

No. 812,435.

PATENTED FEB. 13, 1906.

R. C. MONTEAGLE.
PROCESS FOR HELICALLY GROOVING TUBES.
APPLICATION FILED APR. 29, 1904.

Fig. 1.

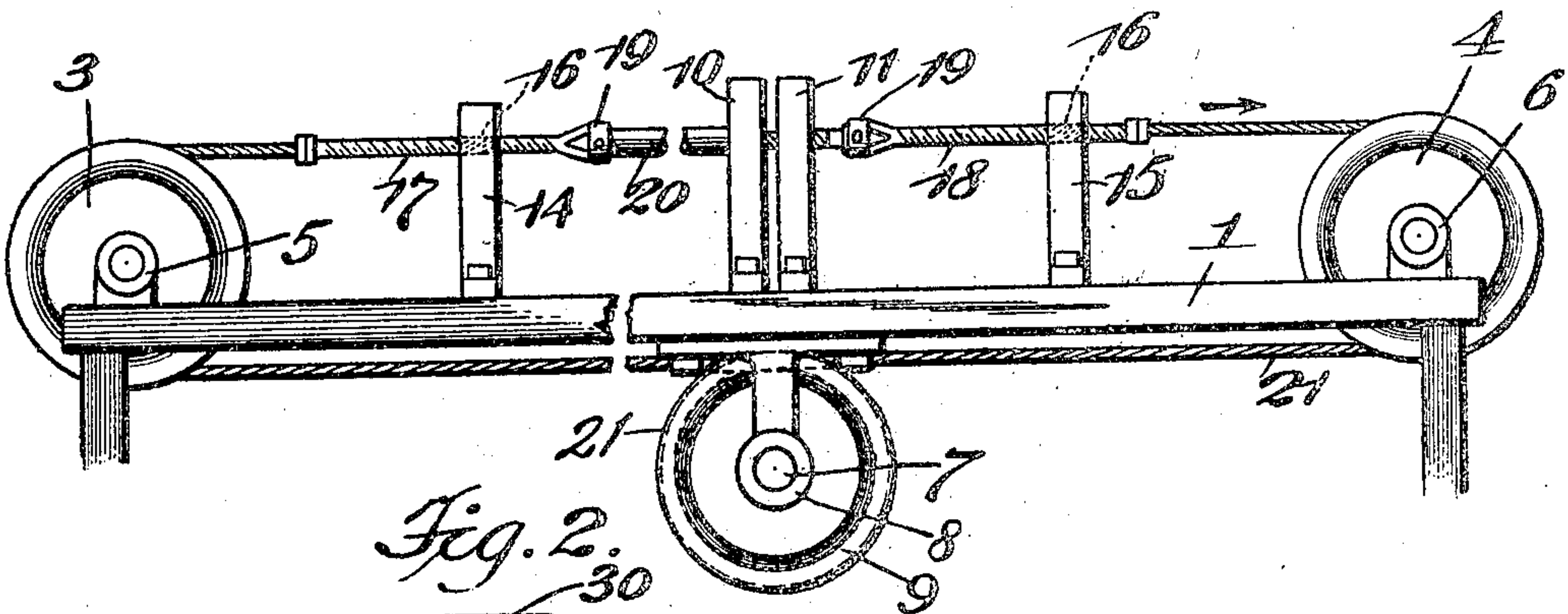


Fig. 2.

