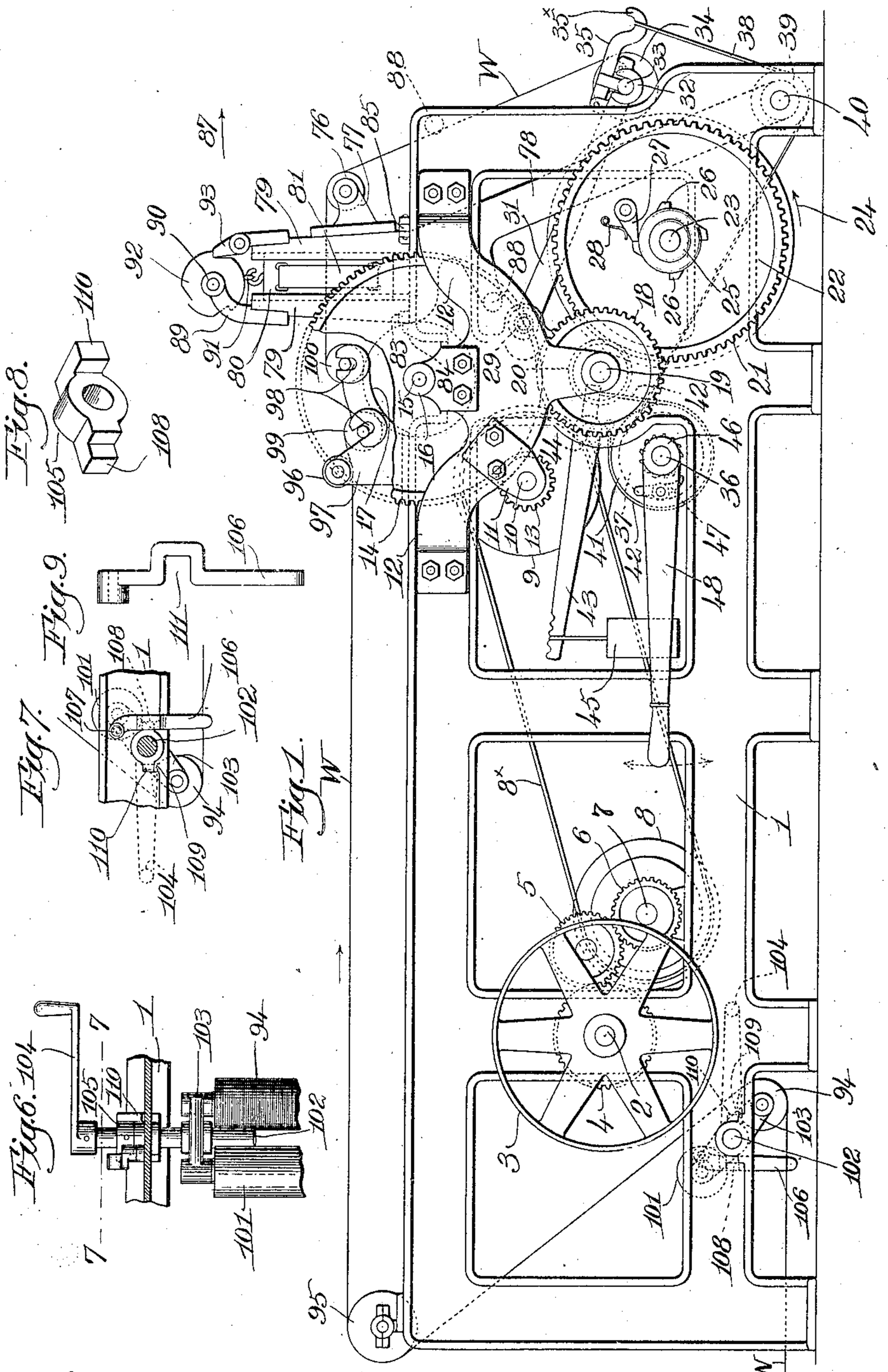
No. 877,863. PATENTED JAN. 28, 1908.

A. E. RHOADES.

SLASHER.

