

G. ADSIT.
 QUILLING MACHINE.
 APPLICATION FILED APR. 9, 1909.

1,005,405.

Patented Oct. 10, 1911.

4 SHEETS—SHEET 1.

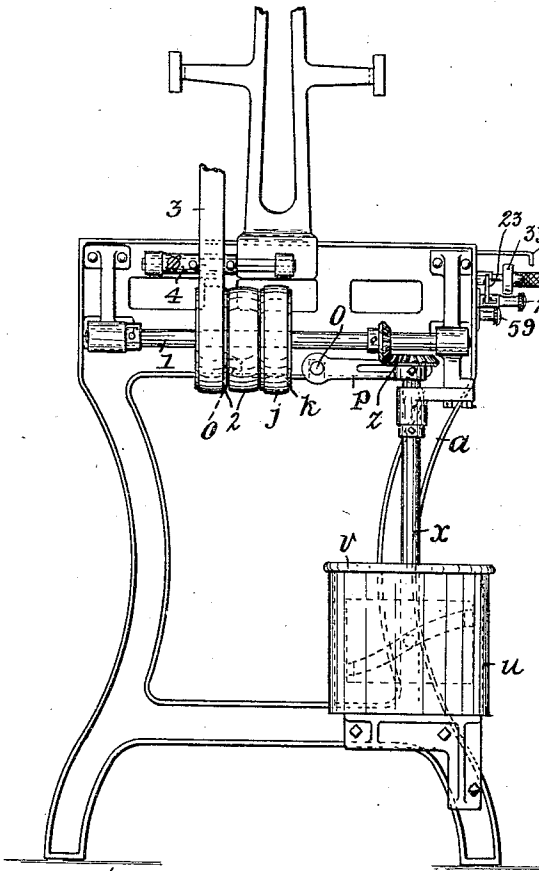


Fig. 1.

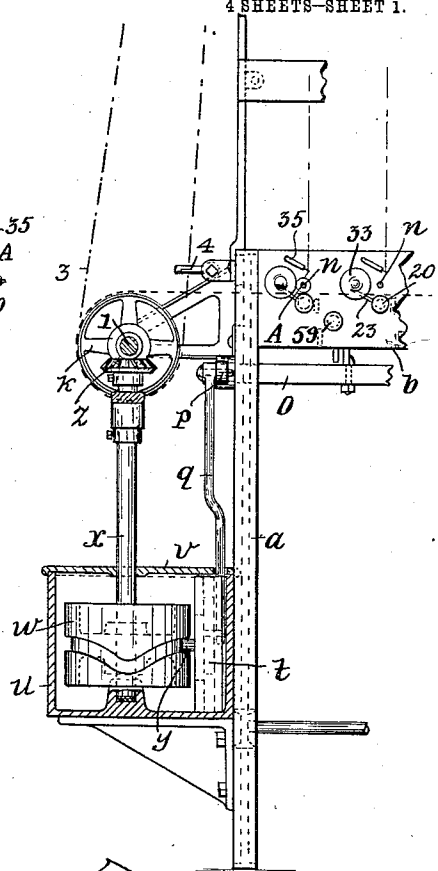


Fig. 2.

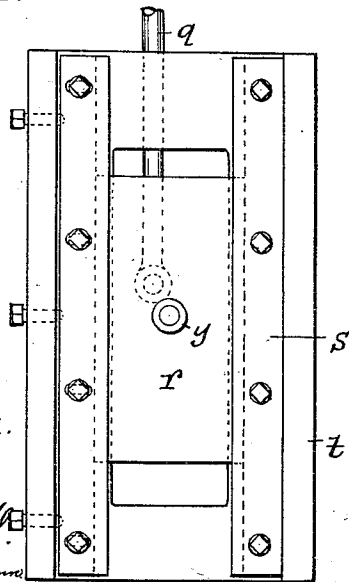


Fig. 3.

