No. 746,439. PATENTED DEC. 8, 1903.

R. ATHERTON.

QUILLING MACHINE.

APPLICATION FILED APR. 3, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

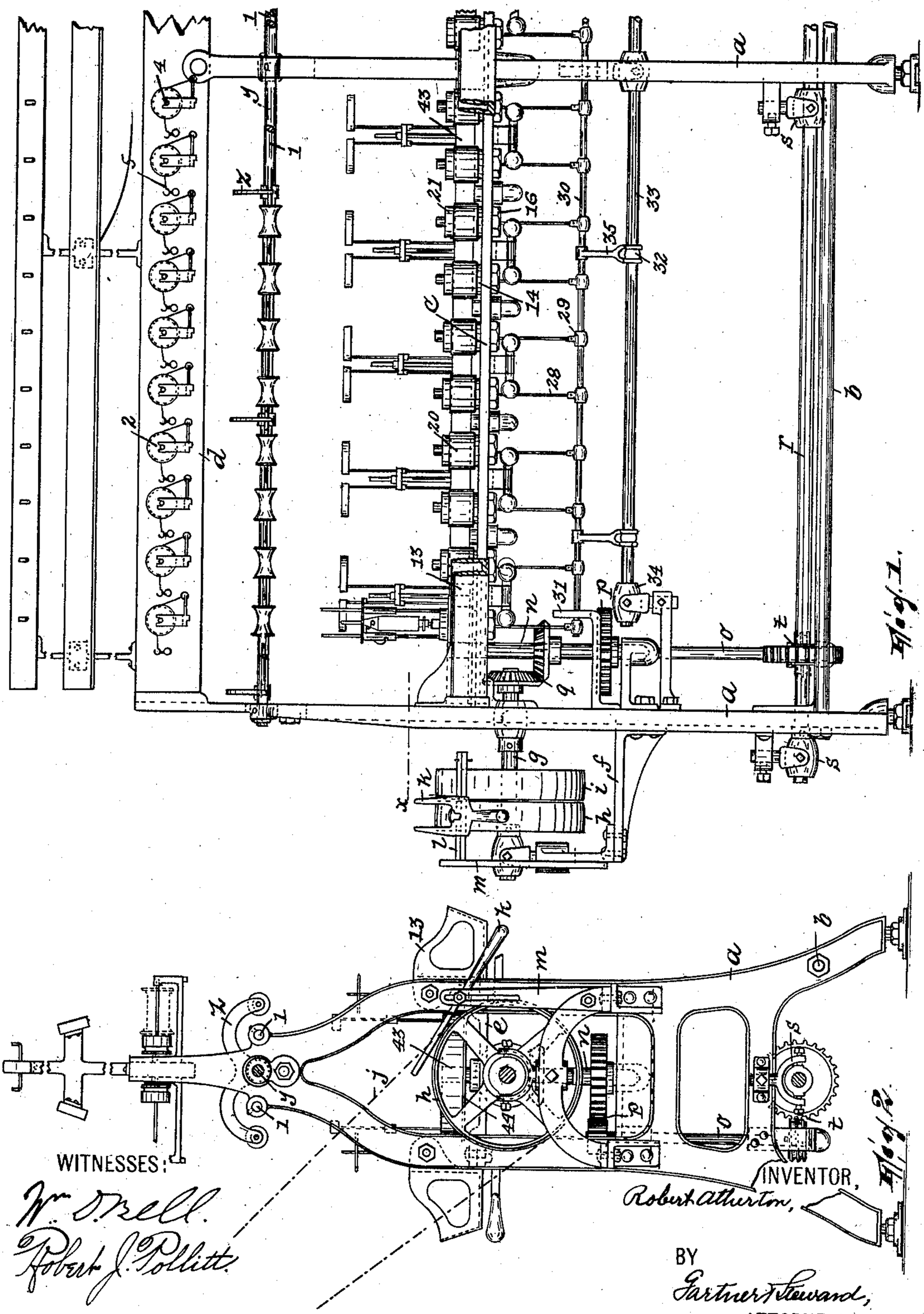

Fig. 1.

Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 2.

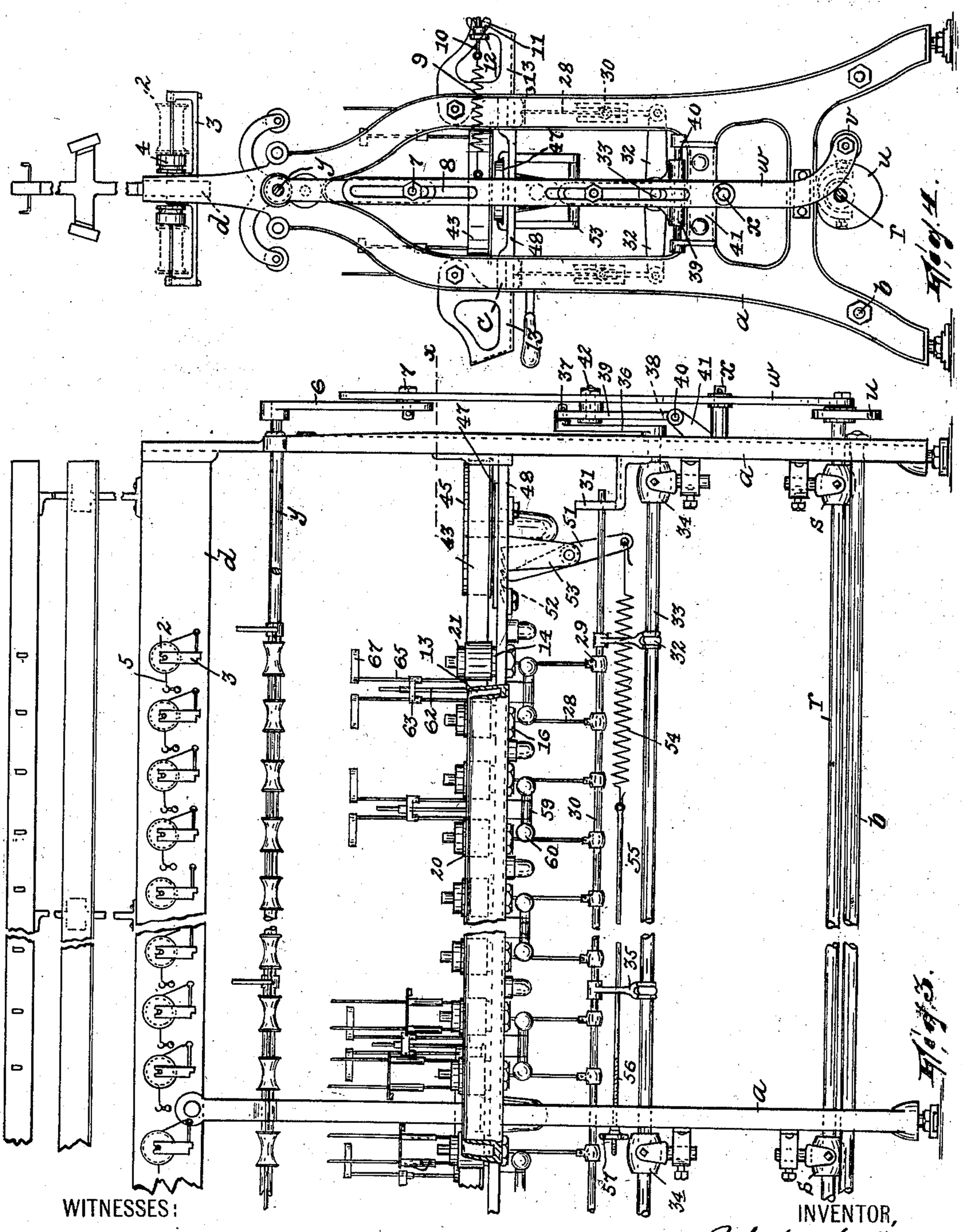

Fig. 3.