APPLICATION FILED AUG. 30, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

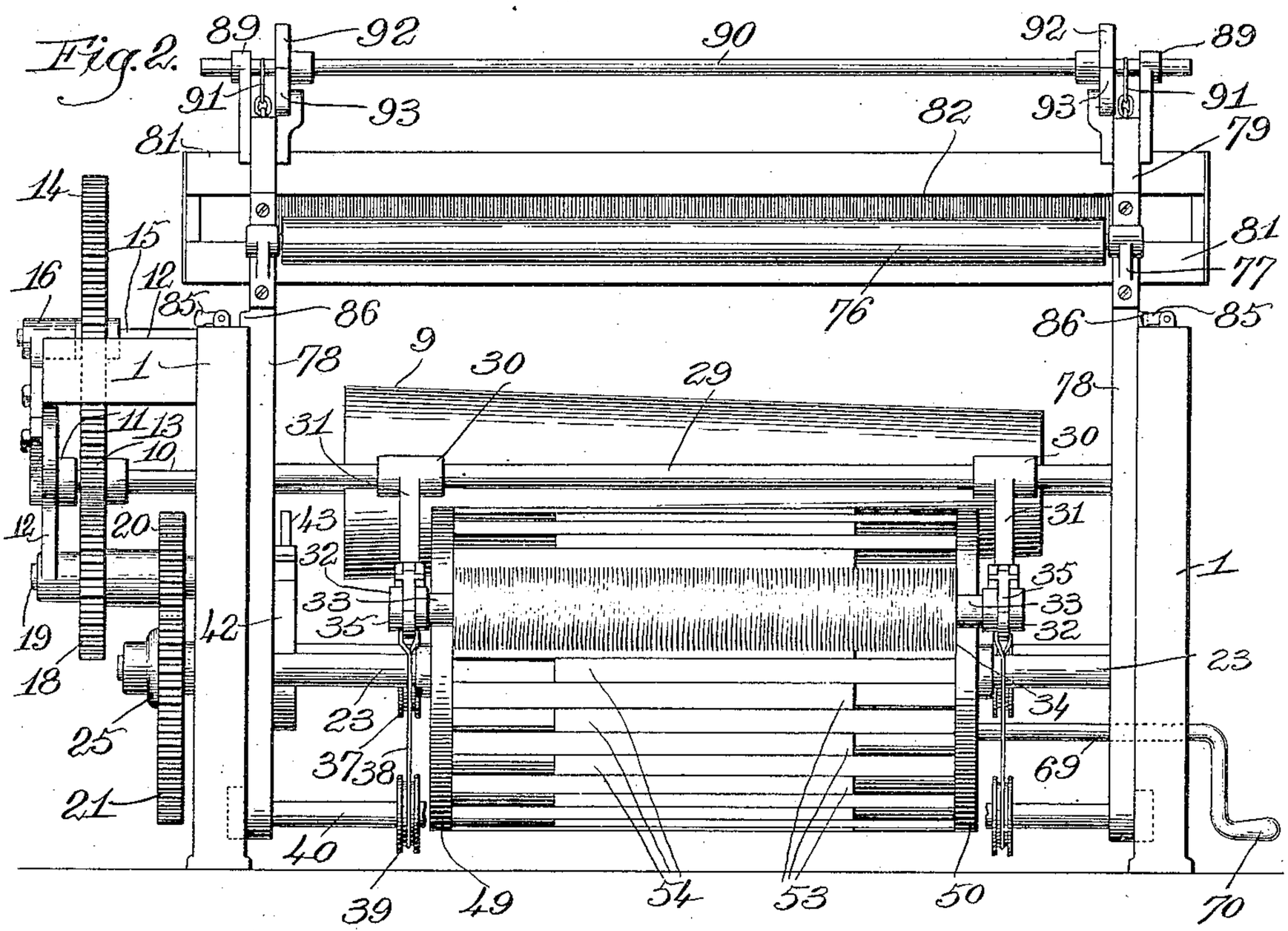


Fig. 3.