WITNESSES

Wm. Drell
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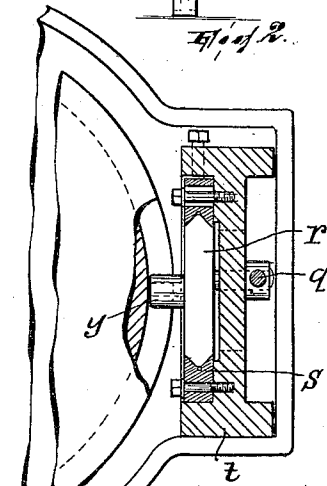


Fig. 4.

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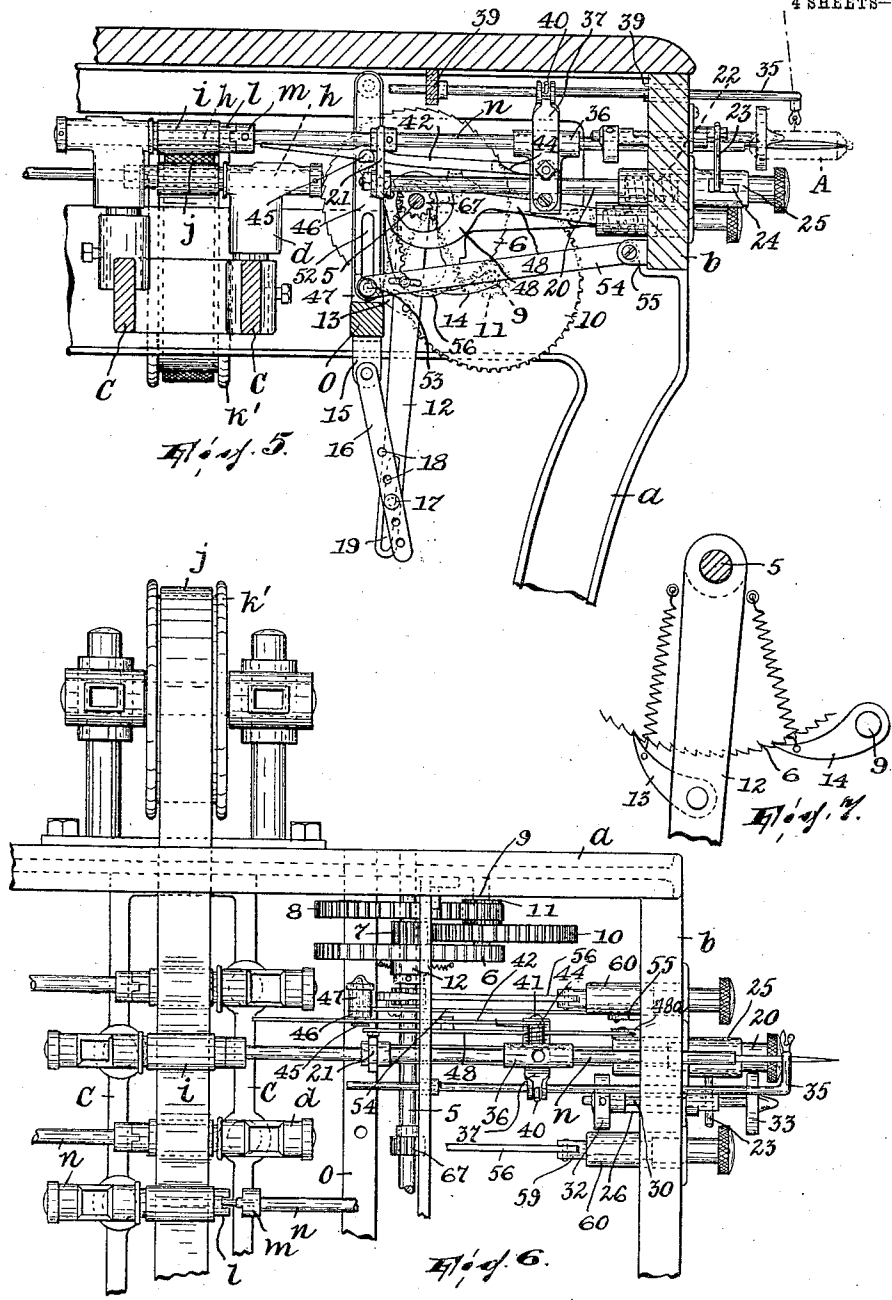
ATTORNEY.

