

No. 788,292.

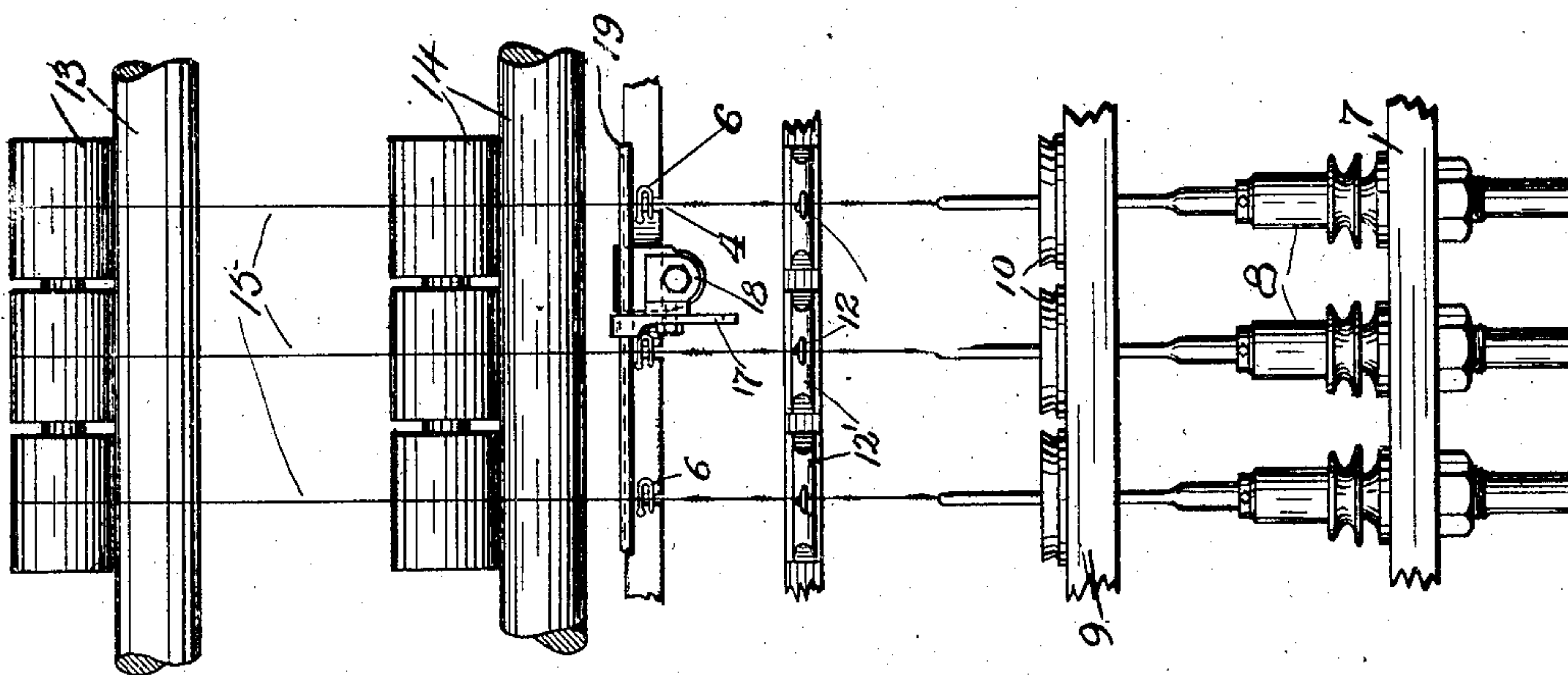