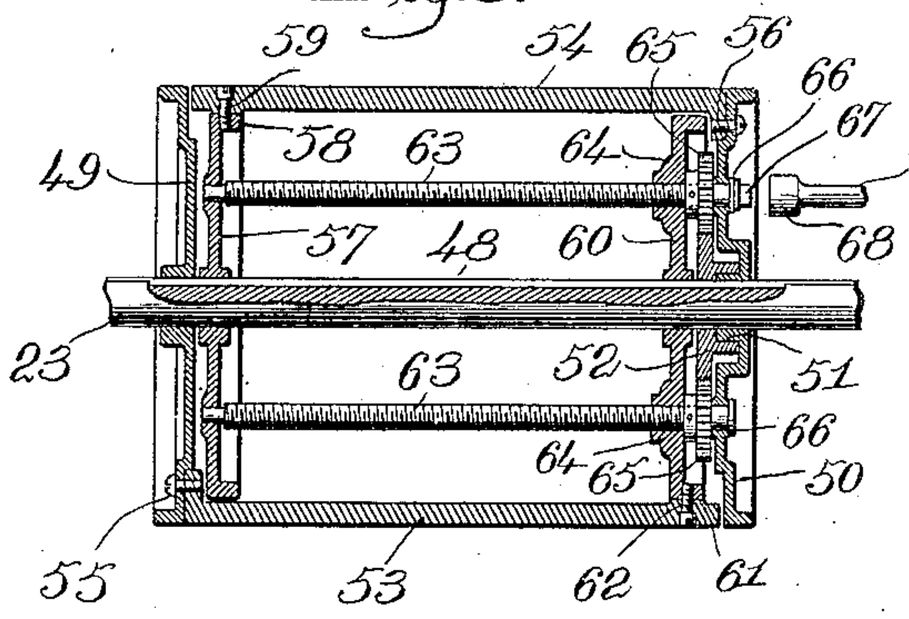


Fig. 4.

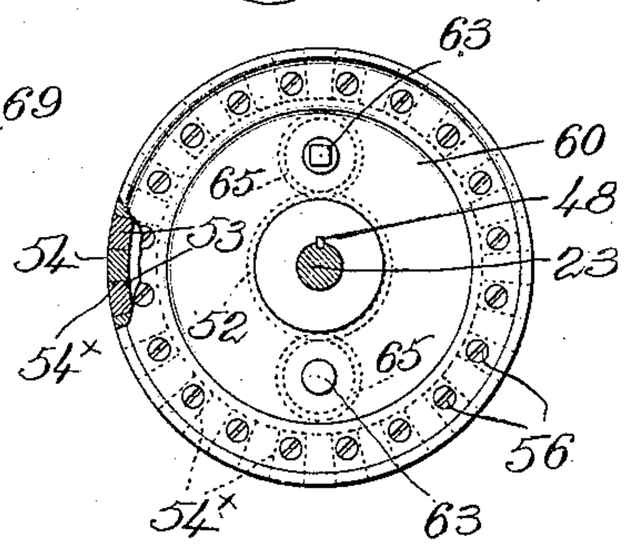
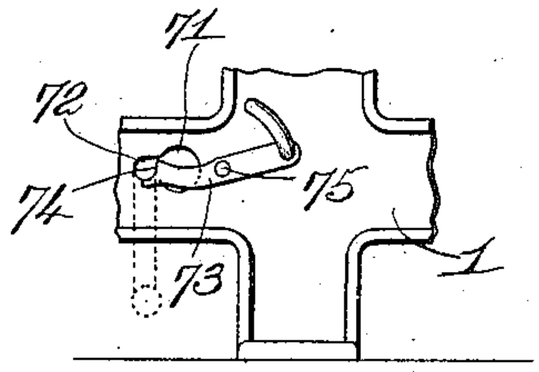


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SLASHER.

No. 877,863. Specification of Letters Patent. Patented Jan. 28, 1908.

Application filed August 30, 1906. Serial No. 332,568.

To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Slashers, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawings representing like parts.

This invention relates to slashers for warp-yarns, and it has for its object the production of various features of construction whereby the effectiveness of the apparatus is increased, its range of work widened, and its operation simplified. To this end I have provided a longitudinally-extensible actuating drum for the beam, whereby by a simple and rapid operation the drum is lengthened or shortened to conform to the length of the beam to be wound. I have also provided a comb-support so mounted that it may be swung into convenient position for effecting the introduction of the warp to the comb, and the latter is also shown as vertically adjustable with relation to the path of travel of the sheet of warp. Means are provided for controlling the pressure between the beam and the drum, with a let-off device governing such means as the diameter of the yarn mass increases on the beam. These and various other novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a side elevation of a sufficient portion of the beam-winding end of a slasher, with one embodiment of my invention applied thereto, the comb-support being shown in operative position; Fig. 2 is a right hand end elevation of the apparatus shown in Fig. 1; Fig. 3 is a longitudinal diametral section, on a smaller scale of the extensible actuating drum, the drum-shaft being in elevation; Fig. 4 is a right hand end view of the drum, showing in dotted lines a part of the means for varying the effective length of the drum, the broken out portion of the head showing in section some of the elements or bars which form the barrel; Fig. 5 is a detail, to be referred to, of the temporary bearing for the key or similar device by which longitudinal adjustment of the drum is effected; Fig. 6 is a top plan view of the scored and the smooth-surfaced guide-rolls and their support, (shown in side elevation Fig. 1), with the locking device to hold one or other of said rolls in operative position; Fig. 7 is a sectional detail on the line 7—7, Fig. 6, looking toward the side of the main frame; Fig. 8 is an enlarged perspective detail of the collar forming a part of the locking device; Fig. 9 is a detail of the latch which coöperates with the collar.