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4 SHEETS—SHEET 2.



WITNESSES
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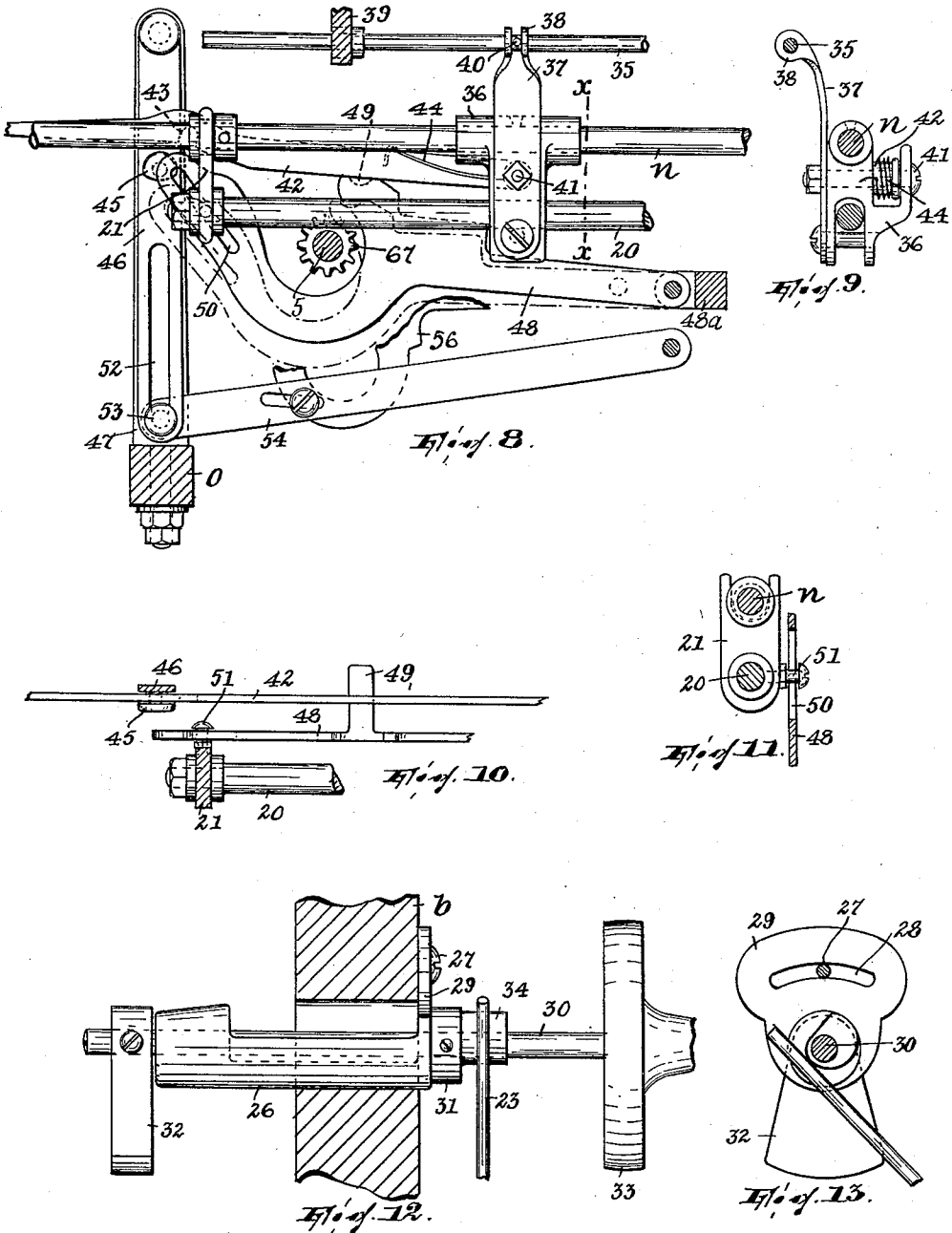
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4 SHEETS—SHEET 3.