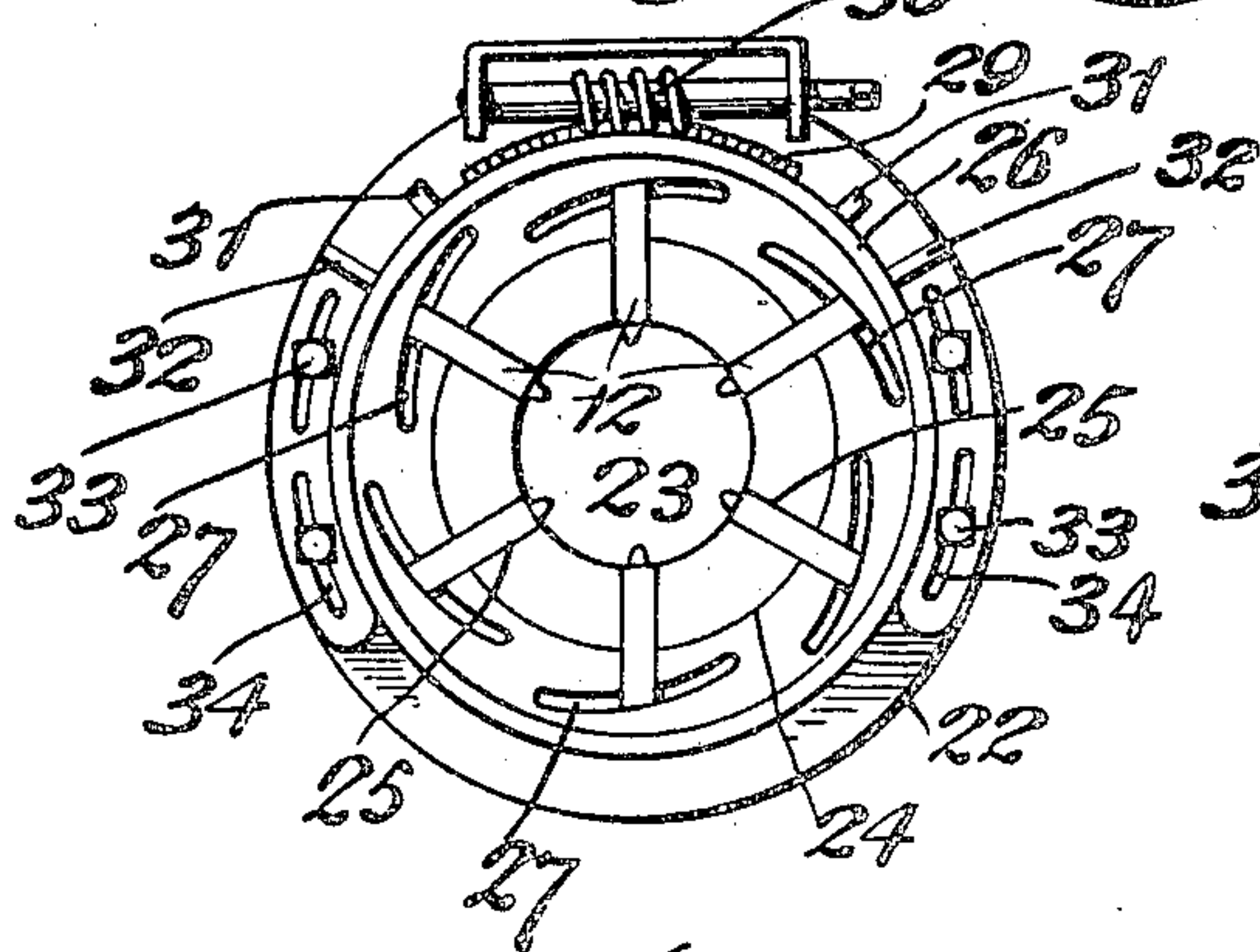


Fig. 3.