Referring to Figs. 1 and 2 the frame sides 1, of suitable shape and size to support the operating parts of the apparatus, sustain a shaft 2 having a driving pulley 3 thereon, Fig. 1, and a gear 4, rotation of the pulley being effected by suitable belting from the source of power, not shown. The gear 4 meshes with an intermediate gear 5 which in turn meshes with a gear 6 fast on the shaft 7 of a cone-pulley 8 connected by a belt 8× with a second and oppositely placed cone-pulley 9, the left hand end of its shaft 10 being supported outside the main frame in a bearing 11 on a bracket 12. The cone-pulleys and connecting belt form a part of the driving mechanism for the actuating drum, to be described, and constitute a speed-changing device of well known construction. A pinion 13 on the cone-pulley shaft 10 meshes with a large gear 14 fast on a shaft 15 extended across the frame at the top thereof and near its right hand end, Fig. 1, one end of said shaft being mounted in a bearing 16 on the bracket 12, and a tension cylinder 17 is fast on the shaft 15. The large gear 14 meshes with and drives an intermediate gear 18 on a short shaft 19 supported at its ends in bearings on the bracket 12 and the adjacent side 1 of the main frame, a pinion 20, (see Fig. 2, and dotted lines Fig. 1) fast on the short shaft 19 meshing with a large gear 21 secured to or forming part of a disk 22 rotatably mounted on the projecting end of the drum-shaft 23.

From the foregoing, and an inspection of the drawings, the train of gears and the speed-changing device interposed between the driving pulley 3 and the drum-shaft 23 will be obvious, a manually controlled connection being provided between the said shaft and the gear disk 22, to normally rotate the shaft 23 and the actuating drum in the direction of arrow 24, Fig. 1.

A hub 25 having a series of ratchet teeth 26, Fig. 1, is secured to the end of shaft 23,

and a pawl 27 on the gear disk 22 is adapted to coöperate with one of said teeth to thereby couple the drum-shaft and driving mechanism together. When it is desired to rotate the drum in a reverse direction the pawl is disengaged from the ratchet, and then the drum is free to be turned in either direction without hindrance from the driving mechanism, a suitable spring 28 acting to retain the pawl in operative position. A rod 29 held at its ends in the side frames 1 forms a fulcrum for the hubs 30, Fig. 2, of swinging arms or carriers 31 located between the side frames and extended forward, having at their free ends bearings 32 for the journals 33 of the beam 34 on which the warp, indicated at W, is wound, hinged locking latches 35 on the carriers serving to hold the beam journals in place. I have provided means to press the beam against the actuating drum (the latter rotating the beam by frictional engagement) with a let-off device to govern said means, as will now be described.

A transverse shaft 36 on the frame below the cone-pulley 9 has secured to it preferably two sheaves 37 around which are wound straps, bands or other flexible connections 38 led forward around guide sheaves 39 and up to the latches 35, a loop in the end of each connection being caught onto the hooked end 35× of the latch. The guide sheaves 39 are rotatable on a transverse rod 40 mounted in the side frames, see Fig. 1.