WITNESSES:

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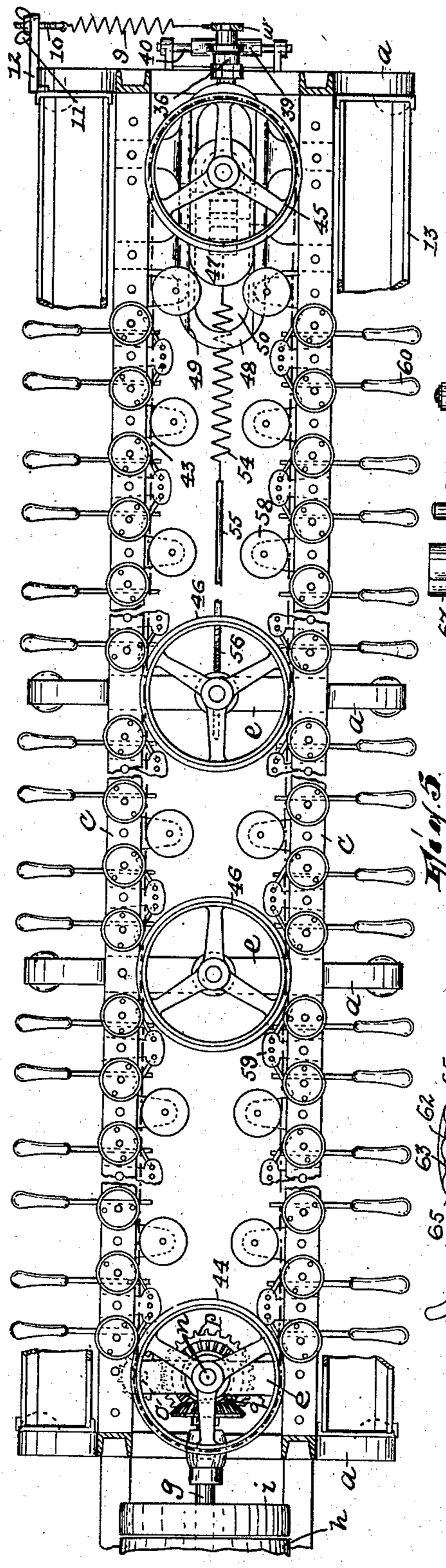
NO MODEL. 3 SHEETS—SHEET 3.



