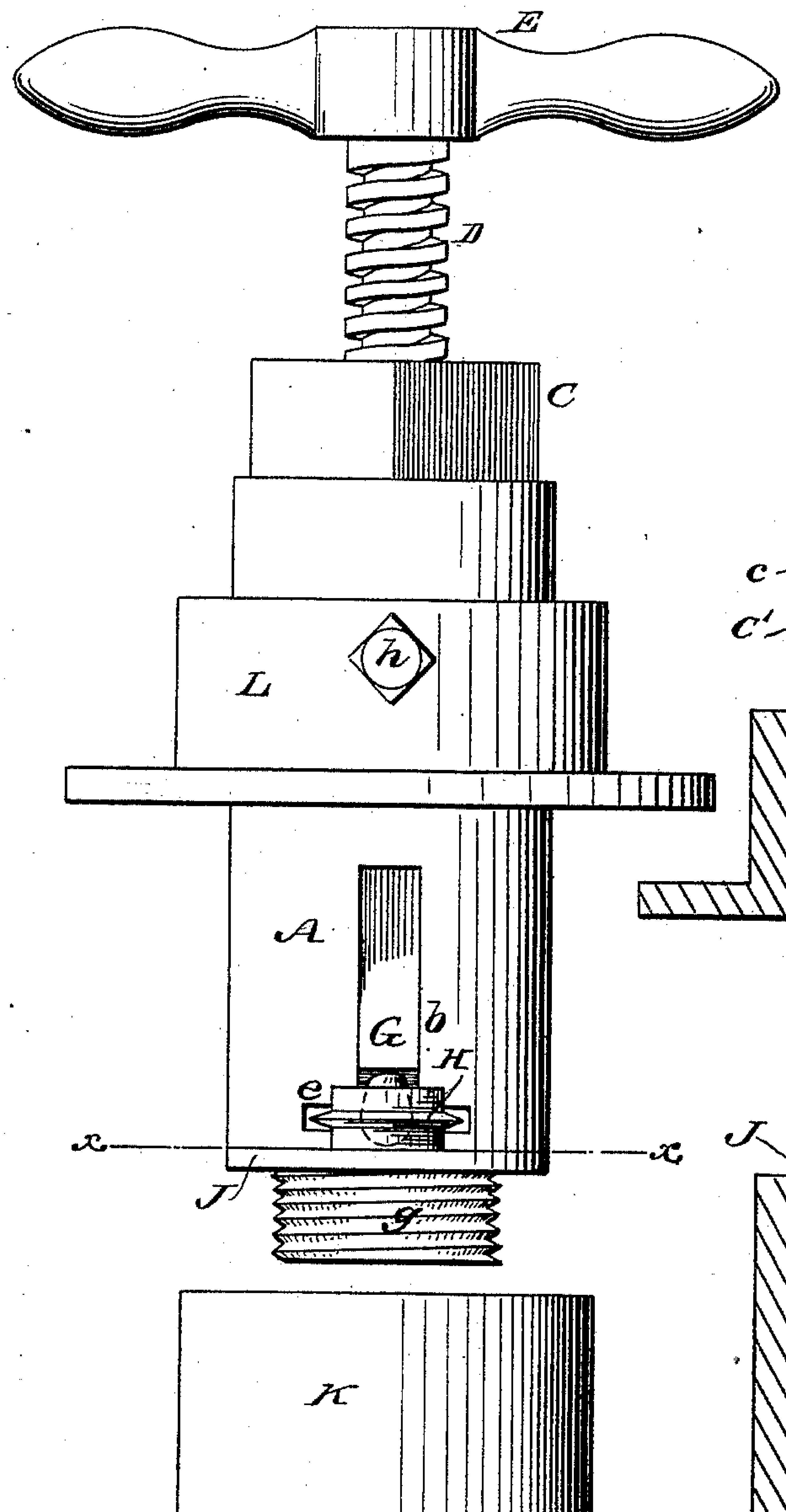
