

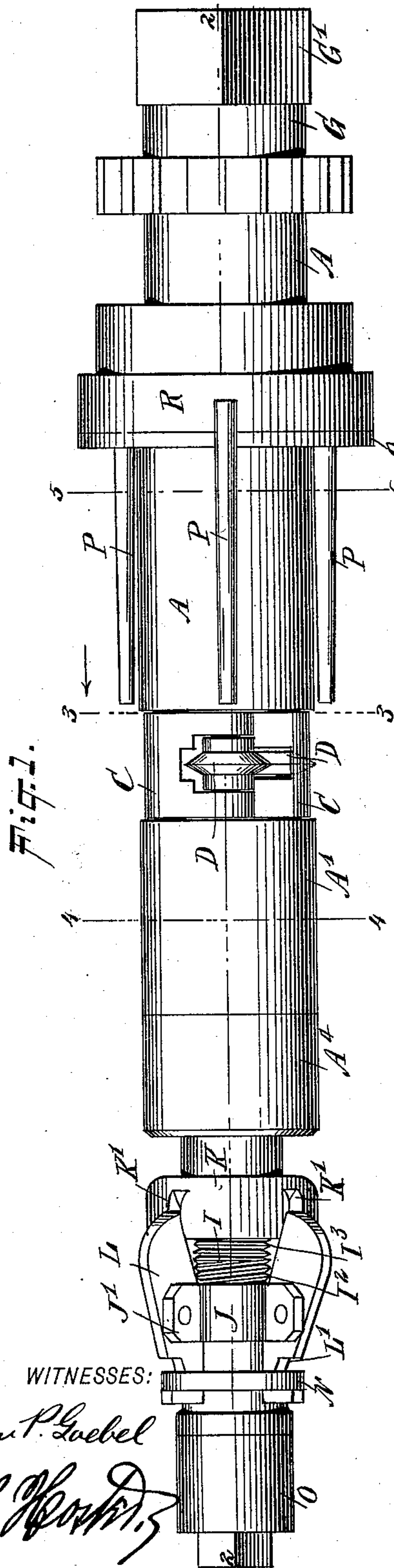
(No Model.)

2 Sheets—Sheet 1.

**P. H. BENADE.**  
**TUBE OR PIPE CUTTER.**

No. 549,841.

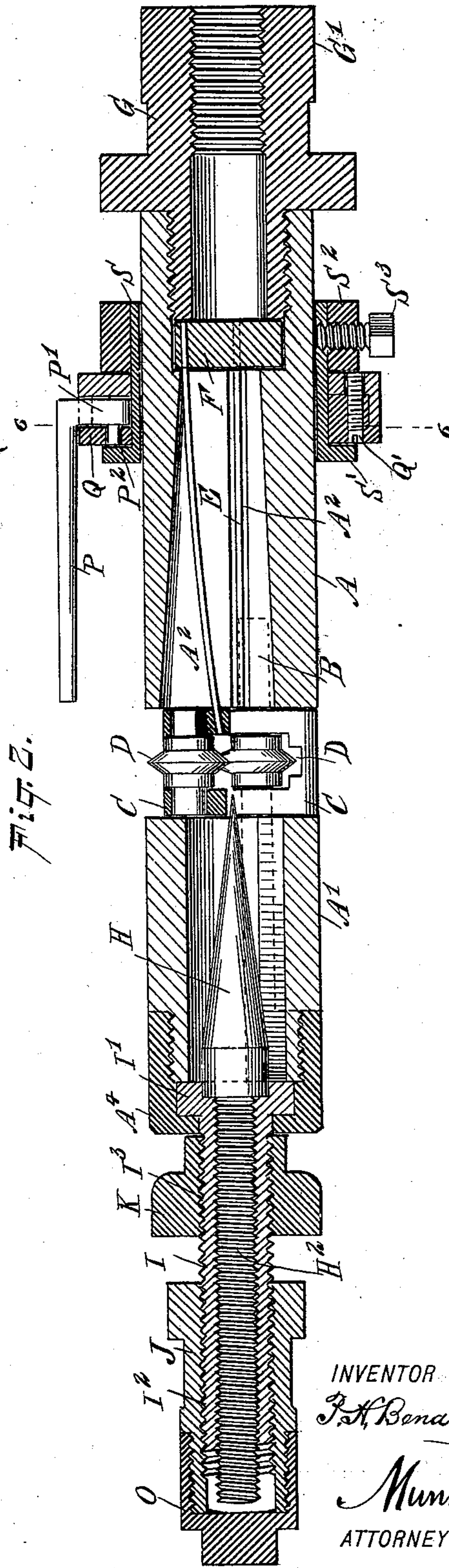
Patented Nov. 12, 1895.