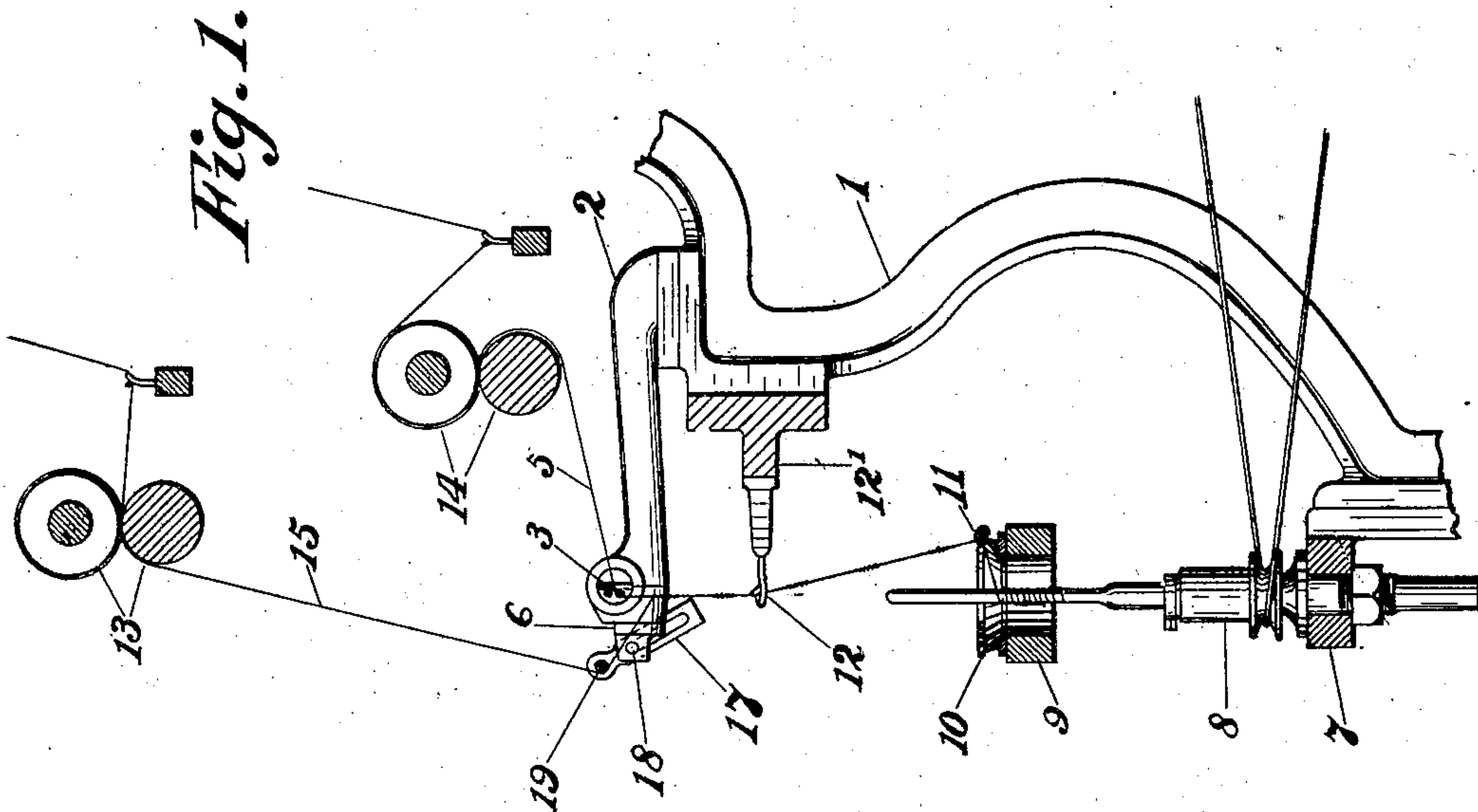
PATENTED APR. 25, 1905.