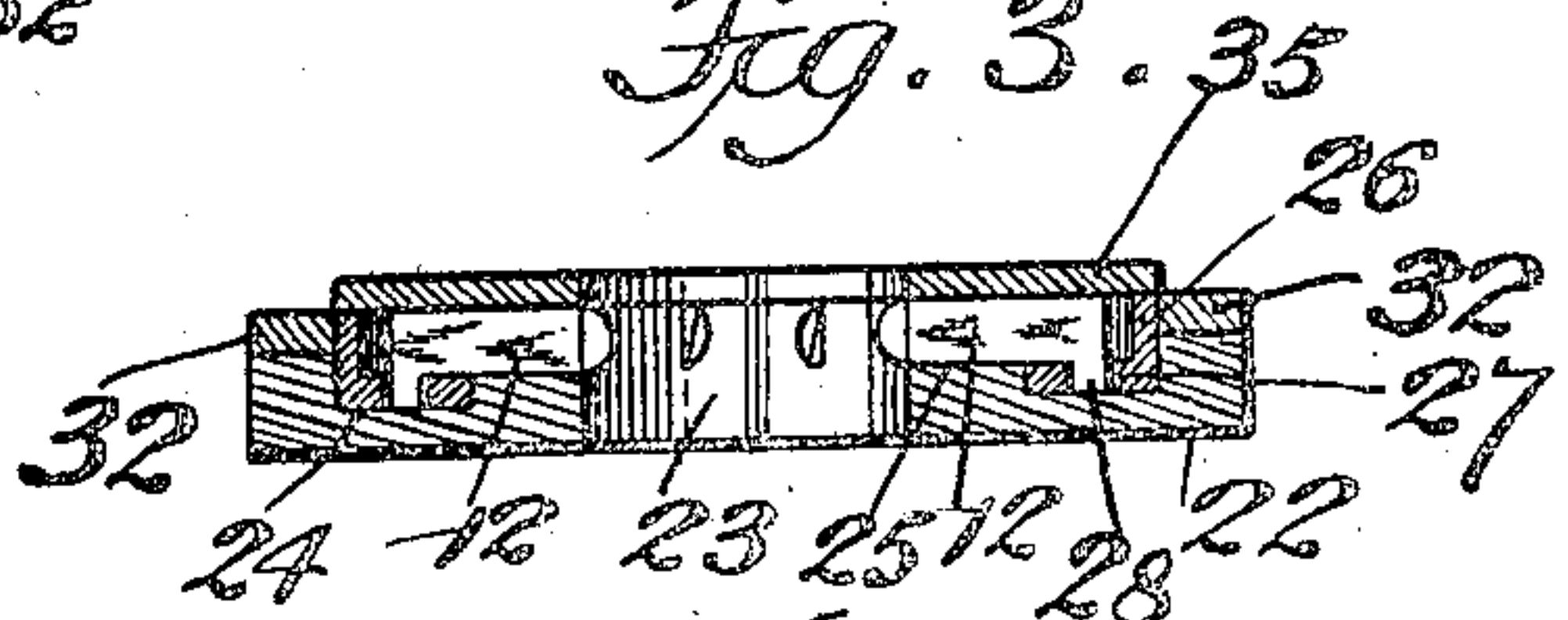


Fig. 7.



Fig. 4.



Fig. 5.



Fig. 6.



Fig. 8.