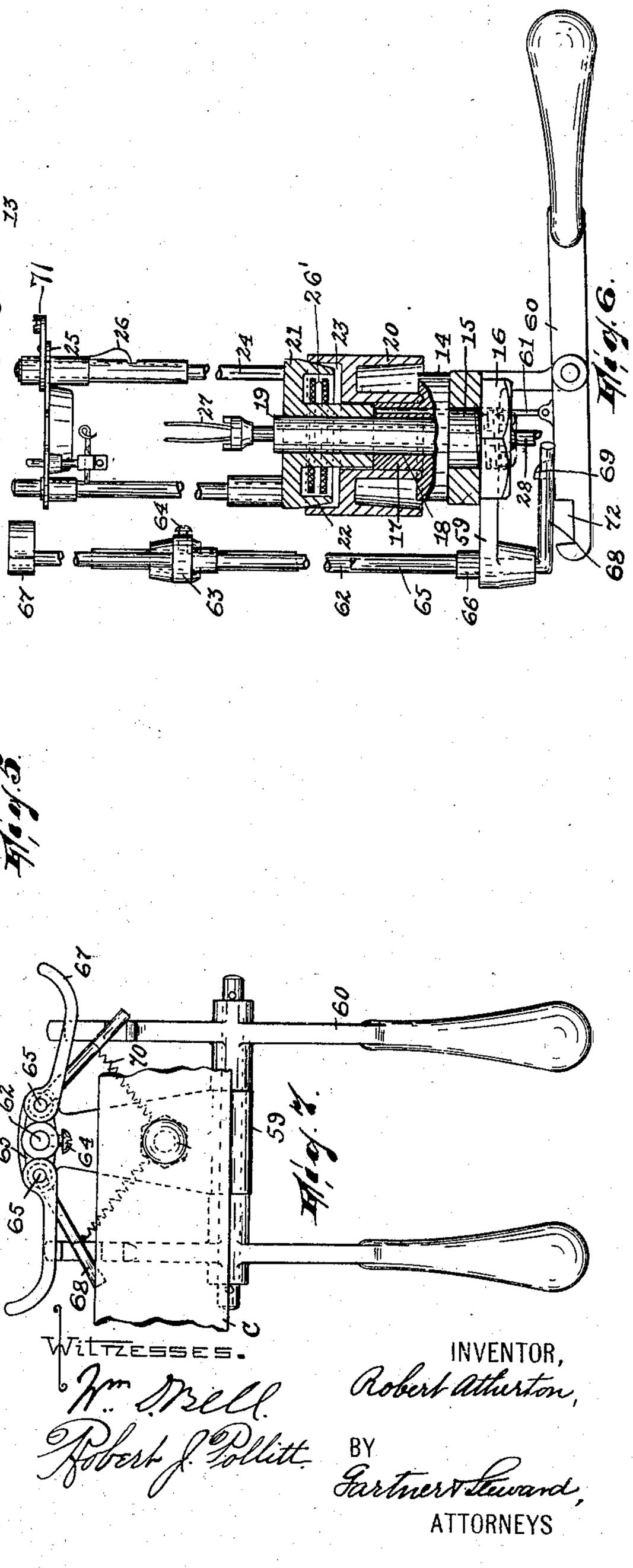


Fig. 6.

Fig. 7.

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No. 746,439. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

ROBERT ATHERTON, OF PATERSON, NEW JERSEY, ASSIGNOR TO ATHERTON MACHINE COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

QUILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 746,439, dated December 8, 1903.

Application filed April 3, 1903. Serial No. 150,883. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ATHERTON, a citizen of the United States, residing in Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements 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.

This invention relates to weft-thread spooling or quilling machines; and it has for its object to increase the efficiency of machinery of this nature by so constructing and arranging its various elements and groups of elements as to turn out an improved quality as well as an augmented quantity of product without sacrificing to this, but rather increasing durability, uniformity, and smoothness in action, facility in adjusting the parts where necessary, and such other valuable and more or less essential qualities.

The invention will be found fully illustrated in the accompanying drawings, wherein—

Figure 1 is a front view of that end portion of the machine where the power is taken in. Fig. 2 is an end view of what is shown in Fig. 1. Fig. 3 is a front view of the other end portion of the machine. Fig. 4 is an end view of what is seen in Fig. 3. Fig. 5 is a horizontal sectional view taken on the line $x\,x$ in Figs. 1 and 3. Fig. 6 is a view, partly in elevation and partly in vertical section, of one of the quilling or spooling mechanisms proper and its throw-out mechanism; and Fig. 7 is a top plan view illustrating the throw-out mechanism.

a designates a series of vertical standards secured together by braces *b* and rails *c* and *d*. Rails *c* carry the various spooling or quilling mechanisms proper and their accessory parts, as will be hereinafter particularly set forth, and they are two in number, being connected at suitable intervals by bridge-pieces *e*.

In a stand *f*, projecting from one of the end standards *a* and also in said standard, are disposed the main drive-shaft *g*, carrying fast and loose pulleys *h* and *i*, whereby power is taken into the machine from a belt *j*, and a belt-shifting device *k*, adjustably arranged on an arm *l*, forming a vertically-adjustable part of a bracket *m*.

n and *o* denote two parallel vertical shafts connected together by gearing *p*, whereby power is transmitted from the former to the latter, and the upper one of which is connected with shaft *g* by bevel-gearing *q*, while the lower one is made to drive a horizontal shaft *r*, journaled in bearings *s* on the several standards through the medium of a worm and worm-wheel connection *t*. On the farther end of shaft *r* is fixed a cam *u*, against the periphery of which wipes a roller *v*, carried by a lever *w*, fulcrumed at *x* in the adjacent end standard.

