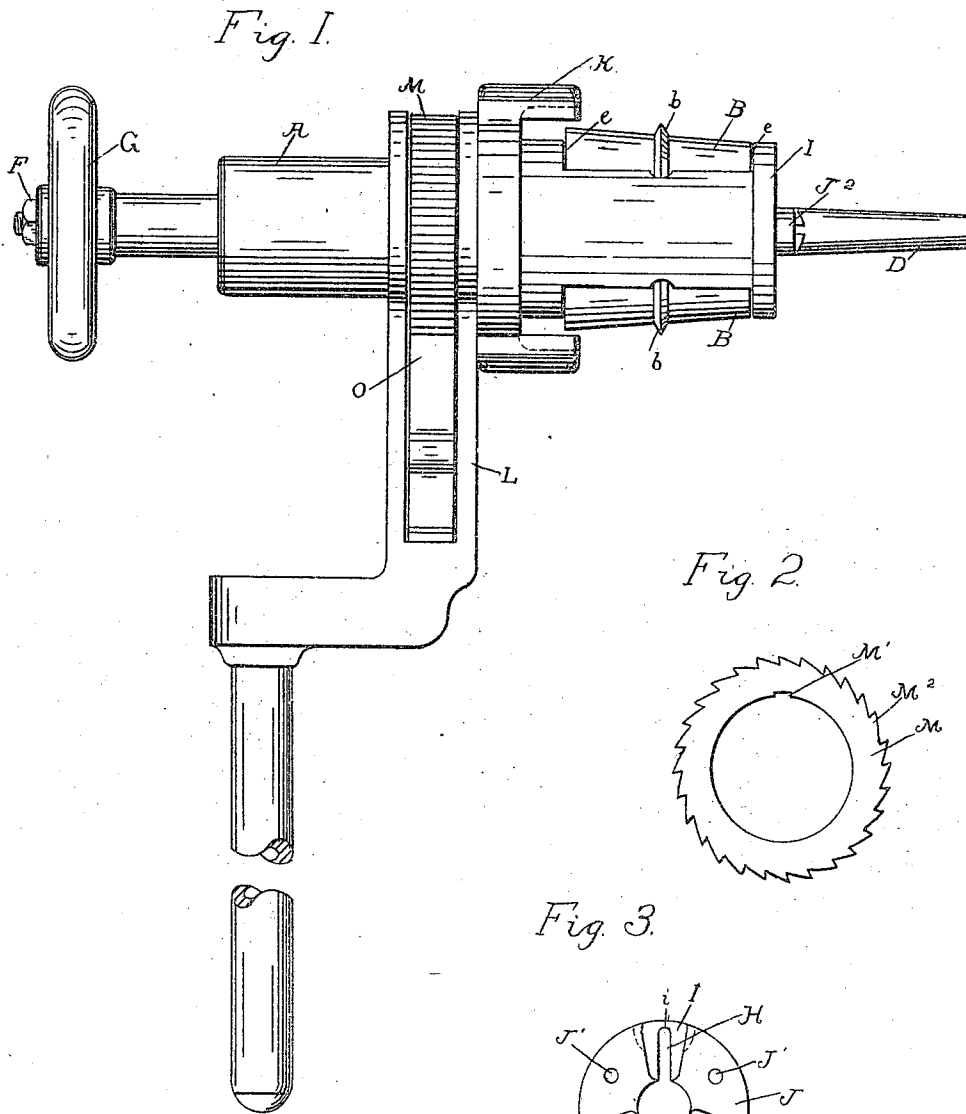


F. M. ASHLEY.
TUBE CUTTER AND EXPANDER.
APPLICATION FILED MAY 11, 1906.

949,136.

Patented Feb. 15, 1910.

2 SHEETS—SHEET 1.



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Fig. 4.

