

July 21, 1925.

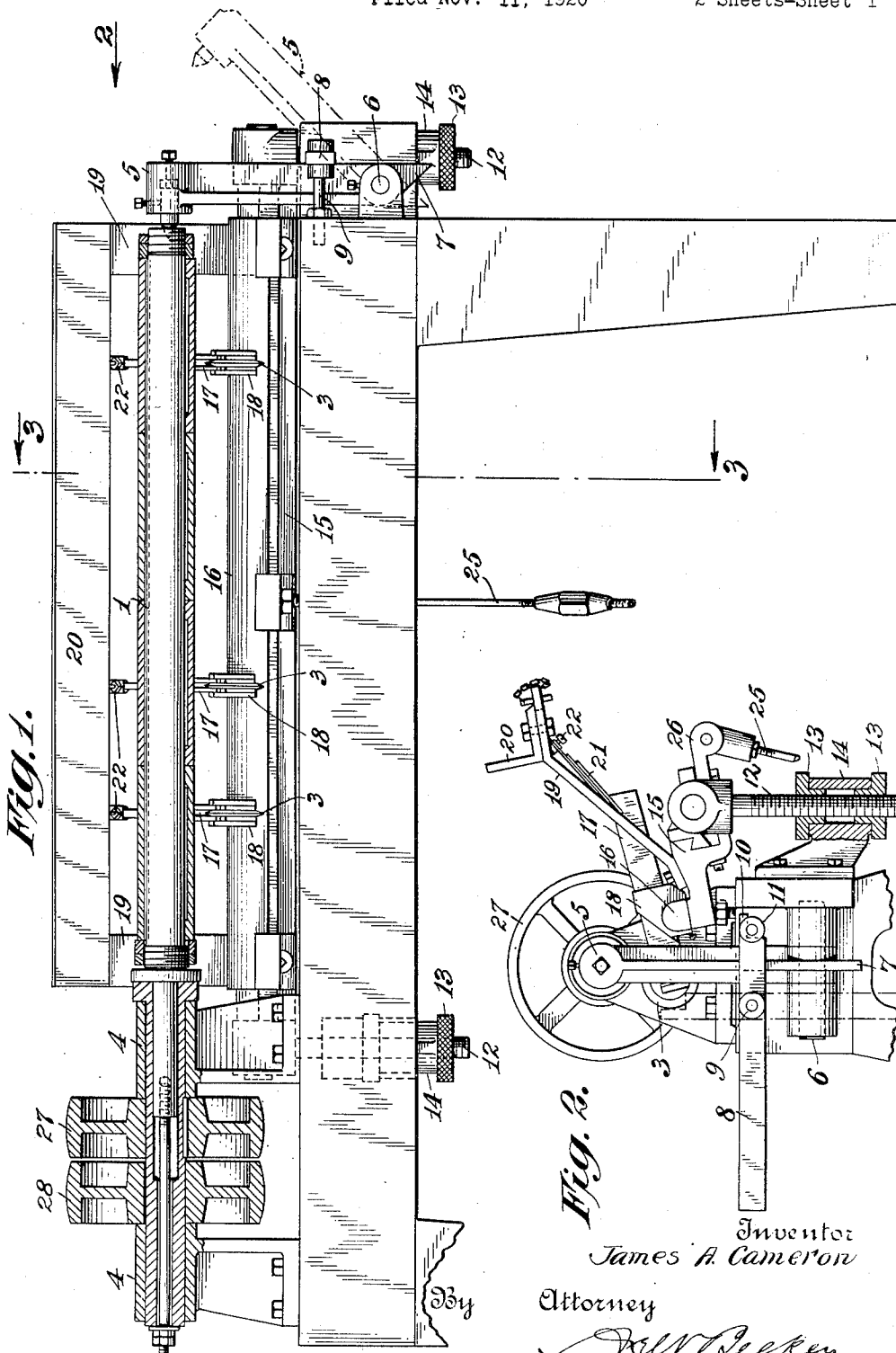
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1,546,564

METHOD OF AND MEANS FOR CUTTING TUBES

Filed Nov. 11, 1920

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Fig. 4.