WITNESSES

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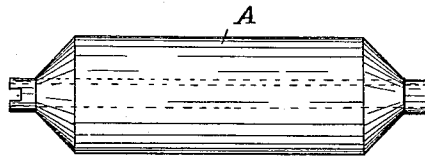
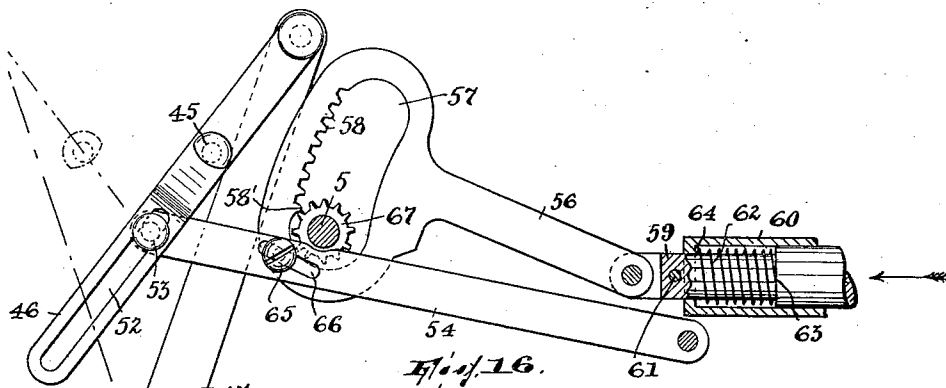
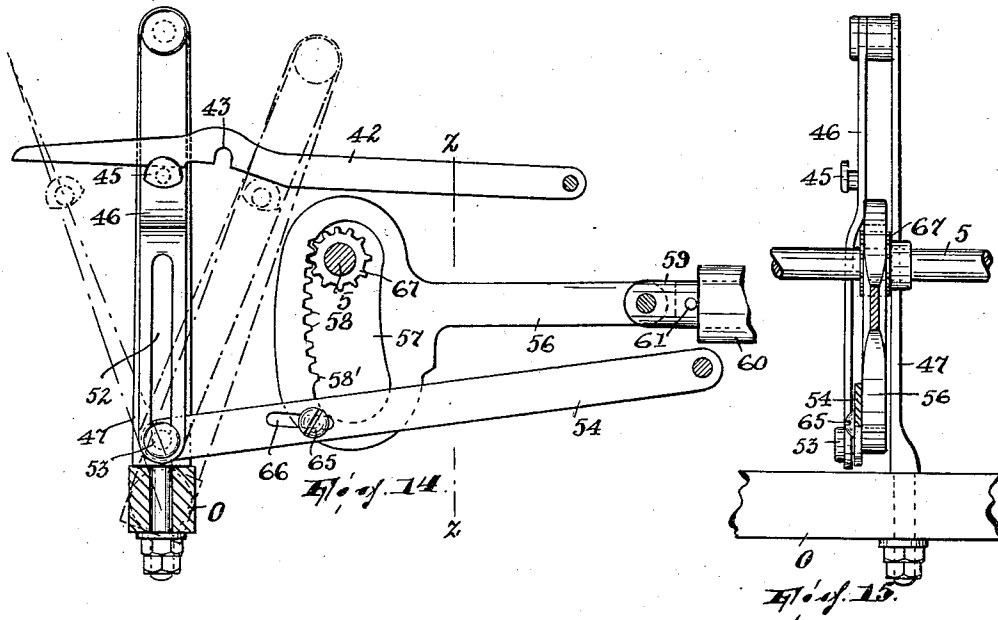
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1,005,405.