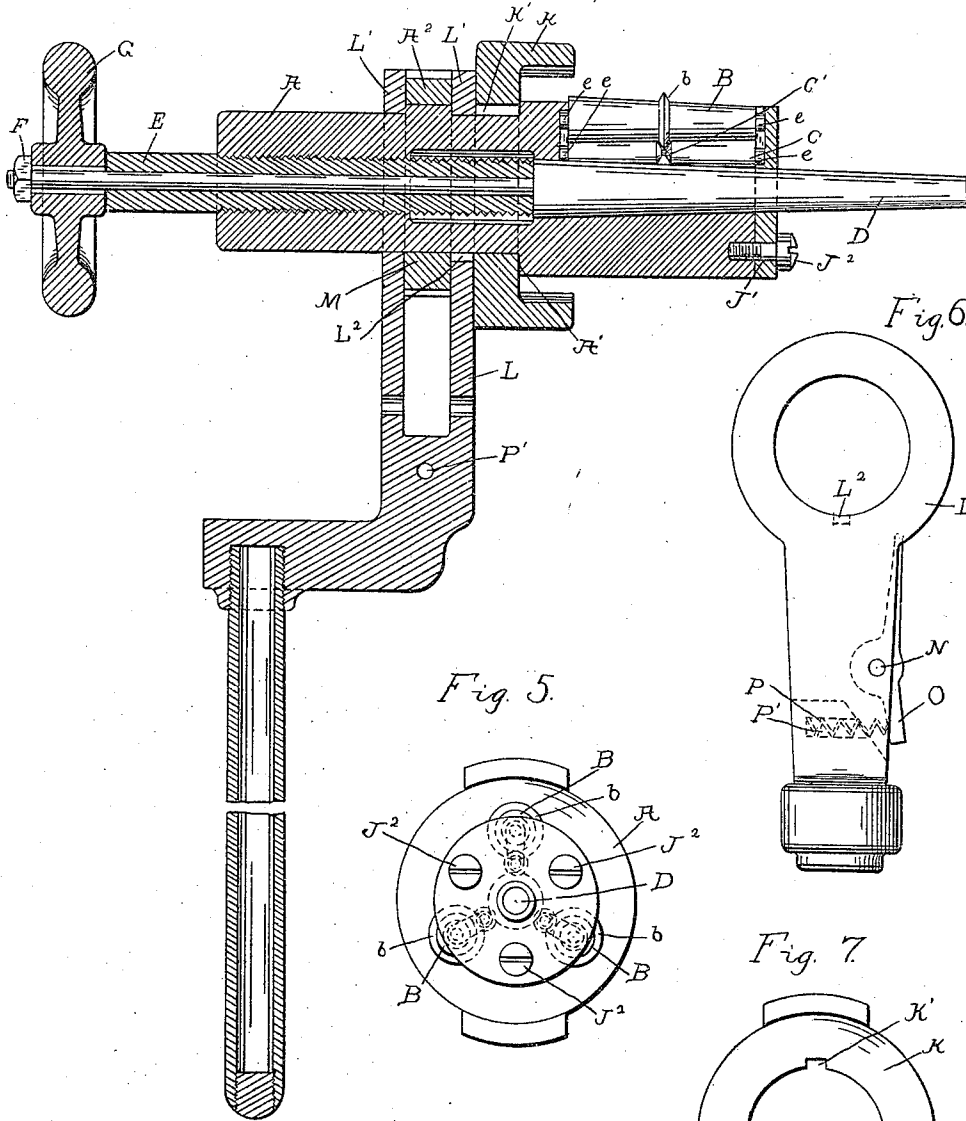


Fig. 6.

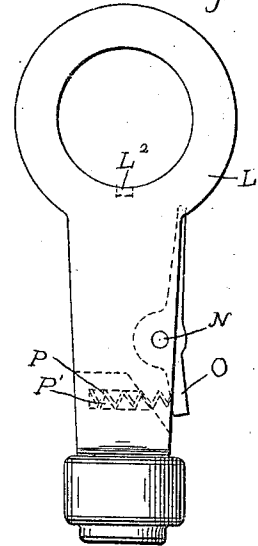


Fig. 5.

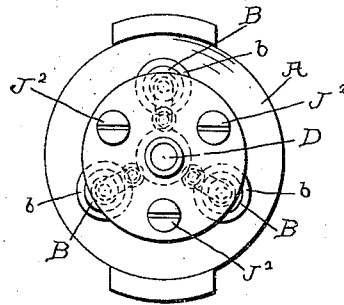
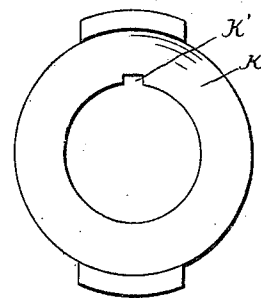


Fig. 7.



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TUBE CUTTER AND EXPANDER.

949,136.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed May 11, 1906. Serial No. 316,249.

To all whom it may concern:

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, and resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Tube Cutters and Expanders, of which the following is a specification.

The present invention relates to that type of tube cutters and expanders wherein the cutters and expanders may be either separately or coincidentally used, and also where the internal outwardly exerted force of a mandrel is transmitted to the cutters and expanders by intermediately located rollers. I provide a cutter and expander of the type referred to, which will not only prove highly efficient in operation, but which will permit the cutters, expanders and intermediate rollers to be adjusted, removed and interchanged with both convenience and expedition.

Referring to the drawings which form part of this specification, Figure 1. is an exterior view of the device when used as a tube cutter, showing the rolls provided with the cutters in position in the frame. Fig. 2. is a side view of the ratchet wheel. Fig. 3. is a view of the inner face of the end guide, which supports and guides the ends of the rolls. Fig. 4. is a central sectional view through the frame and showing the tapered spindle by means of which the rolls are forced outward against the tubes and around which the rolls revolve. Fig. 5. is an end view of the frame and rolls, exclusive of the lever. Fig. 6. is a face view of the lever, exclusive of the handle, and Fig. 7. is a face view of the support which engages the end of the tube to be cut or expanded.