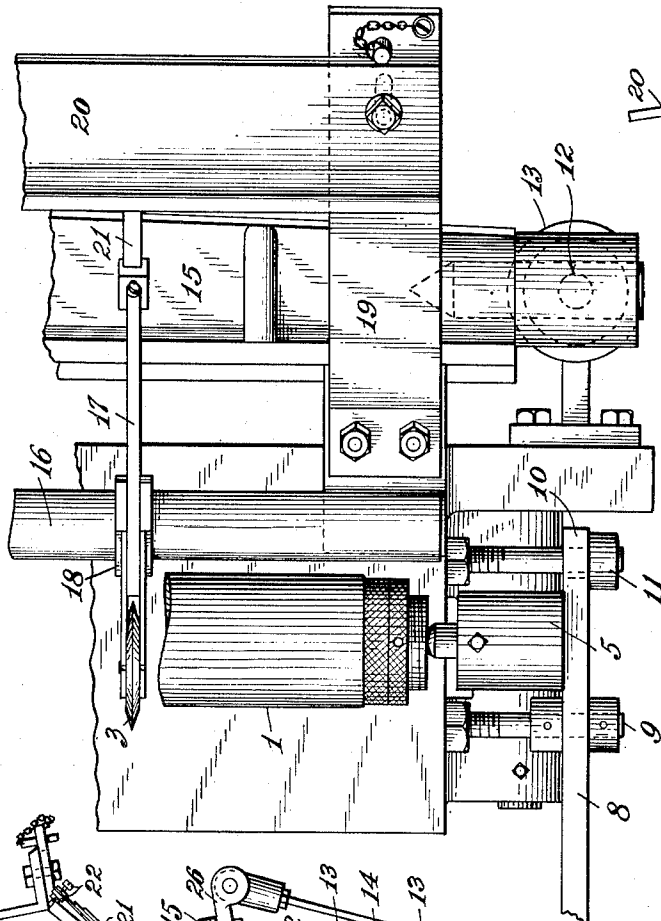
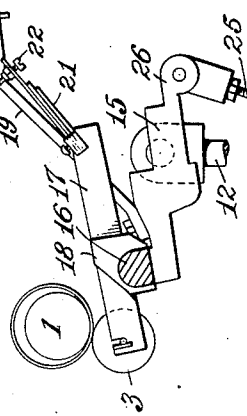
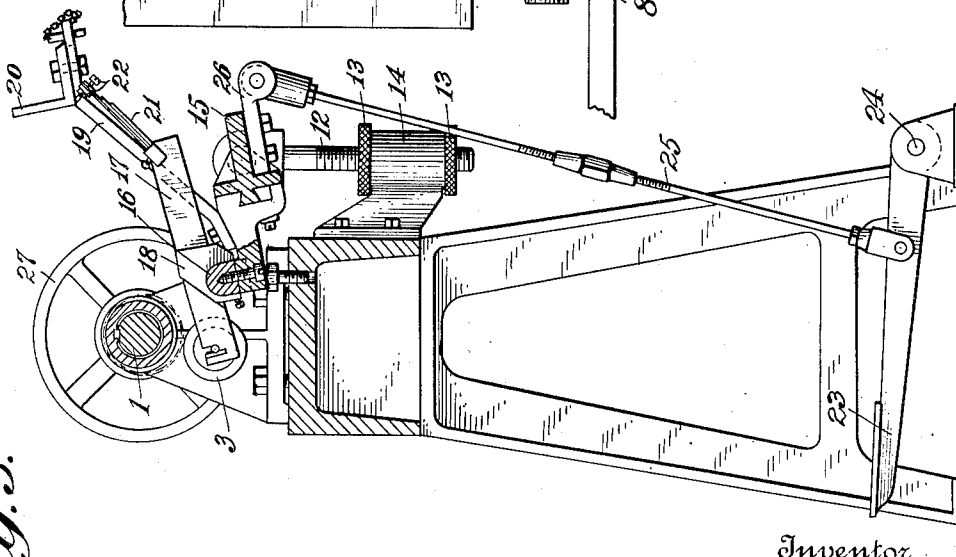


Fig. 5.

Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## METHOD OF AND MEANS FOR CUTTING TUBES.

Application filed November 11, 1920. Serial No. 423,273.

*To all whom it may concern:*

Be it known that I, JAMES A. CAMERON, a citizen of the United States, and a resident of the city of New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Methods of and Means for Cutting Tubes, of which the following is a specification.

This invention relates to tube cutting machines, and has for its main object and feature an improvement whereby it will not be necessary to change the size of the mandrel for different sizes of tubes. It is the present practice in the art of tube cutting to use a mandrel or core for mounting the tube when cutting same into arbitrary lengths, which core fits the inside diameter of the tube, there being a separate mandrel for each diameter of tube, and this core has heretofore been made of a soft metal, usually brass or bronze, and the action of the cutters has been to score circumferential rings or depressions in its soft surface, with the result that the severed edge of the tube so cut is depressed into these rings and made rough and the inside diameter of the tube at this point is therefore slightly smaller than at any other point, and this is a decided disadvantage.

In the accompanying drawings the invention is disclosed in a concrete and preferred form in which—

Fig. 1 is a front elevation, partly broken away and in section, of a machine embodying the invention:

Fig. 2 is a fragmentary end elevation, partly in section, looking in the direction of arrow 2 of Fig. 1:

Fig. 3 is a vertical sectional view on the plane of line 3—3 of Fig. 1:

Fig. 4 is a top plan view of one end of the machine:

Fig. 5 is a more or less diagrammatic end view of the upper part of the machine.