A brake or let-off sheave 41 fast on the shaft 36 is surrounded by a friction band 42, Fig. 1, fixedly held at one end and at its other end attached to the short arm of a lever 43 fulcrumed on the frame at 44, and on the long arm of said lever a weight 45 is hung, at the desired distance from the fulcrum 44, according to the power required for the let-off device. As the diameter of the yarn mass on the beam increases the carriers 31 will gradually be swung upward, pulling on the connections 38 and tending to rotate the shaft 36, the let-off resisting such tendency with the required power, so that the surface of the beam, or rather of the yarn mass thereon, is held pressed against the actuating drum, to be described. If the resistance is too great it can be reduced by moving the weight 45 inward toward the fulcrum of the lever, and vice versa. When a beam is full, and has been removed, of course the carriers 31 will drop down and the connections 38 become slack, and after a new beam is positioned said connections must be tightened up. To do this conveniently I attach a ratchet 46 to the shaft 36, Fig. 1, and provide a pawl 47 on a pawl-carrier 48 fulcrumed on the shaft, so that by a pumping action of the pawl-carrier, the pawl and ratchet being in coöperation, the shaft 36 will be rotated to wind the connections 38 on their sheaves 37. When the winding of the warp is in progress the pawl 47 will be thrown out of engagement with the ratchet.

The actuating drum now to be described is made longitudinally extensible in order that it may be adjusted to beams of different length, and the general structure of said drum is clearly shown in Figs. 2, 3 and 4. The drum-shaft 23 is provided with a longitudinal key 48, and coöperating with the key and mounted on the shaft are the two drum heads 49 and 50, herein shown as annular disks peripherally flanged to stiffen and strengthen them, the hub of the head 50 being annularly recessed internally to present a bearing 51 on which is rotatably mounted the hub of an intermediate gear 52, to be hereinafter referred to. The heads are rotatable with the shaft 23 by reason of the key 48, but they are movable longitudinally on the shaft with relation to each other to increase or decrease the distance between them, to thereby vary the effective length of the drum. The drum barrel or cylindrical portion between the heads is composed of two series of elongated elements or bars 53, 54, conveniently made of wood and having convexed outer faces, the sides of the bars lying in planes radial to the shaft, as shown at 54×, Fig. 4. The bars 53 are rigidly secured at one end to the drum-head 49 by suitable bolts 55, see Fig. 3, and extend at right angles from said head toward the opposite head 50, while the bars 34 are rigidly secured at one end to said head 50 by bolts 56, the bars 54 extending toward the head 49 and alternating with the bars 53. This is clearly shown in Fig. 2 and also in Fig. 4, and in Fig. 2 I have shown the drum as partly extended, while in Fig. 3 the drum is shown as contracted to present its minimum length.

The bars of one series preferably slide in contact with the radial sides of the bars of the other series, so that any bar of one series is laterally supported by two adjacent bars of the other series, and the faces of the bars are so convexed that they present a substantially unbroken cylindrical surface against which the beam is pressed, during the operation of the apparatus. The free ends of the bars of each series, meaning thereby the ends farthest away from the heads to which the bars are attached, are herein connected with and sustained by annular supports, one of which, see Fig. 3, is made as a disk 57 having an annular peripheral flange 58 to which the free ends of the bars 54 are secured by suitable screw-bolts 59. This support is connected to rotate with the drum-shaft 23 by the key 48. The other support 60 also connected by the key with the drumshaft has an annular flange 61 to which the free ends of the bars 53 are firmly connected by screws 62.

Manifestly from an inspection of Fig. 3, if

the distance between the heads 49 and 50 be increased, the distance between the supports 57 and 60 will be decreased and vice versa, and I have shown means for effecting such a change in the distance between the heads of the drum. Screw-threaded shafts 63 are rotatably mounted in suitable bearings in the support 57, and engage threaded bosses 64 on the support 60, each of the shafts having a pinion 65 fast thereon and meshing with the intermediate gear 52, hereinbefore referred to. The said shafts extend beyond the gears, and into the bearings in the head 50 of the drum, collars 66 on the said shafts preventing longitudinal movement in the said drum-head. One of the shafts has its projecting end squared as at 67, to be engaged by a suitable key or turning tool, the socketed head 68 and a portion of the shank 69 of the turning-key being shown in Fig. 3. By rotating one of the shafts, the gearing referred to communicates rotation to the other of the shafts in the same direction, and as the shafts are held from longitudinal movement, the supports 60 will be moved toward or away from the head 50. When the support 60 is moved away from said head, the head 49 moves in unison with it, and away from the annular support 57 so that the length of the drum is increased. A reverse rotation of the threaded shafts 63 diminishes the effective length of the drum.