WITNESSES:

William P. Gebel

Rev. J. Weston,



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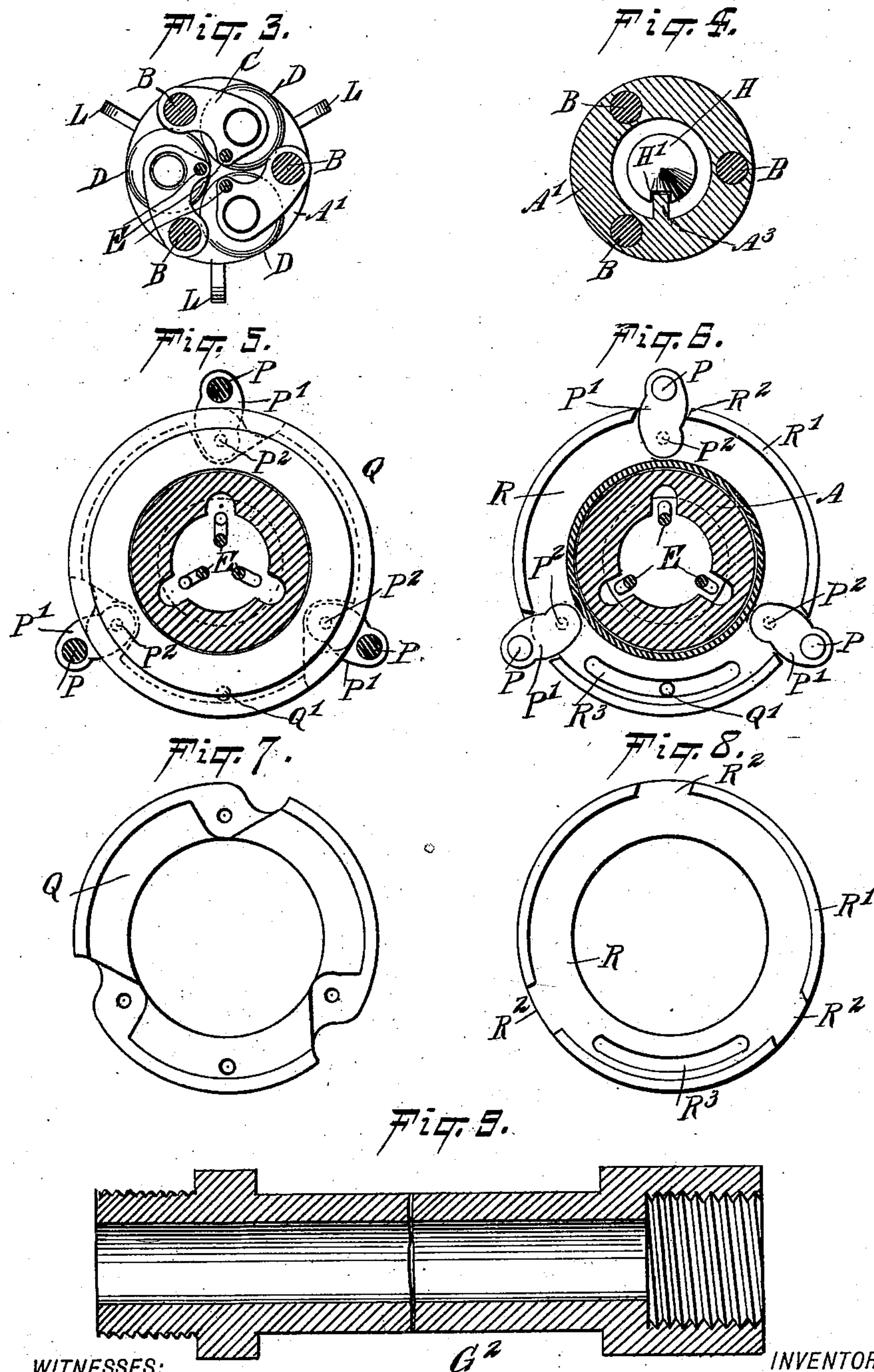
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2 Sheets—Sheet 2.