J. S. VERLENDEN.

MACHINE FOR TWISTING AND DOUBLING YARNS.

APPLICATION FILED AUG. 27, 1904.

3 SHEETS—SHEET 1.



WITNESSES:

*Edu. W. Vaile Jr.*  
*Harry C. Kennedy.*

*Fig. 2.*

INVENTOR  
*Jacob S. Verlenden*  
BY  
*Wm. C. Ellis*  
ATTORNEY.

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Fig. 3.

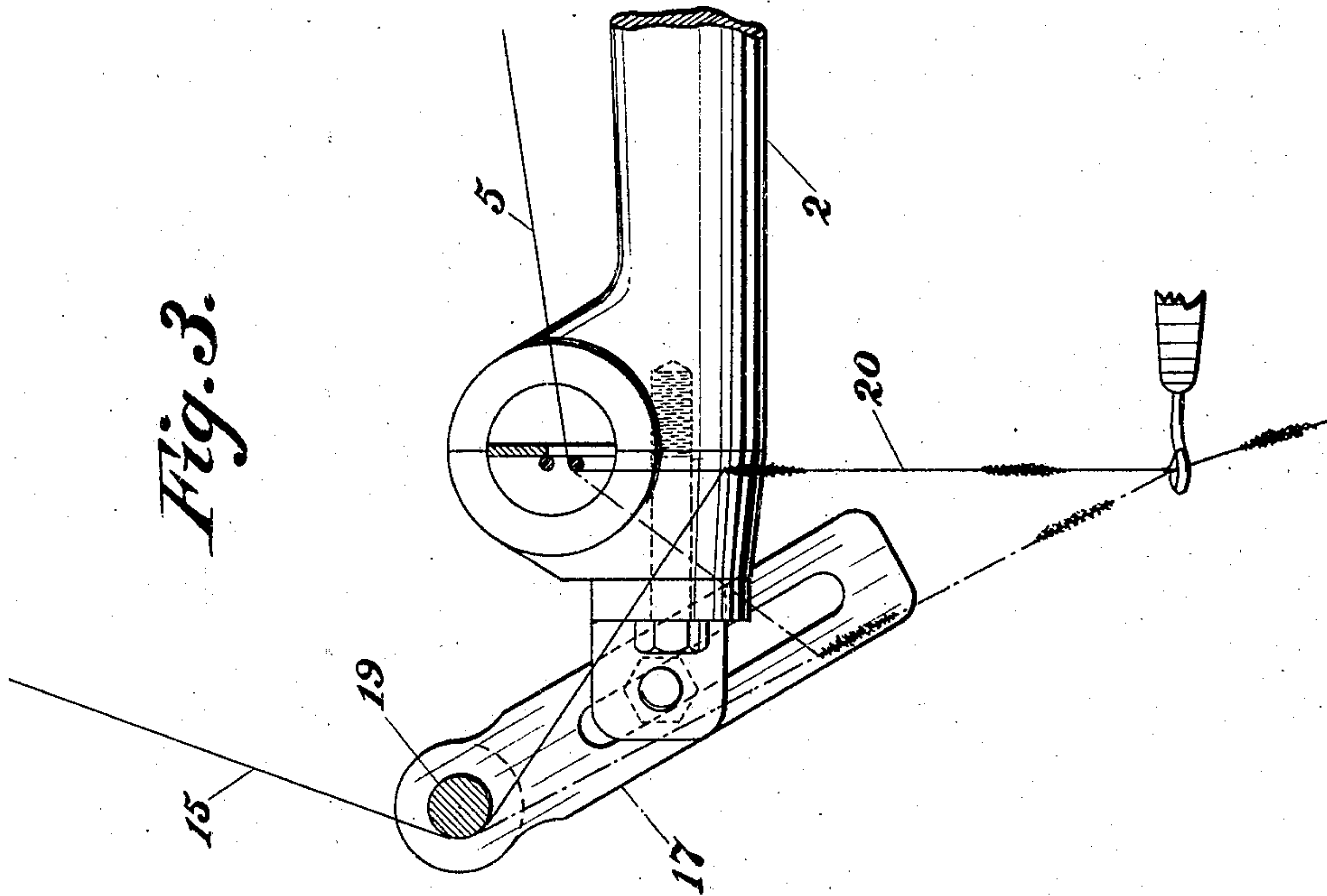
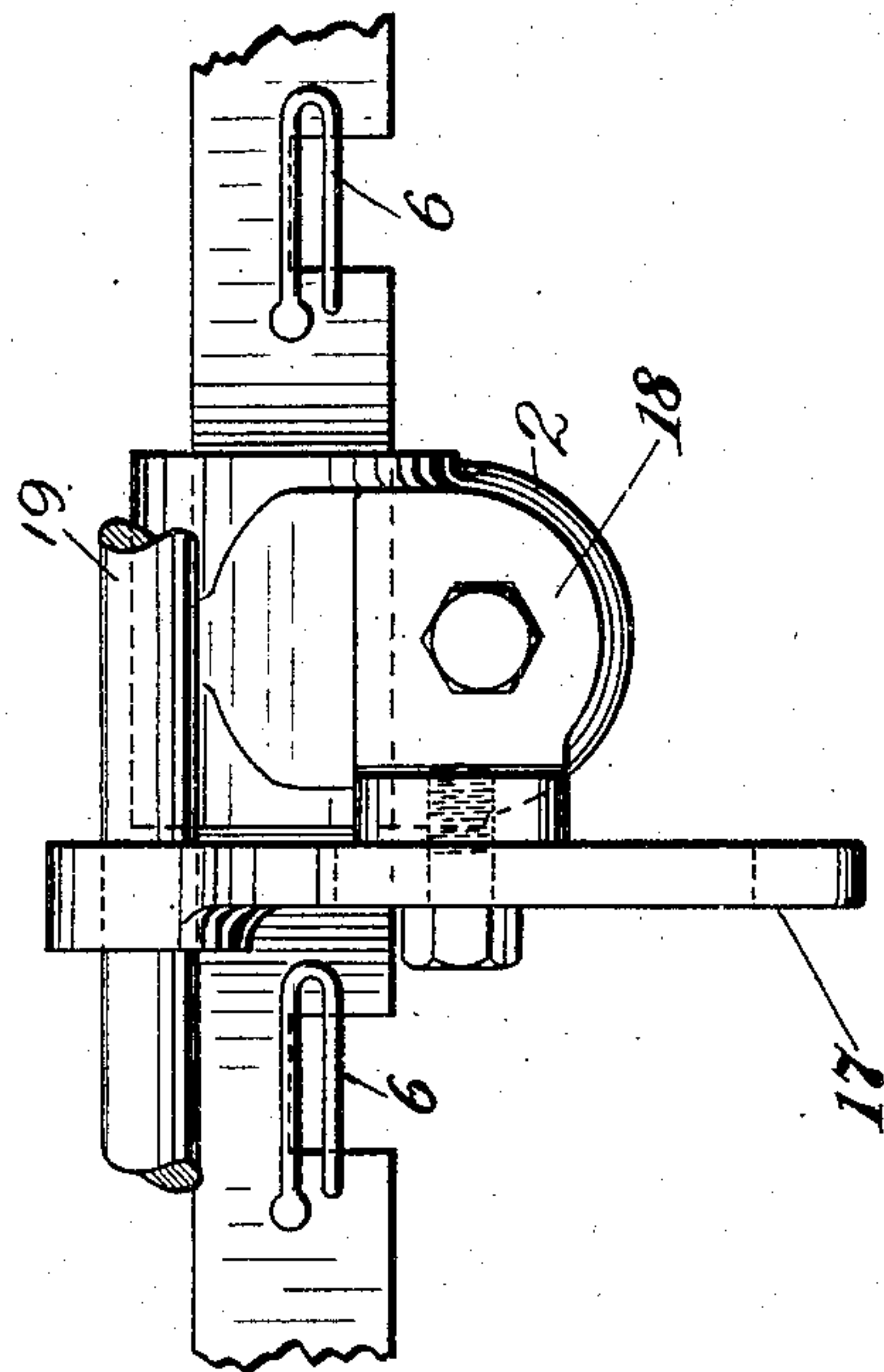