The turning key has a long shank 69 and a crank handle 70, the length of the shank enabling the adjustment of the drum to be effected from the side of the machine, as shown in Fig. 2, but inasmuch as the key must be removed when the slasher is in operation I have provided a temporary bearing in one of the side frames, see Fig. 5. A keyhole slot is made in the side frame, the part 71 of the slot being large enough to permit the passage of the head 68 of the adjusting key, while the smaller part 72 of the slot is just large enough to take in the shank 69. When inserting the adjusting key after the head thereof has been passed through the part 71, the shank is moved laterally into the part 72 of the slot, and then a locking device 73 is swung into the position shown in Fig. 5, the notched end 74 of said device completing the bearing for the key-shank 69.

The locking device is fulcrumed on the side frame at 75, and when the adjustment of the drum has been effected, said device is swung out of position, releasing the key-shank so that the key can be moved laterally, and its head drawn out of the large part 71 of the slot. By absolutely removing the adjusting key, there is no chance of said key becoming caught in the rotating drum. The drum is rotated positively by the driving mechanism hereinbefore set forth, and by frictional contact with the warp on the beam rotates the latter and effects the winding, the pressure of the beam against the drum being regulated by means already described.

Referring to Fig. 2, it will be seen that the drum can be extended to an even greater effective length than therein shown, and of course when so extended, a portion of the barrel of the drum will not be continuous, viz: adjacent the heads, where the barrel members 53, 54 are slid outward, but this is unobjectionable and has no undue effect on the winding of the yarn. The sheet of warp W passes to the drum over a guide-roll 76 mounted in brackets 77 on the front of a swinging comb-support, comprising side arms 78 fulcrumed at their lower ends on the transverse rod 40, and connected at their upper ends, as will be described, the said support swinging between the sides 1 of the main frame. The arms 78 are provided with upright guideways 79 in which slide enlarged portions 80 of the comb-frame 81, the comb 82 supported thereby, see Fig. 2, being of any usual or suitable construction in connection with slashers. Lateral lugs 83 on the swinging comb support are adapted to abut against stops 84 on the sides 1, when the comb support is in its operative position, said support being locked therein by latches 85 fulcrumed on the frame-sides 1, and adapted to drop down in front of lugs 86 on the supports.

In Fig. 2 I have shown one of the latches in locking position, and the other latch at the left hand side thrown out to release the adjacent side of the support. When a new warp is to be drawn into the comb, the comb-support is unlocked and swung forward in the direction of the arrow 87, Fig. 1, until a stop 88 on the support engages a part of the flange on the end of the frame at the point shown in dotted lines Fig. 1, and at such time, the comb is brought forward, so that the operative can readily draw in the warp-threads without being inconvenienced by the beam or the actuating drum, as would be the case were it necessary to draw in with the comb in the position shown in Fig. 1. The upturned guide portions 79 of the comb support are provided with ears 89 in which a shaft 90 is rotatably mounted; said shaft having attached to it and wound around it two cords or other flexible connections 91, the free ends of said connections being attached to the comb frame, as shown in Figs. 1 and 2, near its ends, whereby by turning the shaft in one direction or the other, the comb may be adjusted vertically.

In order to retain the comb in adjusted position, I attach to the shaft two notched or ratchet-like disks 92, with which coöperate stop-pawls 93 fulcrumed on the upright portions of the swinging support. As the connections 91 are attached to the comb frame near its ends and two locking devices for the shaft 90 are adjacent such connections, the

comb when adjusted is maintained level and any twisting of the shaft is prevented. The sheet of warp W after leaving the usual sizing box and drying devices, passes round a guide-roll 94 to be hereinafter referred to, near the lower part of the frame at its left hand end, Fig. 1, thence up around a guide-roll 95 mounted in fixed bearings on the frame, and beneath a smaller depressing roll 96, the journals of this roll being mounted in brackets, as shown at 97, Fig. 1, attached to the main frame. These brackets have slotted bearings 98 for the journals of two guide-rolls 99 and 100, and referring to Fig. 1, it will be seen that these two rolls are above and adjacent the periphery of the tension cylinder 17. After passing under the depressing roll 96, the sheet of warp is carried around the roll 99, and between it and the tension cylinder 17 and around the latter, thence up, around and over the guide-roll 100, through the comb and around the guide-roll 76 to the beam. The rolls 76 and 100 are so located that practically the portion of the warp between them is substantially horizontal as it passes through the comb.