y designates a rock-shaft, which is journaled in the standards *a* and forms the axis of a rocking frame *z*, which coacts with stationary rods 1, disposed on both sides of shaft *y*, to draw off the thread from the supply spools or bobbins 2, arranged above. Each spool is carried by a bracket 3, projecting from rail *d*, being fast on a rotary spindle 4, having a suitable tension device 5. The spools are, it will be noticed, arranged transversely in the machine, thus making possible the placing of a greater number of them in one line than would be possible if they were arranged longitudinally. Frame *z* is rocked from lever *w* by a crank 6, carrying a pin 7, which works in a longitudinal slot 8 in the lever.

The roller *v* on lever *w* is held against the cam by a spiral spring 9, which connects the lever with a threaded pin 10, carrying a wing-nut 11, which takes against a stationary part of the machine, such as a projection 12 on one of the spool-boxes 13.

On each rail *c* are disposed at suitable intervals bushings 14, each bushing being formed with a stud 15, which projects down through the rail and carries a securing-nut 16. Each bushing, furthermore, is provided with a reduced upwardly-extending portion 17 and is penetrated vertically by a bore 18, into which fits a sleeve 19, made to fit fast in the bush-

ing 14, so as to be non-rotative. On the reduced portion of bushing 14 is journaled a pulley 20. Sleeve 19 serves as a bearing for a disk 21, having a conical periphery 22 fitting into and adapted to frictionally engage pulley 20 in a cavity 23 in the top thereof. Disk 21 carries a pair of vertical guide-rods 24, on which is arranged the thread-guide carrier 25, having a spring-pawl 26, which engages a vertical series of ratchet-teeth (not shown) on one of the rods 24, so that as the thread-guide carrier is intermittently elevated by the vertically-reciprocating cop being wound said thread-guide carrier will be automatically adjusted, and thus bring about the attenuation or building up of the cop all in the well-known manner.

26′ represents saturable lubricant-disks inclosed in cavity 23.

The spool or bobbin on which the cop is wound is carried by spring-prongs 27 on the upper end of the (non-rotative) spindle 28, each spindle being stepped in a socket 29. The several sockets are secured on a shaft 30, which is guided at its ends in forked brackets 31 on the end standards *a* and which is adapted to be reciprocated vertically from arms 32, projecting laterally from a rock-shaft 33, journaled in bearings 34 on the standards *a* through the medium of vertically-extending links 35. Rock-shaft 33 carries a crank 36, having a pin 37, which works in a vertical slot 38 of an arm 39, arranged to slide at its lower end horizontally on a rod 40, carried by a bracket 41, fixed to the end standard. Lever *w* carries a stud 42, which projects into the slot 38 of arm 39. Thus from lever *w* the spindles, and consequently the cops which they carry, are vertically reciprocated.

Each thread-guide carrier 25 is rotated about the corresponding spindle, so as to coact therewith in winding the cops, by a continuous belt 43, which extends around drive-pulleys 44 and 45 and idlers 46. Drive-pulley 44 and idlers 46 are journaled in the bridge-pieces *e*. Drive-pulley 45 is journaled in a stand 47, arranged to slide in a bracket 48, said bracket having a longitudinal dove-tailed groove 49, and the stand being formed to fit the groove. Bracket 48 is formed with an opening 50, through which projects the point of a pawl 51, which engages any one of a series of teeth 52 on the under side of the stand, said pawl being pivoted in arms 53, projecting downwardly from the bracket and having its lowermost end pulled upon by a spring 54, which is connected with a rod 55, having a threaded portion 56, which penetrates one of the intermediate standards and is engaged by a nut 57, taking against the standard. Spring 54, which tends to cause pawl 51 to move the pulley 45 away from pulley 44, thus keeps the belt taut, and the tension can be regulated both by changing pawl 51 from engaging one of teeth 52 to engaging another or by manipulating nut 57.

The power for rotating pulley 44, and consequently belt 43, is taken from the shaft *n*, on which said pulley is fast. Belt 43 is kept against the pulleys 20, whereby the various thread-guide carriers are rotated by idlers 58, arranged one opposite the space between each pair of pulleys 20.