Fig. 4.



WITNESSES:

Edward W. Vaile Jr.  
Harry Cobb Kennedy.

Jacob S. Verlenden  
INVENTOR  
BY  
H. M. Pettit.  
ATTORNEY.

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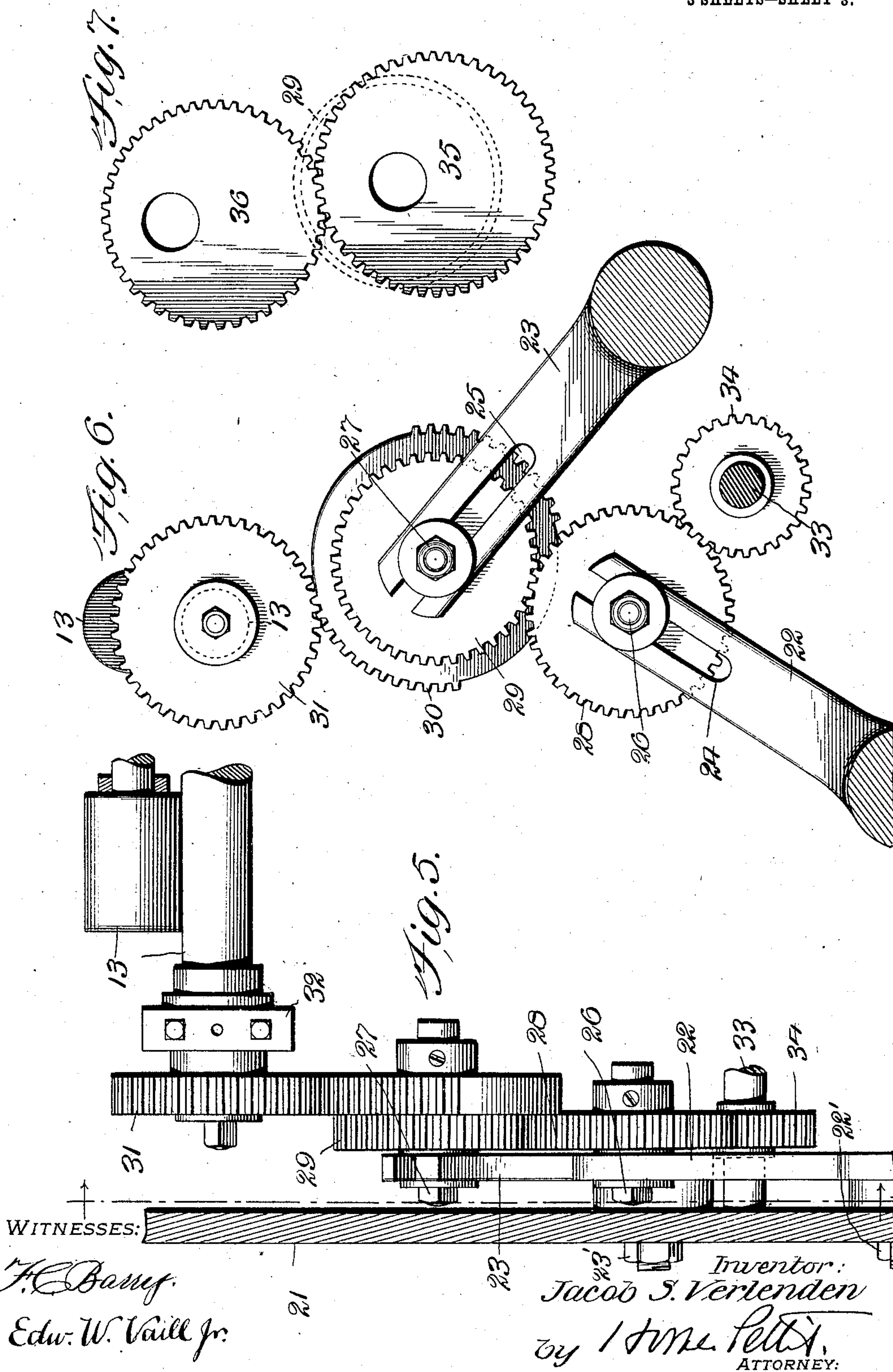
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3 SHEETS—SHEET 3.





# UNITED STATES PATENT OFFICE.

JACOB S. VERLENDEN, OF DARBY, PENNSYLVANIA.

## MACHINE FOR TWISTING AND DOUBLING YARNS.

SPECIFICATION forming part of Letters Patent No. 788,292, dated April 25, 1905.

Application filed August 27, 1904. Serial No. 222,370.

*To all whom it may concern:*

Be it known that I, JACOB S. VERLENDEN, a citizen of the United States, and a resident of Darby, county of Delaware, State of Pennsylvania, have invented certain new and useful Improvements in Machines for Twisting and Doubling Yarns, of which the following is a full, clear, and complete disclosure.

The object of my invention is the production of machines for twisting and doubling yarns, either of cotton or wool, which in addition to twisting the strands of the yarn will form upon the same knotted, clouded, or thickened portions, which gives the yarn a rough and uneven appearance. These yarns are at present popular in certain kinds of cloth used in making clothing for men and women, which thereby is given a roughened or ribbed appearance.

Briefly, my invention comprises the embodiment in the machine above mentioned of certain parts and devices which will cause the yarn to be twisted continuously, but owing to the angle of approach of the different strands of the yarn to each other and a variation in the speed of advance of the strands at different intervals will cause one strand to be wound upon the other with a varying number for a unit of turns of length, so that the greatest number of turns of one of the strands will cause the yarn to have a thickened appearance at certain points.

I am aware that machines have heretofore been produced for causing a clouded or knotted appearance in yarns by winding one strand upon the other with varying number of turns at different points or intervals; but the means employed for accomplishing this result have been complicated and involve machines which required a great amount of power, were noisy, and inefficient. My invention, on the other hand, accomplishes the same and even better results without the use of reciprocating parts and without the use of complicated arrangements of machine elements.