The winding of the warp around the cylinder 17 exerts a proper amount of tension on the warp, on its passage to the beam. When a sheet of warp is first started through the part of the slasher shown in Fig. 1, the sheet has not attained its full width, and at such time a smooth-surfaced roll 101 is brought into position to guide the threads and to permit them to spread into parallelism as the sheet widens. After the run of the warp has become established, however, the threads then being in substantial parallelism, a roll 94 is provided with an annularly scored or grooved surface, the scores or grooves being at right angles to the axis of the roll, the warp threads as they pass around this roll being guided by the scoring, the main object of the scoring being to separate one from the other such threads as may stick together by the sizing. Herein I have mounted the journals of the rolls on a pivotally mounted support comprising a shaft 102, Figs. 1, 6 and 7, rotatably mounted in bearings on the main frame-sides, and having attached arms 103 provided with bearings for the journals of the two rolls 94 and 101, respectively, said rolls being located diametrically opposite each other, see Figs. 1 and 7. The shaft 102 is at one end carried outside the main frame, and has an attached crank handle 104, by which rotative movement can be imparted to the shaft, to thereby swing the supports 103, and move one of the rolls from operative position and replace it by the other roll.

In the drawings I have shown the scored roll 94 in its operative position, and to substitute the smooth-surfaced roll 101, the handle 104 is swung upward and rearward, viewing Fig. 1, until the position of the two rolls is just reversed. It will be noted that during such change of the rolls, the sheet of warp is not released from control of at least one roll, for the roll 94 will remain in engagement with the warp until the roll 101 has been brought into engagement with the warp. Inasmuch as the strain or pull of the warp would tend to displace the desired roll, a locking means is provided for the roll-support to hold it in one or the other position. The locking means is herein shown as comprising a collar 105 rigidly attached to the shaft 102, and a coöperating locking or latch-member 106 fulcrumed at 107 on the main frame.

The collar as best shown in Fig. 8 is provided with a radial lug 108, and with an opposite radial and L-shaped lug 110, the latter resting upon a stop 109 built on the frame side 1, when the roll is in its operative position, while at such time the lug 108 enters a transverse recess 111 in the latch member 106, as shown in Fig. 7. While the parts remain in this position, the roll-support cannot be turned for the lug 110 bears against the stop 109, and is held there by the coöperation of the latch-member 106 with the lug 108. If the rolls are to be changed and the roll 101 operatively positioned, the latch member is swung to the right, viewing Fig. 7, releasing the lug 108, and then the handle 104 is swung through an arc of 180°, just transposing the position of the two guide rolls 94 and 101. The lug 110 by this movement is brought into position to coöperate with the latch-member 106, and the latter is swung back into the position shown in Fig. 7, to permit the lug 110 to enter the recess 111. The change in the positioning of the rolls is easily and quickly effected and after such change, the desired roll is positively locked in its operative position.

My invention is not restricted to the precise construction and arrangement herein shown and described, as the same may be modified or varied in different particulars by those skilled in the art without departing from the spirit and scope of my invention.

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

1. In a slasher, a drum shaft, an extensible beam-actuating drum thereon comprising two heads rotatable with the shaft and movable toward and from each other, a cylindrical barrel composed of two alternating series of elements, each series being rigidly attached at one end to one of the heads, and at its other end extended past the inner end of the other series, and means operatively connected with the inner ends of the series of elements to vary the distance between the heads to thereby change the effective length of the drum, an element of one series sliding longitudinally between and being laterally

supported by the two adjacent elements of the other series.

2. In a slasher, a rotatable shaft, drumheads rotatable therewith and movable toward and from each other, a barrel composed of a series of laterally separated bars attached at one end to each of the heads, the bars of one series sliding longitudinally between the bars of the other series, an internal annular support for the other end of each series of bars, the support for each series of bars being nearer the head to which the other series is attached, and means to move one of said supports toward and from the adjacent head, to decrease or increase, respectively, the distance between the heads and thereby vary the effective length of the drum.

3. In a slasher, a rotatable shaft, drumheads rotatable therewith and movable toward and from each other, a barrel composed of a series of laterally separated bars attached at one end to each of the heads, the bars of one series sliding longitudinally between the bars of the other series, an internal annular support for and rigidly attached to the other end of each series of bars, the support for each series of bars being nearer the head to which the other series is attached, threaded bosses in one of the supports, screw-threaded shafts extended therethrough and rotatably mounted in the adjacent head but held from longitudinal movement therein, and means to rotate said shafts in unison to move the connected support toward or from the said adjacent head, to thereby decrease or increase the distance between the drumheads.