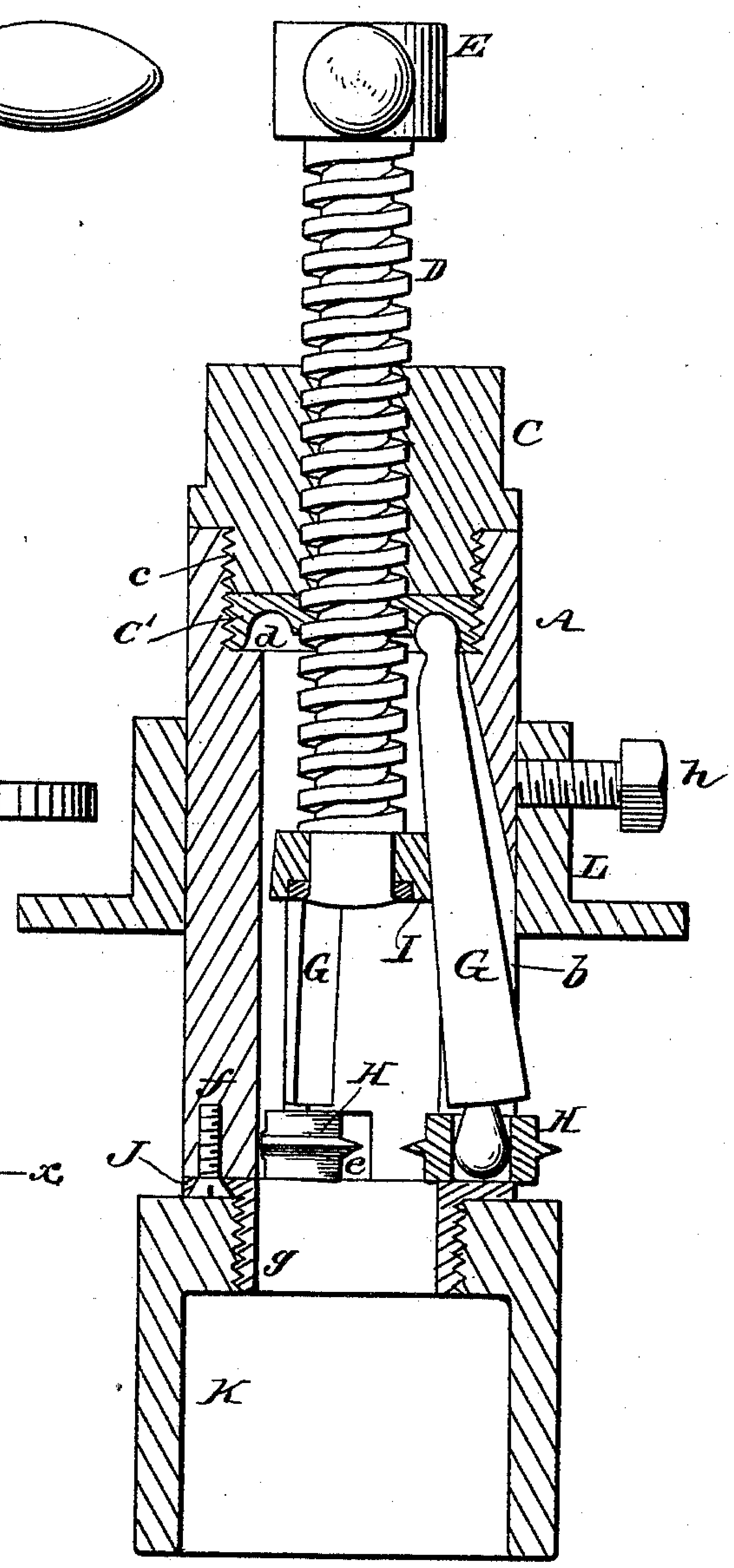