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4 SHEETS—SHEET 4.



WITNESSES

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Fig. 17.

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UNITED STATES PATENT OFFICE.

GEORGE ADSIT, OF PATERSON, NEW JERSEY, ASSIGNOR TO BENJAMIN EASTWOOD COMPANY, OF PATERSON, NEW JERSEY.

QUILLING-MACHINE.

1,005,405.

Specification of Letters Patent.

Patented Oct. 10, 1911.

Application filed April 9, 1909. Serial No. 488,911.

To all whom it may concern:

Be it known that I, GEORGE ADSIT, a citizen of the United States, residing in Paterson, Passaic county, New Jersey, have invented a certain new and useful Improvement in Quilling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My present invention relates to the winding of cops and the like, and particularly to that class of machines for accomplishing this work in which the cop is built up by successive winding of series of coils or layers each of which is approximately coextensive with the length of the cop.

The objects of my invention will be apparent upon reference to the essential features of the invention which are (1) the means whereby, as the winding of the cop proceeds, the longitudinal extent of the successive series of coils or layers is gradually diminished with the effect of forming the cop tapering or conical at each end, so that the end coils are less subject to endwise displacement in handling and a more stable and substantial cop is produced than a cop of the kind where the ends are approximately square or blunt; (2) the means whereby various adjustments may be effected, for instance so as to vary the diameters and degrees of taper of the ends of the cops; (3) the novel means for automatically stopping any winding unit upon a cop having been built up to a predetermined extent; and, (4) the novel mechanism whereby the rocking of a certain structure which effects the traverse motion mentioned is accomplished.

In the accompanying drawings, Figure 1 is a view of the machine in end elevation; Fig. 2 shows in side elevation, partly in section, the end portion of the machine appearing in Fig. 1; Figs. 3 and 4 are views illustrating the means whereby the rocking of the structure which effects the traverse-motion of the thread-guides is accomplished, Fig. 3 being a view partly in plan and partly in section, and Fig. 4 showing in end elevation certain details in Fig. 3; Fig. 5 a transverse vertical sectional view of the machine taken

between two of the winding units and looking toward the right in Fig. 2; Fig. 6 is a plan view of the end-portion of the machine opposite to that which appears in Fig. 2; Fig. 7 illustrates a detail involved in the mechanism for diminishing the traverse of the thread-guides; Fig. 8 is a view, showing in side elevation, partly in section, so much of one of the winding units as relates particularly to the means for effecting the traverse of its thread-guide and the manner in which such traverse is automatically stopped upon stopping the rotation of the spindle; Fig. 9 is a vertical sectional view on the line $x-x$ of Fig. 8; Fig. 10 is a plan view of certain details shown in Fig. 8, and illustrating the parts directly involved in stopping the traverse motion of the thread-guide; Fig. 11 is a vertical sectional view through parts n , 20 and 48 in approximately the plane of one face of a certain coupling device 21 in Fig. 8; Fig. 12 is a view in side elevation of a part of the means whereby the automatic stopping of a winding unit is accomplished when the building up of the cop is complete; Fig. 13 is a front view, partly in section, of what is shown in Fig. 12; Fig. 14 is a view showing in side elevation, partly in section, so much of one of the winding units as relates particularly to the means for effecting the traverse of its thread-guide and the manner in which the extent of the traverse is gradually diminished; Fig. 15 is a vertical sectional view on the line $z-z$ of Fig. 14; Fig. 16 is a view substantially like Fig. 14, the position of the parts being changed; and, Fig. 17 illustrates the completed cop.