A indicates the frame, which is preferably made of cast or malleable iron, and is provided with a central opening which is screw threaded to engage the sleeve E which may be made separate from the spindle as shown herein or may be made integral therewith if preferred. When made separate as shown, the spindle D may be removed by unscrewing the nut F and removing the sleeve E from the frame, and a spindle with a smaller diameter of the tapered part, may be inserted to allow a smaller tube to be cut than would be possible with the size shown. The sleeve E permits the use of two sizes of spindle with a single threaded sleeve, but if preferred, the sleeve may be dispensed with,

and the shank of the spindle made large enough to engage the thread in the frame directly, and where made in this way, the wheel G may also be made integral with the shank of the spindle if desired, thereby reducing the number of parts. The spindle is shown in its farthest position to the right with the rollers expanded to the outward limit of their travel.

The frame A is provided at its front end with lateral openings, three in number in the present case, intersecting the central longitudinal opening in the frame, and located in said openings are the rollers B—B—B, the cutting rollers being provided with the circular cutting edges *b—b—b*, and the expanding rollers being left plain, and under each of the rollers B is an intermediate roller C provided with a groove C' in which the projecting cutters on the rolls B may rest, and said rolls C act to transmit the pressure from the spindle D to the rolls B as will be readily understood.

It will be noted by reference to Fig. 4, that the intermediate rollers C, taper in a direction reverse to that of the conical part of the mandrel, while the cutter rollers B, which lie in contact with the rollers C, taper in a direction corresponding with the taper of said conical part of said mandrel. This insures a uniform contact between the inner and outer rollers and the inner rollers with the mandrel and at the same time insures an outward pressure being exerted on the rollers B, with gradually increasing force. Where expanding rollers are employed, these will taper in a direction the reverse of that of said mandrel part.

The ends of the rollers B and C are provided with small cylindrical projections *e—e—e* which rest at one end in the frame A in corresponding guide ways to those in which the opposite ends rest, which form is shown at H—H—H in Fig. 3. and located in the end washer J. The large ends of the rolls are supported in the wide guide-ways I—I—I—, and the rolls are prevented from rolling out of the casing by the shoulders *i—i—i—* against which the small cylindrical projections *e—e* etc., abut when in their farthest outward position as shown. The washer is held to the frame by screws J² which are inserted through holes J' in said washer, and engage with threads in the frame A.

K is the frame support which engages the

projecting end of the tube to be cut or expanded, and is provided with a key way K' for the purpose hereinafter set forth. It is also provided with the circular central opening which is of the proper diameter to slidingly fit the shank of the casing A as shown, and abuts against the casing at A'.

L is the lever, the end which engages with the frame A being bifurcated as shown and provided with a circular opening L' in which the shank of the frame A slidingly fits, and is also provided with a key way L² for the purpose hereinafter specified.

M is the ratchet wheel provided on its periphery with ratchet teeth M² and with a central opening of the same diameter as the shank of the frame A, over which it slides to its normal position as shown thereon, and is also provided with a key-way M' which engages with a key formed on the shank of the frame A and preferably made integral therewith as indicated by A², so that the ratchet wheel M when rotated, will also rotate the frame therewith.

Supported on a pivot N in the lever L is a pawl, the upper end of which engages the ratchet wheel M, and the lower end of which engages with a small spring P which rests in an opening P' in the lever, and acts to hold the upper end of the pawl in engagement with the wheel M.

The use of the key-ways K' and L² are to allow the support K and lever L to pass the key A² in passing them to their respective positions on the frame A, which is done by bringing the key-ways in alinement with the key A² and sliding the key-way over the key A², and this arrangement dispenses with the necessity of small parts which are liable to be lost and also make a stronger key than an inserted key would be.

The device is operated by inserting the forward end of the frame in the tube to be cut or expanded, with the taper spindle in its extreme position to the left, and by screwing the taper spindle forward in the frame A, the rolls will be forced outward in contact with the inner periphery of the

tube to be cut, and by working the ratchet lever, the ratchet wheel and frame will be rotated, carrying the rolls therewith, and cutting or expanding the tube as the case may be, in a manner well known to the art.

The advantage ensuing from the particular arrangement of roller bearings provided by the frame A, and the washer J, is that by simply removing said washer and having the conical part of the mandrel in proper position, the rollers can be readily and conveniently adjusted, removed or interchanged, without the necessity for disturbing any other part of the tool. The washer, when secured, will contribute to the positive retention of the rollers in position.

In view of the simplicity of the device, and clearness of the drawings, it is believed that further description is unnecessary.

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

1. A device of the character described comprising a frame having rolls supported therein one above the other, said rolls being tapered and arranged with the narrow end of one roll opposite the large end of the adjacent roll, means for guiding said rolls in said frame and means for forcing said rolls outward from the center of the frame.

2. A device of the character described comprising a frame provided with openings in which a plurality of pairs of rollers are supported one above the other, each pair comprising a groove and projection, and being tapered relative to each other and arranged with the narrow end of one roll opposite the large end of the adjacent roll, means for forcing said rolls outwardly from the center and means for rotating said frame.

Signed at New York city in the county of New York and State of New York this 16th day of February A. D. 1906.

FRANK M. ASHLEY.

Witnesses:

WM. BODGE,
FRANK L. SEAVER.