Since each thread-guide carrier is adapted to be driven from the corresponding pulley 20 whenever disk 21 is in frictional contact with pulley 20, the rotary action of the thread-guide carrier may be stopped by elevating disk 21 out of contact with pulley 20. This feature is utilized to automatically stop the winding when the cop has been built up to the proper extent in the following manner: On a bracket 59, secured on each rail *c* at each space between the quilling or spooling mechanisms proper unoccupied by the idlers 58, is fulcrumed a pair of weighted levers 60, each carrying a pin 61, pivotally connected thereto at its lower end and projecting up through a corresponding bushing 14, its upper end being opposed to the lower end of the hub of disk 21. 62 is a post projecting upwardly from each bracket 59 and carrying a bearing-piece 63, which is adjustably fixed thereon by a set-screw 64. In the bearing-piece and the bracket and on each side of the post is journaled a vertical rock-shaft 65, kept from downward displacement by a collar 66, resting on the bracket, the upper end of the rod carrying a curved crank 67 and its lower end being bent off at right angles, as at 68, to form another crank. Each crank 68 extends over the corresponding lever 60 and is normally held against a stop 69 on the lever by a spiral spring 70, which connects it with bracket 59. In this position the crank 67 is held in the path of movement of a projection 71 on the thread-guide carrier when the latter is elevated high enough, and crank 68 holds lever 60 in the position where pin 61 permits engagement between disk 21 and pulley 23. In lever 60 is formed a recess 72. This recess is so disposed that when the rod 62 is turned by the projection 71 on the thread-guide carrier engaging the crank 67 it will stand opposed to the crank 68, thus permitting the lever 60 to move up far enough so that the pin 61 will break the contact between disk 21 and pulley 20, and thus cut off the power from the thread-guide carrier.

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

1. The combination of the spindle-rail, a bushing secured on said rail and provided with a reduced upwardly-extending portion, a driving part journaled on said reduced portion of the bushing and having its bearing portion extending higher than the same, a driven part having its bearing portion extending into the bearing portion of the driving part and alined with said reduced portion of the bushing, a bearing member constituting an axis for the driven part and penetrat-

ing said driven part and the bushing, said driven part being movable axially into and out of frictional contact with the driving part, and means for moving said driven part axially, substantially as described.

2. The combination of the spindle-rail, a bushing secured on said rail and provided with a reduced upwardly-extending portion, a driving part journaled on said reduced portion of the bushing, a driven part arranged in axial alinement with the driving part and movable to and from the same into frictional engagement therewith, means for moving the driven part out of engagement with the driving part, said driven part having a cavity opening toward the driving part, saturable lubricant-disks in said cavity and an axial bearing mounted in the bushing and penetrating the driven part, substantially as described.

3. In a weft-thread spooling or quilling machine, the combination of a frame, rotary devices comprising thread-guide carriers, spindles, horizontal shafts sustaining said spindles, vertical guideways for said shafts, a rocking structure comprising a rock-shaft and laterally-extending arms, and links connecting the ends of said arms and said first-named shafts, substantially as described.

4. In a weft-thread spooling or quilling machine, the combination of a frame, rotary devices comprising thread-guide carriers, spindles, a rocking structure sustaining and adapted to actuate said spindles, a lever, a sliding arm, a crank carried by the rocking structure, operative connecting means between the lever and the arm, and operative connecting means between the arm and the crank, substantially as described.

5. In a weft-thread spooling or quilling machine, the combination of a frame, rotary devices comprising thread-guide carriers, pulleys, one of said pulleys being movable to and from the other, means for adjusting said movable pulley comprising a carrying part and a pivoted part, one of which has teeth adapted to be engaged by the other, and elastic means engaging said pivoted part and forcing the portion thereof which engages the carrying part and said carrying part away from the other pulley, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 28th day of March, 1903.

ROBERT ATHERTON.

Witnesses:
DAVID S. OLDHAM,
JAMES B. NEWTON.