The uprights a of the machine frame are connected in the usual manner by the side rails b , b and intermediate rails c , c , in the latter of which are arranged the bolsters d forming bearings for shafts h carrying whirls i which engage the upper stretch of an endless belt j , extending around pulleys k and k' , from above and below; said shafts carry clutch-members l with which engage the clutch-members m on the spindles n journaled in said shafts and the rails b , b . The arrangement and operation of the foregoing parts are the same as in my United States Patent No. 757,081, and others, excepting that in the present instance the whirls are between the bolsters and spindles, instead of the bolsters being between the

spindles and whirls, thus saving space in the machine, and making it more compact. In the present instance there are two rock-shafts *o*, which control the traverse of each
 5 of the two sets of thread-guides for the two sets of winding units, one at each side of the machine. These rock-shafts may be connected in any suitable manner so as to rock synchronously; for the purpose in hand it is
 10 only necessary to show and describe in detail one of them and the manner whereby it is oscillated and controls the set of thread-guides corresponding thereto. Therefore, on one end of such rock-shaft is a slotted
 15 crank *p* to which is connected the upper end of a pitman *q* in turn connected with a slide *r* which moves in guides *s*, vertically, the guides being adjustably secured to an upright *t* fixed in a receptacle *u* (adapted to be filled with oil and having a cover *v*) in
 20 which is a peripherally grooved drum *w* arranged on a vertical shaft *x* stepped in the drum; a roller *y* on the slide plays in the groove of the drum which, being sinuous, causes the slide to reciprocate as the drum
 25 revolves. Shaft *x* is connected by bevel pinions *z* with a shaft 1 journaled in one of the end uprights *a* and carrying the pulley *h*. This arrangement permits the machine to be
 30 geared up to run at a high rate of speed without undue friction and vibration. The shaft 1 also carries the fast and loose pulleys 2 around which may be alternately extended the driving belt 3 controlled by the
 35 belt shifter 4.

Corresponding to each rock-shaft *o* and parallel therewith is a rotary shaft 5. On this shaft there is loosely journaled a ratchet-wheel 6 having a pinion 7 fast thereto,
 40 and fast on the shaft is a gear 8; on a counter-shaft 9 is freely journaled a gear 10 meshing with pinion 7 and having a pinion 11 fast thereto and meshing with gear 8; this arrangement of gearing is such that the rotary speed of the shaft 5 is considerably
 45 less than that of the ratchet-wheel. On the shaft is fulcrumed a lever 12 carrying a spring-controlled advancing pawl 13, engaged with the ratchet-wheel, and on shaft 9 is pivoted a spring-controlled pawl 14 holding said ratchet-wheel against backward rotation. A crank 15 on the rock-shaft is pivotally connected with lever 12 by the link 16, the pivot 17 between the link and lever being
 50 adapted for adjustment in either of them by the holes 18 in one and slot 19 in the other.

I will now describe the details of one of the winding units, an explanation of the construction and operation of one of them
 60 serving for all, as will be obvious. As in my previous patent referred to, the spindle *n* is movable longitudinally to effect the engagement and disengagement of the clutch-members *l* and *m*, its movement being effected by a push-rod 20 having a suitable

means 21 for coupling it with the spindle, the push-rod being normally forced outwardly in the rail *b* by a spiral spring 22 and having a laterally projecting pin 23
 70 which works in a notched slot 24 in a sleeve 25 guiding the push-rod. A bearing 26, adjustable in rail *b* by virtue of a screw 27 penetrating a curved slot 28 in a plate 29 forming part of the bearing, is arranged parallel with the push-rod and in this bearing
 75 is journaled a shaft 30 held against endwise movement by a collar 31 and a weight 32 and carrying a friction wheel 33. This friction wheel is laterally contiguous to the cop *A* being wound on the spindle *n*, and
 80 when the cop reaches a predetermined diameter it frictionally engages the periphery of the friction wheel 33 and, by turning it and shaft 30, causes a cam 34 on the shaft to disengage the pin 23 from the notch of slot 24, so that the push-rod disestablishes the clutch between the spindle and its driving shaft *h*.