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TUBE OR PIPE CUTTER.

No. 549,841.

Patented Nov. 12, 1895.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

PATRICK H. BENADE, OF PUNXSUTAWNEY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ELLIS IRVIN ROGERS, OF SAME PLACE.

## TUBE OR PIPE CUTTER.

SPECIFICATION forming part of Letters Patent No. 549,841, dated November 12, 1895.

Application filed July 23, 1895. Serial No. 556,914. (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 Improved Tube or Pipe Cutter, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved tube or pipe cutter which is simple and durable in construction, very effective in operation, and arranged to securely hold the device in place during the cutting operation and to insure an automatic and positive feed.

The invention consists principally of cutters adapted to be engaged by a cone to press the cutters outward and into the work, the cone having a shank screwing in a sleeve with exterior right and left hand threads engaged by nuts carrying clamping-levers.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

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

Figure 1 is a plan view of the improvement. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a cross-section of the same on the line 3 3 of Fig. 1. Fig. 4 is a like view of the same on the line 4 4 of Fig. 1. Fig. 5 is a similar view of the same on the line 5 5 of Fig. 1. Fig. 6 is a like view of the same on the line 6 6 of Fig. 2. Fig. 7 is a face view of the disk for holding the gage-fingers. Fig. 8 is a similar view of a disk for moving the gage-fingers, and Fig. 9 is a sectional side elevation of an extension-head.

The improved tube or pipe cutter is provided with two cylinders A and A', placed suitable distances apart and connected with each other by rods B, arranged in a circle and placed equal distances apart, as plainly indicated in Figs. 3 and 4. On the rods B are fulcrumed the frames C, extending loosely between the adjacent ends of the cylinders A and A' and forming journals for the cutter-wheels D, adapted to cut a pipe or tube.

Each frame C is engaged by the free end of a spring E, extending along a recess A<sup>2</sup>, formed on the inside of the cylinder A to connect at its outer end with a collar F, set in a recess in the cylinder A and secured therein by screwing up the head G, provided on its outer end with a polygonal offset G' to permit of applying a wrench on the head G to turn the cylinders A and A' and carry the frames C along, the latter being swung outward by a cone H to move the cutting-edges of the wheels D in engagement with the pipe or tube. Normally the springs E hold the frames C inwardly, whereby the cutting-edges of the wheels D do not extend beyond the peripheral surface of the cylinders A A', so as to permit of conveniently placing the latter in the pipe or tube to be cut.

The cone H extends centrally in the cylinder A' and rotates with the latter, and at the same time has a longitudinal movement therein, the cone being provided with a longitudinal keyway H', engaged by a feather-key A<sup>3</sup> on the inside of the cylinder A'. Thus when the latter is turned the cone H is rotated with it, and at the same time is free to be fed forward to move with its apex in engagement with the three frames C to swing the latter outwardly against the tension of the springs E.