Fig. 2.



WITNESSES:
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(No Model.) 2 Sheets—Sheet 2.

P. H. BENADE.

TUBE CUTTER.

No. 412,944. Patented Oct. 15, 1889.

Fig. 3.

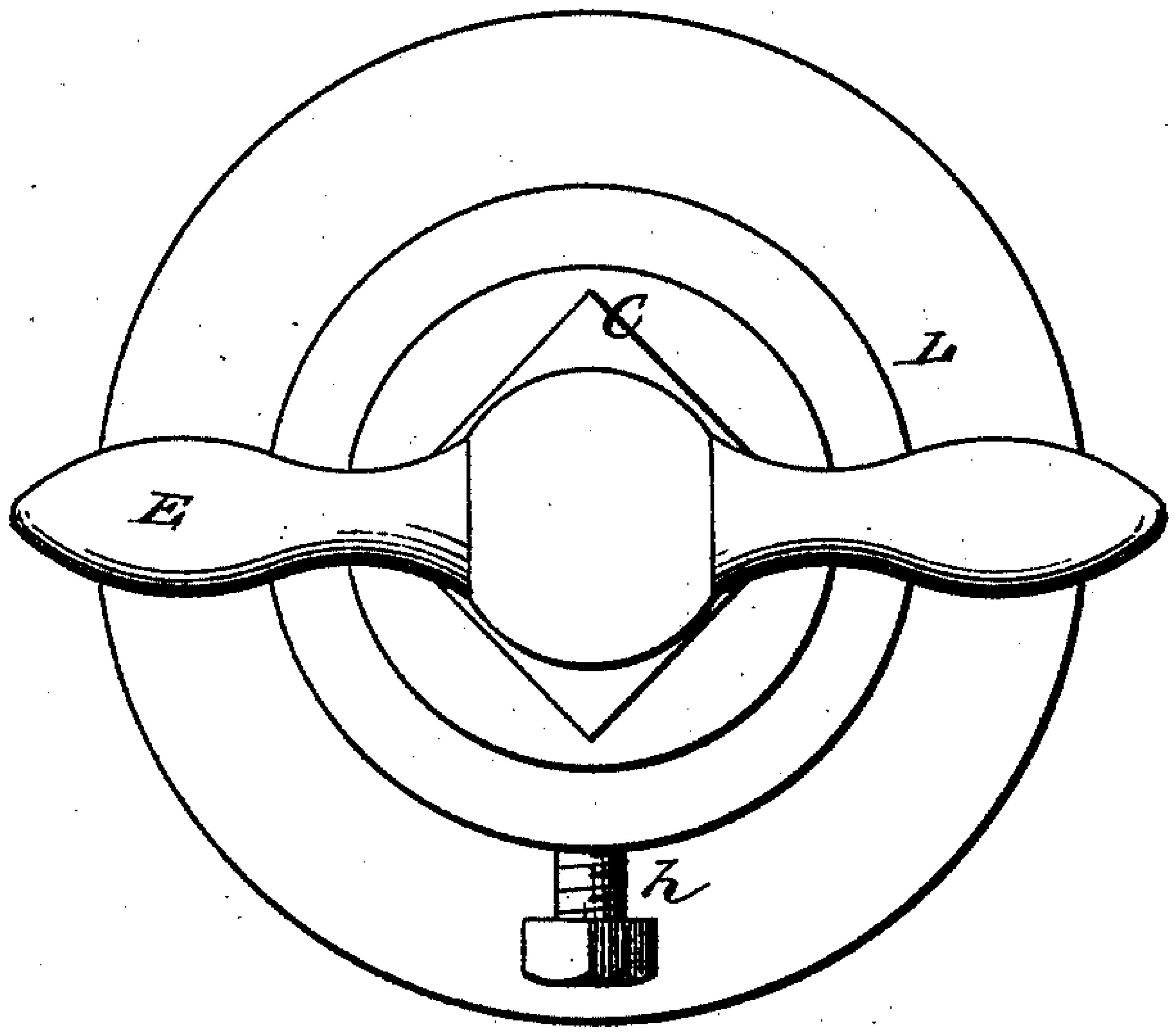
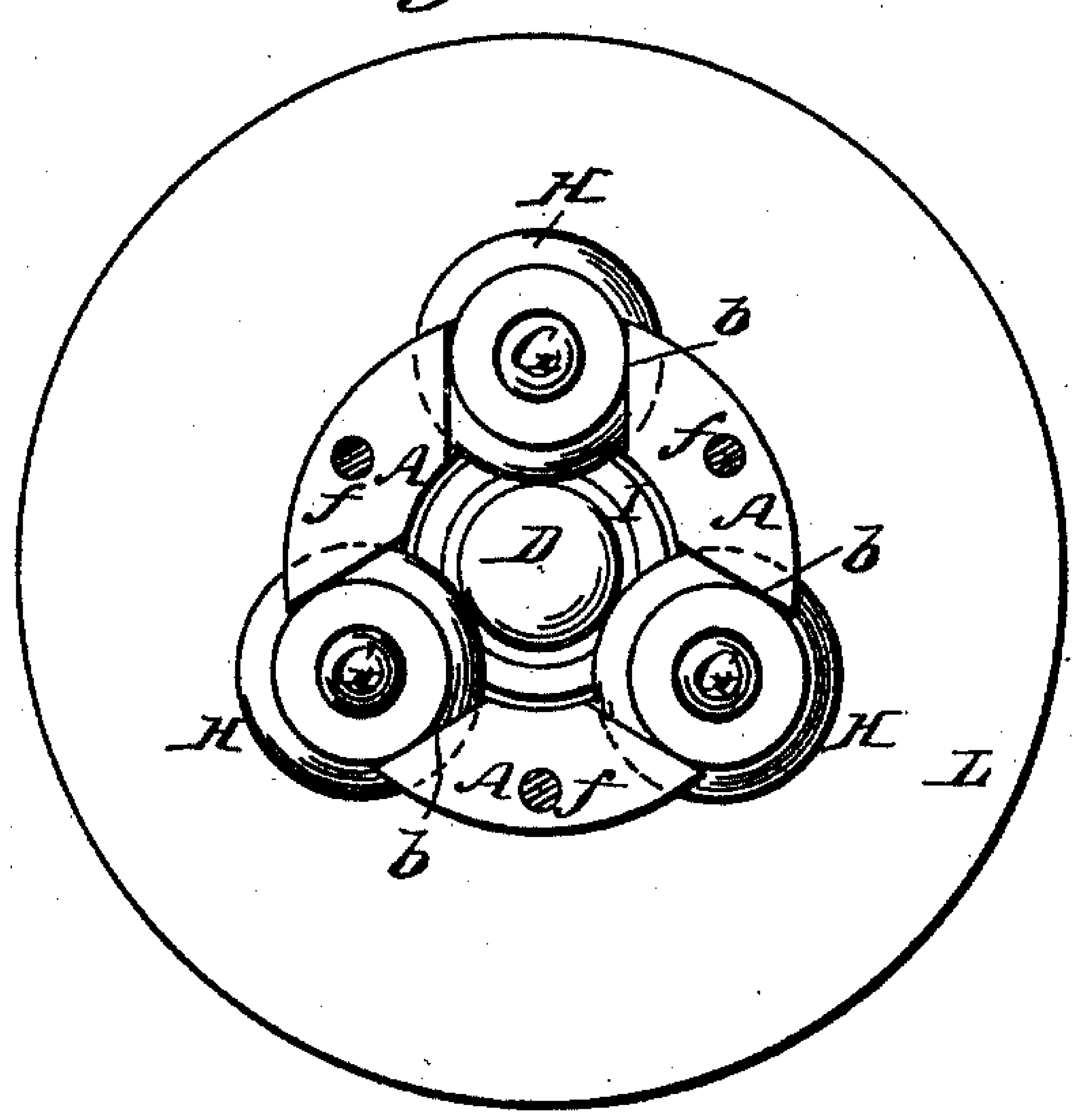