The traverse of the thread-guide, 35, is effected as follows: A slide 36 is arranged to reciprocate on the spindle and push-rod (see Fig. 9); this slide carries an arm 37 whose forked upper end 38 is penetrated by the thread-guide 35 (which latter is in the form of a rod, rectilinearly movable in bearings 39), the thread-guide having a pin 40
 95 between the parts of the forked portion of the arm. On a bolt 41 in the slide is pivoted a hook 42 (Figs. 5, 8 and 14) whose under edge is substantially straight from end to end except where it is formed with the recess 43. A spring 44 coiled about the bolt 41 and bearing against the top of the hook and a part of the slide normally presses the hook
 100 downwardly. The hook rests upon a headed stud 45 on a lever 46 depending from one of a series of uprights 47 on the rock-shaft *o*. As will be explained later, the lever 46 partakes of the rocking motion of the structure comprising parts *o* and 47, and when the hook receives the headed stud in its recess it will convert the rocking motion of said structure into a reciprocating motion as to the thread-guide. When the winding of a cop has been completed and the rotation of the spindle stops automatically in the manner above described, it is expedient to stop the reciprocation of the thread-guide. Hence, in a suitable bracket 48^a is pivoted one end of a lever 48 having an arm 49 projecting
 110 under the hook and also having an oblique slot 50 receiving a pin 51 on the side of the coupling 21. When the push rod is released and moves outwardly, the action of pin 51 in slot 50 is to raise lever 48, which in turn raises the hook out of engagement with the vibrating lever 46, so that traverse of the thread-guide ceases. When the push-rod is pressed in again to start the spindle, lever 48 falls, allowing the hook again to rest on
 115 120 125 130

the stud 45 and ultimately receive the same in its recess 43 during the swing of the lever 46 then occurring.

The mechanism whereby the cops are made to have tapering ends has for its function to diminish gradually the throw of the lever 46 with the upright 47. The lever 46 has a longitudinal slot 52 which receives a headed stud 53 on a link 54 fulcrumed in a bracket 55 attached to rail *b*. Now on reference to Figs. 14 and 16 it will be observed that the link limits the movement of the lever 46 with the upright 47 and if the link 54 is gradually raised from the position in Fig. 14 to that in Fig. 16 the throw of a point, such as the stud 45, will gradually diminish. To accomplish the rise of the link I provide a lever 56 having an arc-shaped slot 57 one side of which is formed with segmental teeth 58, the lever being fulcrumed in a push-rod 59 which slides in a sleeve 60 in the rail *b* and which is held with a pin 61 normally in contact with the inner end of said sleeve by a spiral spring 62 coiled within the sleeve between a shoulder 63 on the push-rod and a shoulder 64 in the sleeve. A screw or the like 65 on lever 56 works in the slot 66 on the link 54. The loop of the lever 56 is penetrated by the shaft 5, which carries a pinion 67 engageable with the teeth 58.

In starting the winding of a cop, the operator presses the push-rod 59 inwardly. Teeth 58 of lever 56 are thus made to clear the pinion 67, so that the lever and link 54 fall. When the push-rod is released, the pinion engages the teeth 58 and gradually causes lever 56 to rise; meanwhile, the rock-shaft *o* being oscillated, lever 46 oscillates with it, the extent of throw of the lever gradually reducing as the stud 53 rises in the slot. The machine is of course set so that the mechanism for tapering the ends of the cops continues performing its function approximately until the winding of the cop is completed and is automatically stopped by the cop engaging the friction-wheel 33. Should, however, the pinion 67 have traversed all of the teeth 58 of lever 56 before that time, the pinion will simply wipe idly against the lowest tooth 58', holding the lever elevated until the operator presses the push-rod 59 inwardly.

The diameter of the cops to be wound of course depends upon the adjustment of the bearing 26, whereby the friction wheel 33 is brought nearer to or farther from the cop; in order to adjust the machine so as to change the taper of the cops, the connection between parts 12 and 16 may be changed, which will have the effect of causing the shaft 5 to rotate at a slower or faster speed and the link 54 to rise at a changed rate while the vibrating speed of the thread-guide remains the same.