For a full, clear, and detailed description of my invention reference may be had to the following specification and to the accompanying drawings, forming a part thereof, in which—

Figure 1 is a transverse sectional view of a twisting-frame embodying my improvement, the essential parts only being shown; Fig. 2, a front elevation thereof; Fig. 3, a sectional view of my improvement shown independently of the complete machine; Fig. 4, a front elevation of the same; Fig. 5, an elevation of one form of gearing for causing an intermittent or variable rotation of the feed-rolls, showing a portion of the casing and machine in section. Fig. 6 is a side elevation thereof; and Fig. 7, an elevation of two gears constituting a modified form of intermittent driving mechanism, which may be used instead of the gears shown in Fig. 6.

Referring to the drawings, the numeral 1 indicates a suitable frame upon which is adjustably supported an arm of bracket 2, which carries a longitudinal extending strip or plate 3 at its outer end having recesses or openings therein, as indicated at 4, for the purpose of allowing the passage of one strand 5 of the yarn. The openings 4 are preferably provided with transverse wire loops 6, which form smooth even edges over which the strand may pass without being worn or injured.

The lower part of the frame 1 is provided with a transverse bar 7, within which the spindles 8 are adapted to have vertical bearing in the usual manner. A similar parallel transverse bar 9 carries a series of rings 10, through which the upper ends of the spindles 8 project, said rings and bars being given a vertical reciprocating movement in the usual manner for winding the yarn lengthwise upon the spindle 8 and for twisting the same. The rings 10 are provided with wire loops or travelers 11. Above the spindles 8 and in substantial alinement therewith are supported wire eyes or guides 12, which are carried by suitable supports or brackets 12', attached to the frame 1. Above the arm 2 are carried pairs of feeding-rolls 13 and 14, which are driven so as to have variable speeds of rotation and through which the strands 15 and 5 of the yarn, respectively, pass. Either or both of these pairs of rods may be given an intermittent or variable speed of rotation by means of the gearing hereinafter to be described or in any well-known manner usual in this class of ma-



chines. Upon the end of the arm 2 I place an L-shaped support 16, to which is adjustably attached a slotted arm 17 by means of a screw or bolt 18. These supports occur at suitable intervals along the length of the machine, and slotted arms 17 carry at their outer end a longitudinal extending rod or guide 19, over which the strand 15 is adapted to pass. The upper pairs of feed-rolls 13 are preferably given a variable increasing and diminishing speed or may be even started and stopped at suitable intervals, thereby causing the forward motion of the strand 15 to be alternately accelerated and retarded in its forward motion. The operation of my improved device is as follows:

As means for giving an intermittent or variable speed of either of the pairs of feed-rolls 13 and 14 I may provide the following mechanism: To a suitable part of a machine frame or casing 21 is adjustably attached an arm 22, which is retained adjustably in position by means of a stud or bolt 22'. A similar arm 23 is also adjustably attached to the casing 21 by means of the bolt or stud 23'. These arms are provided in their outer ends, respectively, with slots 24 and 25, through which passes studs or bolts 26 and 27 to retain adjustably in position the bearings for the gears 28 and 29. Said gears 28 and 29 are adapted to mesh with each other and may be made of different relative sizes, depending on the speeds desired to be transmitted to the feed-rolls. Upon the same stud or bearing with the gear 29 and so connected as to revolve therewith is a partial or mutilated gear 30, which is adapted to intermittently mesh with gear 31, carried by one end of the shaft of the lower feed-roll 13, said shaft being supported in suitable bearings, as indicated at 32. The main driving-shaft of the machine is indicated at 33 and carries a main driving-gear which meshes with the gear 28, carried by the arm 22. By this arrangement the gears 34, 28, and 29 will be given a continuous rotation, thereby continuously rotating the mutilated gear 30. As this gear revolves the blank and toothed portion of said gear will alternately come opposite to the driven gear 31 and will therefore cause said driven gear to have an intermittent motion, according to the relation between the blank and toothed portions of said mutilated gear 30. The feed-rolls 13 will therefore be given an intermittent motion for the purpose herein-after more particularly described.

Instead of the mutilated gear 30 and gear 31 I may substitute eccentric gears 35 and 36, the former of which is rigidly connected with the gear 29 in a manner similar to that described in relation to the mutilated gear 30. This latter arrangement of gearing will produce a similar effect upon the feed-rolls 13, with the exception that the motion will be

gradually increasing and diminishing rather than sudden rotations and stops.