1 indicates a rotatable mandrel consisting preferably of an inner core and outer hardened sleeves capable of resisting cutting action of score cutters 3 so that the latter will not cut circumferential grooves therein. This mandrel is supported at one end in bearing 4 capable of sustaining the weight of the mandrel. 5 indicates a second bearing pivotally supported at 6 and capable of being swung out of the way as indicated in

dotted lines in Fig. 1, so that a tube may be readily introduced on the mandrel. Outward movement of bearing 5 is limited by stop 7, and 8 indicates a latch pivotally supported at 9 on the framework and adapted to have its end 10 pass behind roller 11 so as to retain said bearing in endwise engagement with the mandrel. 12 are two upright standards supported by adjustable nuts 13 in sleeve 14 bolted to the framework. Pivotally supported on these standards is a rocking supporting member 15 that extends parallel with the mandrel. Carried by said supporting member is a rail 16 also parallel with the mandrel, said rail having a rounded top, as shown, to pivotally support cutter holders 17. To space the cutter holders properly, endwise guides 18 are provided, said guides being adjustably secured to rail 16. Cutters 3 of the character known as score cutters are rotatably mounted on the cutter holders. Carried by rocking member 15 are two rearward extensions 19 to which is adjustably secured an abutment member 20 that extends parallel to the rail and mandrel. Springs 21 are interposed between the ends of the cutter holders and the abutment member. The tension of the spring of each cutter holder may be individually adjusted by means of screw 22 or otherwise. 23 is a foot pedal supported at 24 and connected by means of rod 25 and arm 26 with rocking member 15. 27 and 28 indicate fast and loose pulleys on the mandrel.

Normally, gravity will move the cutter parts into the position shown in Fig. 3, but when the pedal is depressed, member 15 will rock on its pivotal support thereby causing the cutters to engage a tube on the mandrel and thereafter causing a turning movement of the cutter holders on the curved surface of the rail 16. This causes the tension of springs 21 to be increased so that each cutter is held against the mandrel with individual spring pressure.

Pressing the cutters into engagement with the tube will cause the latter to be pressed against the rotating mandrel and due to this fact the tube will follow the rotation of said mandrel and the paper or other material of which the tube is made will be severed.

Heretofore it has been customary to have the tube fit the mandrel snugly and to insert a mandrel of proper diameter when

cutting different diameters of tubes. With the arrangement shown this is unnecessary because if a tube of larger diameter than that of the mandrel is introduced on the  
 5 mandrel, the cutters will press a part of the inside periphery of the tube against said mandrel and will properly support the tube during the cutting action. To insert a tube on the mandrel or to remove the severed  
 10 rings, bearing 5 is moved into the dotted line position shown in Fig. 1.

I claim:

1. A tube cutting machine comprising: a  
 15 rotatable mandrel, bearings for said mandrel admitting of endwise introduction of a tube on the mandrel while the latter is supported by one of said bearings, score cutters engaging the tube to sustain it against the mandrel at the point of cutting and to effect the cutting operation, and means for rotating the  
 20 mandrel at will.

2. A tube cutting machine comprising: a rotatable mandrel to loosely receive a tube, and score cutters engaging the outside of the  
 25 tube to effect rotation of the tube on the mandrel and cutting thereof by pressing a part of its inside periphery against the mandrel.

3. A tube cutting machine comprising: a  
 30 rotatable mandrel to loosely receive a tube, and score cutting means to engage the outside of the tube to effect rotation of the tube on the mandrel and cutting thereof by pressing a part of its inside periphery against  
 35 the mandrel.

4. A tube cutting machine comprising: a rotatable mandrel, bearings for said mandrel admitting of endwise introduction of a tube on the mandrel while the latter is sup-

ported by one of said bearings, a rocking  
 40 support, a plurality of cutter holders pivotally supported on the rocking support, rotatable cutters in said cutter holders, means for actuating the rocking support, and in-  
 45 dividually adjustable spring means for placing the cutters under increasing tension by continued movement of the rocking support after the cutters engage the tube.

5. A tube cutting machine comprising: a rotatable mandrel, a bearing at one end of  
 50 said mandrel capable of sustaining it even when unsupported at its other end, a bearing at the other end of the mandrel to additionally support the same during rotation  
 55 thereof, means for rocking said second bearing endwise of the shaft to admit of introduction of a tube on the mandrel while the latter is supported by the first bearing, and cutters to coact with the mandrel to cut the  
 60 tube thereon.

6. The method of cutting a tube into sections which consists in mounting the tube  
 65 loosely on a rotatable mandrel, and then pressing part of its inside periphery against the mandrel to thereby rotate and cut the tube.

7. The method of cutting a tube into sections which consists in mounting the tube  
 70 loosely on a rotatable mandrel, and then pressing part of its inside periphery against the mandrel, while the mandrel rotates, to thereby rotate the tube on the mandrel and cut it.

Signed at the Borough of Brooklyn, in the county of Kings, city and State of New  
 75 York, this 9th day of November, 1920.

JAMES A. CAMERON.