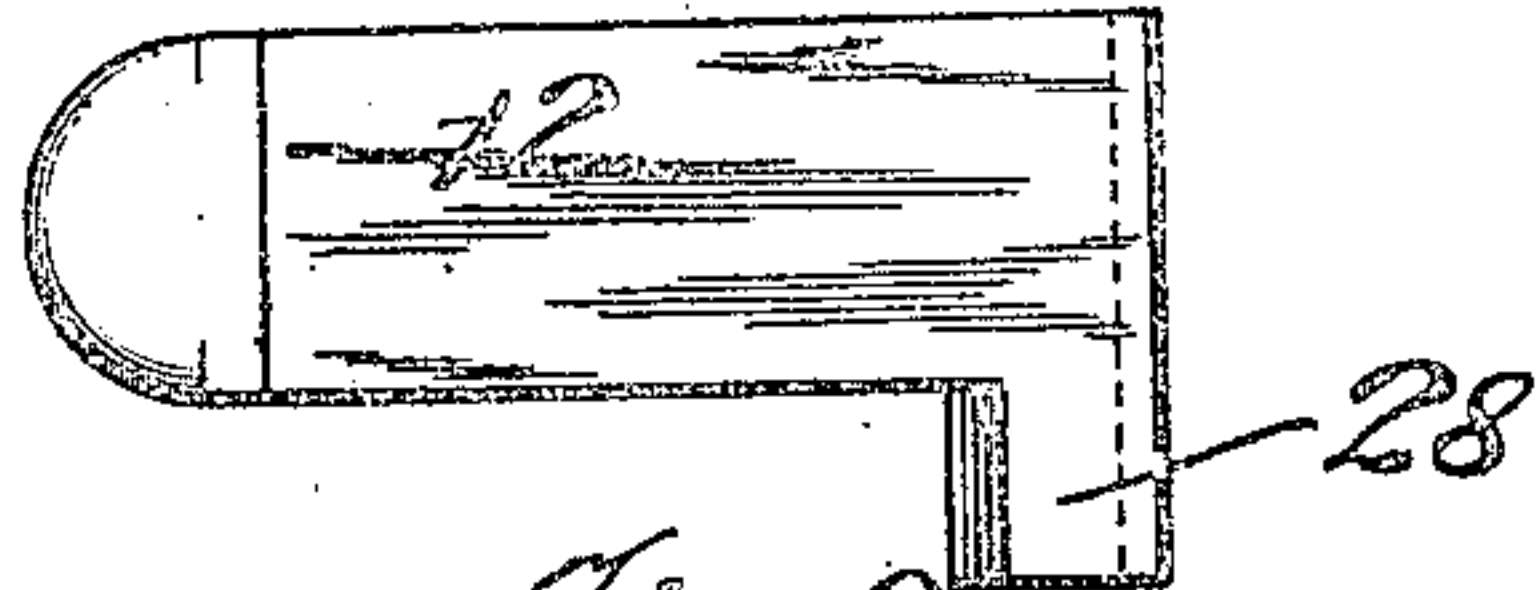


Fig. 9.

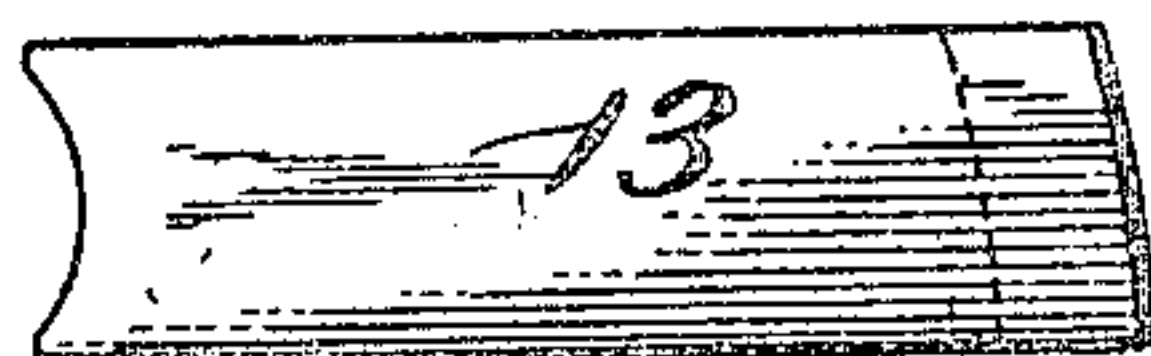


Fig. 10. Inventor
Robert C. Monteagle.

By his Attorney,

J. R. Little

Witnesses
A. R. Applegate
B. Molitor

UNITED STATES PATENT OFFICE.

ROBERT CHARLES MONTEAGLE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO EMMA MANN VYNNE, OF NEW YORK, N. Y.

PROCESS FOR HELICALLY GROOVING TUBES.

No. 812,435.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed April 29, 1904. Serial No. 205,492.

To all whom it may concern:

Be it known that I, ROBERT CHARLES MONTEAGLE, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Processes for Helically Grooving Tubes, of which the following is a specification.

My invention relates to processes for grooving tubes.

It has for its object to provide a simple effective process for helically grooving tubes.

The leading point of my process consists in simultaneously rotating and moving a tube lengthwise and in contact with dies having a fixed stationary position with relation to the lengthwise movement of the rotating tube.

My process further consists in first giving a plain tube of the required size a rotary and longitudinal movement between dies designed to form helical grooves of the desired shape therein and leave plain unreduced end portions, (one passage of the tube between these dies being sufficient if the grooves are to be shallow, but if deep two or more passages will be required,) and, second, drawing this tube through dies having plain faces to reduce the diameter of the plain end portions.

My process may be conveniently carried out by the machine illustrated in accompanying drawings, which form the subject of a concurrent application.

In the drawings, Figure 1 is a side elevation of the machine, partly broken away near its center. Fig. 2 is an end view of one of the die-holders with the cheek-plate removed. Fig. 3 is a horizontal sectional view thereof. Figs. 4, 5, and 6 are views of the tube as it appears in the different stages of the operation. Figs. 7, 8, and 9 are detail views of the die for helically grooving the tube. Fig. 10 is a view of the plain die.