The base of the cone H is provided with a threaded shank H<sup>2</sup>, screwing in a sleeve I, provided at its forward end with a head I', fitting against the end of the cylinder A' and held loosely thereon by a cap A<sup>4</sup>, screwing on the said cylinder A'. The sleeve I is provided with a right-hand external screw-thread I<sup>2</sup>, adjacent to which is arranged a left-hand screw-thread I<sup>3</sup>, and both threads are engaged by nuts J and K, respectively, of which the nut J is provided with lugs J', on which are fulcrumed the clamping-levers L, adapted to engage the inside of the tube or pipe to clamp the nuts in place.

The free end of each lever L engages a longitudinal groove K' in the nut K, and the rear ends of the said levers are provided with notches L', engaged by a helical spring N for pressing the free ends of the levers forwardly and outwardly in engagement with the inner surface of the tube or pipe to be cut.



A cap O screws at the rear end of the nut J to protect the shank H<sup>2</sup>, as well as the sleeve I, from dust, shavings, &c.

On the cylinder A is arranged a gage provided with gage-fingers P, adapted to set the cutters D to the proper point at which the tube or pipe is to be cut off, the said fingers being adapted to rest against the end of the boiler or other device on which the tubes are employed. Each finger P is provided with an arm P', having a pivot-pin P<sup>2</sup> engaging an aperture in a disk Q, on which is mounted to turn a second disk R, formed with a flange R', having recesses R<sup>2</sup> for the passage of the arms P'. The disk R is also provided with a segmental slot R<sup>3</sup>, into which projects a pin or screw Q', held in the other disk Q.

The purpose of opening and closing the fingers P is to keep said fingers as close to the tube as possible loosely. As the tool is adapted to cut several sizes, should the fingers be made rigid, to suit the largest size of tube to which the tool is adapted, the gage would have to be removed in many cases on the smaller sizes on account of the closeness of the tubes to the side and crown sheets inside of the fire-box.

Now by reference to Fig. 5 it will be seen that when the operator turns the disk R it will cause a swinging of the arms P', carrying the fingers P, so that the latter will move outwardly or inwardly away from or toward the cylinder A, according to the direction in which the disk R is turned.

Both disks Q and R are mounted loosely on a sleeve S, formed at one end with a flange S', abutting against the outer face of the disk Q. On the other end of the sleeve S is held a collar S<sup>2</sup>, engaged by a set-screw S<sup>3</sup>, also screwing through the sleeve S, so as to engage the cylinder A and securely hold the collar, and with it the gaging device, in position on the cylinder A. By loosening the screw the collar S<sup>2</sup>, with the gage, can be shifted lengthwise on the cylinder A to the desired position to bring the cutting-wheels D to the point at which the pipe is to be cut. The set-screw S<sup>3</sup> is then screwed up to fasten the gage in place.

The operation is as follows: When the several parts are in the position shown in Fig. 2 and the device has been inserted in the tube or pipe to be cut, to bring the cutting-edges of the wheels D opposite the point at which the tube is to be cut off the operator by turning the wrench or other tool applied to the head G causes the cylinders A and A' to revolve and the nuts J and K to screw toward each other on the sleeve I. In doing so the free ends of the levers L travel up the inclined bottoms of the notches K', so that the free ends of the levers move very firmly in contact with the inner surface of the pipe or tube. When this has been done, a further turning of the cylinders A and A' will cause the shank H<sup>2</sup> in the sleeve I, held in a locked position by the nuts J and K, to screw in the said sleeve, and consequently feed the cone H forward in en-

gagement with the frames C to move the cutting-edges of the disks D in engagement with the inner surface of the pipe or tube. As the turning continues, the cutting-wheels D are carried around, and at the same time are fed outwardly, so as to finally cause a complete cutting off of the pipe.