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

1. In a quilling machine or the like, the combination, with a suitable support, of a part to be reciprocated, an oscillating member, a pivoted member pivoted in the oscillating member and connected to said part to be reciprocated, and means, comprising a part engaging an eccentric portion of the pivoted member, for limiting the extent of movement thereof with the oscillating member, substantially as described.

2. In a quilling machine or the like, the combination, with a suitable support, of a part to be reciprocated, an oscillating member, a pivoted member pivoted in the oscillating member and connected to said part to be reciprocated, and means, comprising a part engaging an eccentric portion of the pivoted member and movable relatively toward and from its pivot, for limiting the extent of movement thereof with the oscillating member, substantially as described.

3. In a quilling machine or the like, the combination, with a suitable support, of a part to be reciprocated, an oscillating member, a pivoted member pivoted in the oscillating member and connected to said part to be reciprocated, means, comprising a movable part engaging an eccentric portion of the pivoted member and movable relatively toward and from the pivot of said pivoted member, for limiting the extent of movement of said pivoted member with the oscillating member, and means for effecting the movement of said movable part, substantially as described.

4. In a quilling machine or the like, the combination, with a suitable support, of a part to be reciprocated, an actuating member, a pivoted member pivotally connected with the actuating member and also connected to said part to be reciprocated, and means, comprising a part engaging a portion of the pivoted member which is eccentric relatively to the point of pivotal connection between said members, for limiting the extent of movement of the pivoted member with the actuating member, substantially as described.

5. In a quilling machine or the like, the combination, with a suitable support, of a part to be reciprocated, an actuating member, a pivoted member pivotally connected with the actuating member, and also connected to said part to be reciprocated, and means, comprising a movable part engaging a portion of the pivoted member which is eccentric relatively to the point of pivotal connection between said members and movable toward and from said point, for limiting the extent of movement of the pivoted member with the actuating member, substantially as described.

6. In a quilling machine or the like, the combination, with a suitable support, of a part to be reciprocated, an actuating member, a pivoted member pivotally connected
 5 with the actuating member and also connected with said part to be reciprocated, means, comprising a movable part engaging a portion of the pivoted member which is eccentric thereof relatively to the point of
 10 pivotal connection between said members and movable toward and from said point, for limiting the extent of movement of the pivoted member with the actuating member, and means, comprising intermeshing toothed
 15 parts, for moving said movable part relatively toward and from said point, substantially as described.

7. In a quilling machine or the like, the combination of a suitable support, an actuating member, a pivoted member pivotally connected with the actuating member and adapted to be actuated thereby and having a slot extending substantially toward its pivot, a pivoted link engaged in said slot, and
 20 means for moving the link on its pivot, substantially as described.

8. The combination, with a suitable support, of a rotary spindle and means for controlling the rotation of the spindle comprising
 30 a normally movable part, a member normally restraining said part against movement, and a rotary part having an ec-

centric portion engageable with said normally movable part to release it from said member, said rotary part being peripherally
 35 engageable by the cop being wound, substantially as described.

9. In combination, with a suitable support, a rotary spindle, and means for controlling the rotation of the spindle comprising
 40 a normally movable part, a member normally restraining said part against movement, and a rotary gravity-actuated part having an eccentric portion engageable with said normally movable part to release it
 45 from said member, said rotary part being peripherally engageable by the cop being wound, substantially as described.

10. The combination, with a support, of a reciprocating thread-guide, a rotary spindle
 50 movable longitudinally, means for rotating the spindle, means for effecting the longitudinal movement of the spindle comprising a part extending parallel with the spindle, and means for reciprocating the thread-
 55 guide comprising a slide movable on said spindle and part, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of April, 1909.

GEORGE ADSIT.

Witnesses:

JOHN W. STEWARD,
 WM. D. BELL.