Corresponding parts in all the figures are denoted by the same reference characters.

Referring to the drawings, 1 designates the table of my machine, at the ends of the top of which grooved pulleys 3 and 4 are journaled in bearings 5 and 6, respectively, and centrally beneath the table a power-shaft 7 is journaled in bearings 8 and has a grooved pulley 9 secured thereon. The die-holders 10 and 11, having dies 12 and 13, respectively, are secured centrally side by side to the top of the table, and between said hold-

ers and the pulleys 3 and 4 are secured turning devices 14 and 15, having spirally-threaded holes 16, engaged by spirally-threaded rods 17 and 18, respectively, having clamps 19 on their inner ends adapted to clamp the ends of the tube 20 to be operated upon between them.

A flexible steel rope 21 is wound around the pulley 9, and one end is connected to the outer end of the rod 17 and the other end to the rod 18, and upon the revolution of the pulley 9 by power applied to the shaft 7 the rope will be pulled over the pulleys 3 and 4 in one direction, drawing the rods 17 and 18 through the turning devices 14 and 15 and the tube 20 through the dies 12 and 13 in the die-holders 10 and 11, and on account of the engagement between the turning devices and the rods passing therethrough said rods will be turned in their passage therethrough, thereby turning the tube 20 in its passage through the dies 12 and forming a helical groove therein.

Each die-holder consists of a stationary plate or member 22 and an oscillatory ring or member 26, the stationary member being provided with a hole 23 therethrough for the passage of the tube to be operated upon, and a circular groove 24 and radial grooves 25 in one face, and the oscillatory member, which is mounted in the circular groove 24 in the stationary member, has cam-grooves 27 in one face engaged by lugs 28 upon the outer ends of the dies whereby they are reciprocated, a segment of a worm-gear 29 on its periphery engaged by a worm 30, journaled on the stationary member, whereby the ring 26 is oscillated, and stops 31 also on its periphery adapted to come into contact with stop-plates 32 to regulate the movement of the ring 26, said stop-plates 32 being adjustably secured to the plate 22 by screws 33, projecting through elongated slots 34 therein and into holes in the plate 22, and a cheek-plate 35 is secured to the grooved face of the stationary plate 22.

In carrying out my improved process with the machine herein described the operation is as follows: Assuming that the parts are in the position shown in full lines, Fig. 1, with the dies 12 in operative position and the dies 13 out of operative position, upon the revolution of the pulley 9 to the left the tube 20 will be drawn through the dies 12 and turned in

its passage therethrough by means of the turning devices 14 and 15, thereby forcing the metal of the tube in and forming helical grooves of a depth and shape governed by the shape of the dies 12. This furnishes the first part of the operation if the grooves are to be shallow, but if they are to be deep the worm 30 is turned, forcing the dies 12 farther in, and the pulley 9 is then turned to the right, drawing the tube back through the dies and leaving it in the condition shown by Fig. 5 with a helically-grooved portion and unreduced end portions. To finish the operation, the dies 12 are then thrown out of operative position and the plain-faced die 13 thrown into operative position, after which the tube is drawn through the dies 13, which draw down the unreduced end portions, leaving the tube in its completed condition. (Shown by Fig. 6.)

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

1. A process for helically grooving tubes, consisting in giving a plain tube a simultaneous lengthwise and rotary movement between suitable dies to form a series of helical grooves in an intermediate portion and leave

plain end portions and then giving this resultant product a lengthwise and rotary movement between suitable dies to reduce said plain end portions.

2. A process for helically grooving tubes, consisting in giving a plain tube a simultaneous lengthwise and rotary movement between suitable dies to force in portions thereof to form a series of helical grooves in an intermediate portion and leave plain end portions and then giving this resultant product a lengthwise and rotary movement between suitable dies to reduce said plain end portions.

3. A process for helically grooving tubes, consisting in giving a plain tube a simultaneous lengthwise and rotary feed between dies to form a series of helical grooves therein and leave plain end portions and then reducing the end portions.

In testimony whereof I have signed my name in the presence of the subscribing witnesses.

ROBERT CHARLES MONTEAGLE.

Witnesses:

D. C. Fox,
B. L. MOLITOR.