Fig. 4.



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UNITED STATES PATENT OFFICE.

PATRICK H. BENADE, OF PUNXSUTAWNEY, PENNSYLVANIA.

TUBE-CUTTER.

SPECIFICATION forming part of Letters Patent No. 412,944, dated October 15, 1889.

Application filed December 5, 1888. Serial No. 292,692. (No model.)

To all whom it may concern:

Be it known that I, PATRICK H. BENADE, of Punxsutawney, in the county of Jefferson and State of Pennsylvania, have invented a new and useful Improvement in Tube-Cutters, of which the following is a full, clear, and exact description.

This invention relates to that description of boiler-tube cutters or trimmers in which expansion-bars actuated by an adjustable wedge are used to throw a series of cutters radially outward, and in which independently-rotatable cutters are used, the feed or adjustment of the cutters being effected by a screw carried by and forming part of the rotatable tool.

The invention consists in certain novel constructions and combinations of parts in a tube-cutter embracing the above-named features, substantially as hereinafter described, and pointed out in the claim, whereby the cutters, which are peculiarly placed, have the power very effectually applied to them, and various-sized tubes may readily be cut with the same tool, and as the size of the latter increases so will its capacity to do the work.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a longitudinal view or elevation of a tube-cutter embodying my invention with a removable end guide adapted to fit within the tube to be cut detached. Fig. 2 is a longitudinal section of the same with said end guide attached. Fig. 3 is an outer or back end view of the tool; and Fig. 4, an inner end view, as at the line *x x* in Fig. 1, a plate for securing or holding the cutters in position and the end guide, above referred to, being removed.

A is the body of the tool, made hollow, as usual, and having two or more—preferably three, as here shown—longitudinal openings *b* made in it from its forward end to a suitable distance back to provide for the in-and-out movement of the cutters and the bars which carry them, as hereinafter described. The outer or back end of said body A is constructed with a shouldered recessed portion that has a screw-thread *c* cut in it, within which is fitted an externally and internally screw-threaded nut or box C of square or angular exterior shape on its outer end to adapt it to receive a wrench, by which to rotate the tool. This nut or box serves to receive within and through its internally-threaded aperture a screw D, provided with a handle E, which serves to feed the cutters against the inside of the tube to be cut. Said screw D also passes through a ring C′, arranged within the shouldered recessed portion of the body A at its inner end, which ring is recessed, as at *d*, to carry the cutter-bars G, that correspond in number and arrangement to the longitudinal openings *b* in the body of the tool. This ring C′, which also fits the screw-thread *c* of the body A, might be in one piece with the nut or box C; but it is made separate from it for the purpose of extending the tool any desired length, the screw D being of length to suit.

The cutters H are at the inner ends of the bars G, and are fitted to independently rotate within and through a milled opening *e* at the inner or forward end of each longitudinal slot or opening *b*, and which opening *e* is of a shape and size to make its walls fit the cutter on its sides or faces, so as to keep the cutter straight and insure its cutting-edge striking in the same line.

The cutter-bars G have a ball-and-socket fit within the independently-rotatable cutters H, and are also freely fitted at their back ends within the recess *d* of the ring C′ to insure a free action for the cutters without restraint by the cutter-bars; but both cutter-bars and cutters rotate by their fit through the body A in common with the tool when turned by a wrench applied to the nut or box C.

Upon the inner end of the screw D is suitably secured a beveled roller I, which as the screw is worked outward acts upon the inner faces of the cutter-bars G to force them and feed the cutters H outward.

On the inner end of the body A is secured, as by screws *f*, a plate J, which serves to hold the cutters in their places. This plate J is provided with a screw-threaded neck *g*, on which may be screwed a guide K of any suitable exterior diameter to fit snugly within the tube to be cut, said guide forming a solid fixture or appendage to the tool when in place,

but being detachable to provide for its replacement by guides of different sizes or diameters.

Upon the exterior of the body A is fitted loosely a collar or gage L, against which the end of the tube to be cut bears, and which may be secured in position on or along said body A, according to its distance required from the cutters, by a set-screw *h*.

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

In a tube-cutter, the combination, with a hollow body A, having longitudinal slots *b* and transverse openings *e*, the screw-box C, and a recessed ring C′, of the cutter-bars G, having their outer ends fitting in the recess of the ring, the cutters H, connected by a ball-and-socket joint with the inner ends of the bars G, and the screw D, provided with the roller I on its end, substantially as herein shown and described.

PATRICK H. BENADE.

Witnesses:
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JAS. I. GRUHL.