4. In a slasher, a rotatable shaft, drumheads rotatable therewith and movable toward and from each other, a series of elongated, laterally separated bars rigidly attached at one end to each head, the opposite ends of the bars of the two series passing each other, said bars having convexed faces and radial sides, each bar of one series sliding longitudinally between and being laterally supported by the two adjacent bars of the other series, to constitute a cylindrical barrel of variable length for the drum, and means operatively connected with the ends of the bars farthest from the heads to vary the distance between the heads.

5. In a slasher, a rotatable shaft, drumheads rotatable therewith and movable toward and from each other, a series of elongated, laterally separated bars rigidly attached at one end to each head, said bars having convexed faces and radial sides, each bar of one series sliding longitudinally between and being laterally supported by the two adjacent bars of the other series, to constitute a cylindrical barrel of variable length for the drum, two annular supports keyed to the shaft between the heads, the free ends of the bars of one head being attached to the opposite support, screw-shafts rotatably supported in the supports and coöperating with threaded bosses on one of them, said threaded bosses, means on the adjacent head to prevent longitudinal movement of the shafts, and means to effect simultaneous rotation of the screw-shafts to separate the heads or draw them toward each other.

6. In a slasher, a positively-driven actuating drum, a beam on which the warp is wound, driven by frictional contact with the drum, swinging carriers for the beam, a rotatable sheave, a flexible connection wound thereon and attached to the beam-supporting means, to press the same against the drum, a friction let-off to control rotation of the sheave and the unwinding of the connection therefrom as the diameter of the warp mass on the beam increases, and normally inoperative means to rotate the sheave and wind the connection thereon.

7. In a slasher, a positively-driven actuating drum, a beam on which the warp is wound, driven by frictional contact with the drum, swinging carriers for the beam, a rotatable sheave, a flexible connection wound thereon and attached to the beam-supporting means, to press the same against the drum, a friction let-off to control unwinding of the connection as the warp is wound onto the beam, and a pawl and ratchet device to rotate the sheave and wind the connection thereon.

8. A slasher having in combination a beam on which the sheet of warp is to be wound, means to rotate said beam and wind the warp thereupon, fixedly-positioned guide-rolls for the sheet of warp, a comb between said guide-rolls and the beam and through which the warp passes, a normally stationary support on which the comb is mounted above the beam, and a fulcrum for said support below the beam, the support being adapted to be swung forward on its fulcrum to facilitate the introduction of the warp to the comb.

9. In a slasher, a beam on which the warp is wound, means to rotate it, a comb, a swinging support for and to normally position the comb above and back of the beam, a fixed fulcrum for the support below the beam, and means to lock the support in stationary operative position, forward movement of the support bringing the comb into convenient position for the introduction of the warp.

10. In a slasher, a beam on which the warp is wound, means to rotate it, a comb, a swinging support fulcrumed below the beam and having upright guide-ways above the beam for and in which the comb is vertically adjustable, and means carried by the swinging support to vary the vertical position of the comb in the guideways.

11. In a slasher, a beam on which the warp is wound, means to rotate it, a comb, a frame in which it is carried, a swinging sup-

port fulcrumed below the beam and having upright guide-ways in which the frame is vertically movable, a transverse shaft rotatably mounted in the swinging support above the guideways, flexible connections between the comb-frame and shaft and wound around the latter, to suspend the comb, and means to hold the shaft from rotation after the vertical position of the comb has been changed by rotation of the shaft.

12. In a slasher, a warp beam, an actuating drum to rotate the same by frictional contact, a scored guide-roll and a smooth guide-roll for the warp, a pivoted support on which both rolls are mounted, and means to turn the support to bring one or the other of said rolls into engagement with the warp.

13. In a slasher, a warp beam, an actuating drum to rotate the same by frictional contact, a scored guide-roll and a smooth guide-roll for the warp, a pivoted support on which both rolls are mounted, and means to turn the support to bring one or the other roll into engagement with the warp, and a locking device for the support, to retain the selected roll in operative position.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALONZO E. RHOADES.

Witnesses:
CLARE H. DRAPER,
FRANK J. DITCHER.