Referring particularly to Fig. 3, it will be seen that as the strands of the yarn are twisted by the rotary motion of the spindle 8 and traveler 11 (shown in Figs. 1 and 2) and by reason of the relatively varying speed of the strands of the yarn the strand 15 will vary in tension, becoming alternately tight and loose during its forward motion, and since the feed-roll 14 has a constant speed of rotation the strand 5 will be alternately pulled and released by the strand 15. The tightening of the strand 15 will cause the twisted portion 20 of the yarn, together with the untwisted portion of the strand 5, to be pulled into the position shown in dotted and dashed lines in Fig. 3, while a loosening of the strand 15 will again allow the yarn and strand to move toward the position shown in full lines in Fig. 3. It will thus be seen that the strands while being constantly twisted reciprocate from one position to another, according to the retardation of the feed-rolls 13 or 14, thereby varying the angle of approach of one strand to the other. It is obvious that when the yarn and the strands 15 and 5 are in the position shown in dotted and dashed lines the strands 5 will be wound in closer turns upon the strand 15. When the strands are in an intermediate position between these two extremes and have equal tension, the two strands will be substantially equally wound upon each other, thereby forming an even and symmetrical twist in the ordinary manner. It will thus be seen that owing to the angle of the approach and the relatively intermittent feed motion of the strands I accomplish the result of producing the clouded or knotted portions in the yarn by the simple and most efficient arrangement of parts possible, while at the same time by adjustment of the slotted arm 17 I may change the angles of the approach of the strands, and thereby produce different degrees in the sizes and arrangements of the enlarged or knotted portion of the yarn. It will also be obvious that a vertical reciprocating motion of the supporting-arm 2 is unnecessary, as has heretofore been employed in some forms of twisting and doubling machines, and by the simple attachment, including the adjustable slotted arm 17 and the guide-rod 19 carried thereby, I have produced the same result in a very simple and efficient manner.

It is evident that it is not necessary that the feed-rolls 13 be the particular ones which are given an intermittent or variable speed, for the similar results may be accomplished by causing the rolls 14 to act in the same manner. It is also evident that both pairs of feed-rolls may be given a varying or intermittent motion by being alternately either retarded or accelerated.

I do not wish to be limited to the exact de-



tails of form and arrangement of parts embodying the form of my invention herein shown, for the same may be varied to suit different requirements and conditions without departing from the spirit and scope of my invention; but

What I claim, and desire to protect by Letters Patent of the United States, is—

10 1. The combination with a device for twisting yarn, of means for causing the strands of the yarn to approach each other at varying angles.

15 2. The combination with a device for twisting yarn, of means for causing the strands of the yarn to approach each other at an angle, and means for intermittently varying the relative tension of said strands to cause one strand to be wound upon another with varying numbers of turns.

20 3. The combination with a device for twisting yarn, of guides for causing the strands of the yarn to approach each other at an angle, and means for causing said strands to approach each other with relatively variable speeds in their forward motions so that one strand will be wound upon another with varying numbers of turns.

30 4. The combination with a device for twisting yarn, a series of guides having triangular relation with each other so that the strands of the yarn are carried by the third guide, and means for varying the relative tensions of the strands so that one strand will be intermit-

tently wound upon another with varying numbers of turns.

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5. The combination with a device for twisting yarn, of a pair of feed-rolls for each strand of the yarn, said feed-rolls having relatively varying speeds, guides over which said strands are adapted to pass so as to approach each other at an angle and a guide through which the completed yarn is adapted to pass to the spindle or twisting device.

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6. The combination in a device for twisting yarns, of guides for causing the strands of said yarn to approach each other at an angle, one of said guides comprising a rod, slotted arms carrying said rod, a support to which said slotted arm is adjustably secured, and means for causing said strands to be fed with relatively varying speeds.

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7. As an article of manufacture, an attachment for devices for twisting yarns comprising suitable supports adapted to be attached to said devices, adjustable arms carried by said supports, and a rod carried by said adjustable arms, said attachment being adapted to cooperate with feed-rolls having relatively varying speeds of rotation.

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In witness whereof I have hereunto set my hand this 22d day of August, A. D. 1904.

60

JACOB S. VERLENDEN.

Witnesses:

LEWIS H. VAN DUSEN,  
EDWARD W. VAILL, Jr.