It is understood that the cone H steadily advances on the turning of the cylinders, the cone at the same time turning with the cylinder A', owing to the feather-key A<sup>3</sup> engaging the keyway H'. When the tube or pipe has been cut, the wrench or other tool is turned in the opposite direction, so as to cause a return movement of the cone H and a final turning of the nuts J and K away from each other to release the clamping-levers L from the pipe and permit of withdrawing the entire tool from the cut-off pipe.

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

1. A tube or pipe cutter provided with outwardly movable cutters and having means of rotation at its outer end, a longitudinally movable cone in the inner end for projecting the cutters and automatically operated clamping devices at the inner end of the tool to engage the interior of the tube to be cut and cause the cone to be moved forwardly and backwardly according to the direction in which the tool is rotated, substantially as described.

2. A tube or pipe cutter, provided with cutters journaled on pivot frames, a cone adapted to engage the said frames to swing the same outwardly and to press the cutters into the work, the cone having a threaded shank, a sleeve in which screws the said shank, whereby when the cone is rotated it screws in or out in the sleeve and moves in or out of engagement with the said pivot frames, and nuts screwing on exterior left-hand and right-hand threads on said sleeve, the nuts carrying clamping levers adapted to engage the inner side of the tube, and hold the said sleeve stationary, substantially as shown and described.

3. A tube or pipe cutter, provided with cutters journaled on pivot frames, a cone adapted to engage the said frames to swing the same outwardly and to press the cutters into the work, the cone having a threaded shank, a sleeve in which screws the said shank, and automatically operating clamps carried by the sleeve to engage the interior of the pipe to be cut and hold the sleeve stationary, whereby when the cone is rotated it screws in or out in the sleeve and moves in or out of engagement with the said cutter frames, and springs engaging the said cutter frames, to swing the latter inwardly on withdrawing the cone, substantially as shown and described.

4. A tube or pipe cutter comprising two aligned cylinders, rods connecting the adjacent ends thereof, swinging cutters pivoted on the rods, springs within the outer cylinder normally holding the cutters retracted, a cone within the inner cylinder and engaging the



said cutters to move them outwardly, said cone having a threaded shank, an internally threaded sleeve coupled loosely to the end of the inner cylinder and in which the cone shank is turned by the rotation of said cylinders, and clamping devices carried by the sleeve to engage the interior of the pipe to be cut and hold said sleeve stationary, substantially as described.

5. A tube or pipe cutter, comprising aligned cylinders connected with each other at their adjacent ends by rods, frames journaled on the said rods and each carrying a cutter wheel, a cone provided with a longitudinal key-way engaging a feather key in one of the said cylinders, the said cone being provided with a threaded shank, a sleeve held on one of the cylinders and in which screws the said shank, the said sleeve being provided at its outside with a right and a left-hand thread, nuts screwing on the said sleeve threads, and levers carried on one of the nuts and engaging inclined grooves on the other nut, substantially as shown and described.

6. A tube or pipe cutter, provided with a gage comprising two disks mounted to turn, fingers each provided with an arm having a pivot pin engaging one of the disks, the said arm of each finger passing through a notch

in the rim of the other disk, whereby when the latter is turned a swinging motion is given to the arms, substantially as shown and described.

7. A tube or pipe cutter, provided with a gage comprising two disks mounted to turn, fingers each provided with an arm having a pivot pin engaging one of the disks, the said arm of each finger passing through a notch in the rim of the other disk, whereby when the latter is turned a swinging motion is given to the arms, a sleeve carrying the said disks, and a set screw for fastening the sleeve in place, substantially as shown and described.

8. A pipe cutter comprising two aligned cylinders, rods connecting the adjacent ends thereof, swinging cutters pivoted on said rods, a collar in the outer end of the outer cylinder, springs extending therefrom to the cutters to hold them normally retracted, an operating head screwed into the outer end of the said outer cylinder and holding said collar in place and means for projecting the cutters as the cylinders are rotated, substantially as described.

PATRICK H. BENADE.

Witnesses:

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J. M. DAVIS.