

Sept. 19, 1933.

R. H. CARTER

1,927,307

STROKE CHANGING MECHANISM

Filed July 5, 1932

3 Sheets-Sheet 1

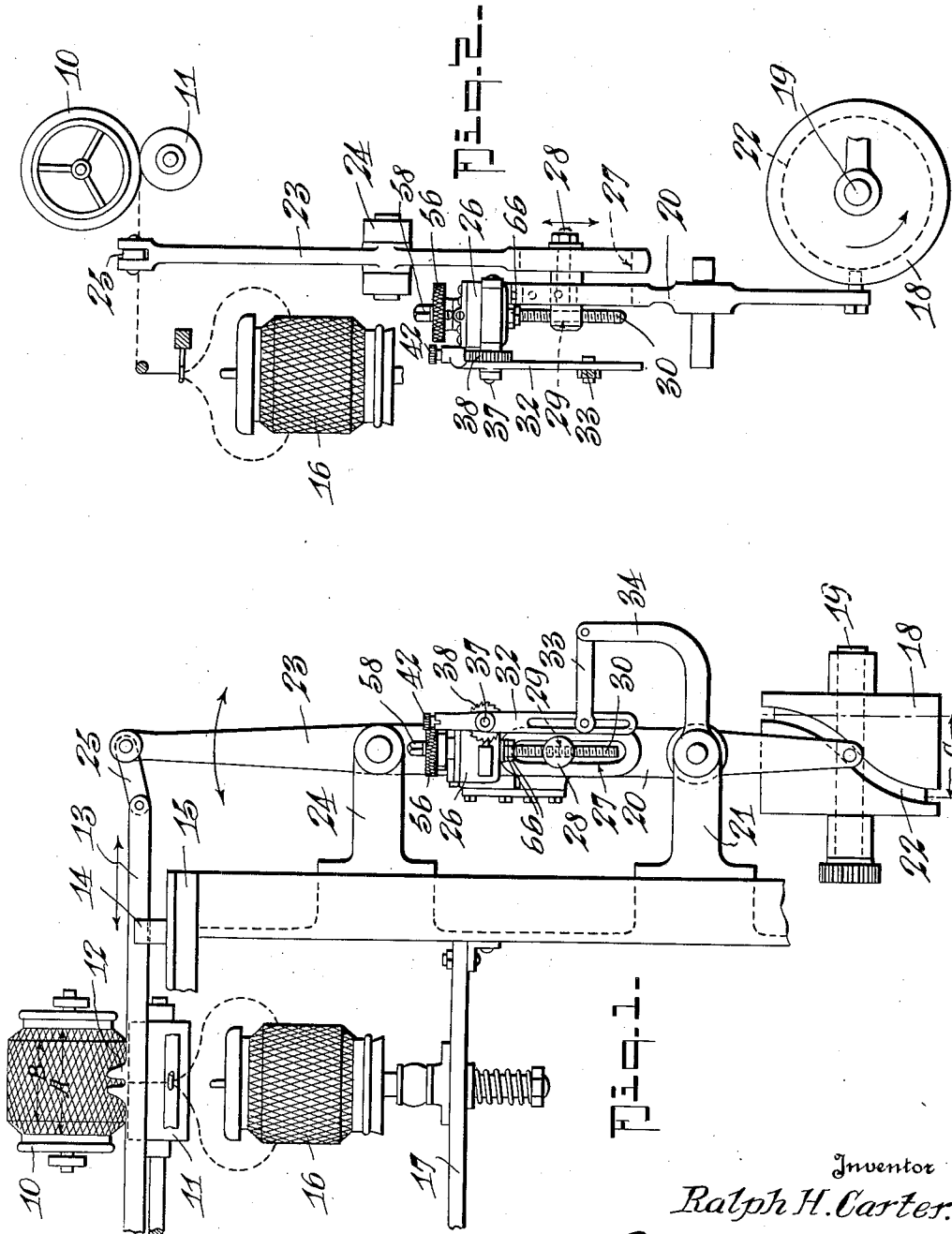


Fig. 1--

Inventor
Ralph H. Carter.

Thomas A. Bryer
Attorney

Sept. 19, 1933.

R. H. CARTER

1,927,307

STROKE CHANGING MECHANISM

Filed July 5, 1932

3 Sheets-Sheet 2

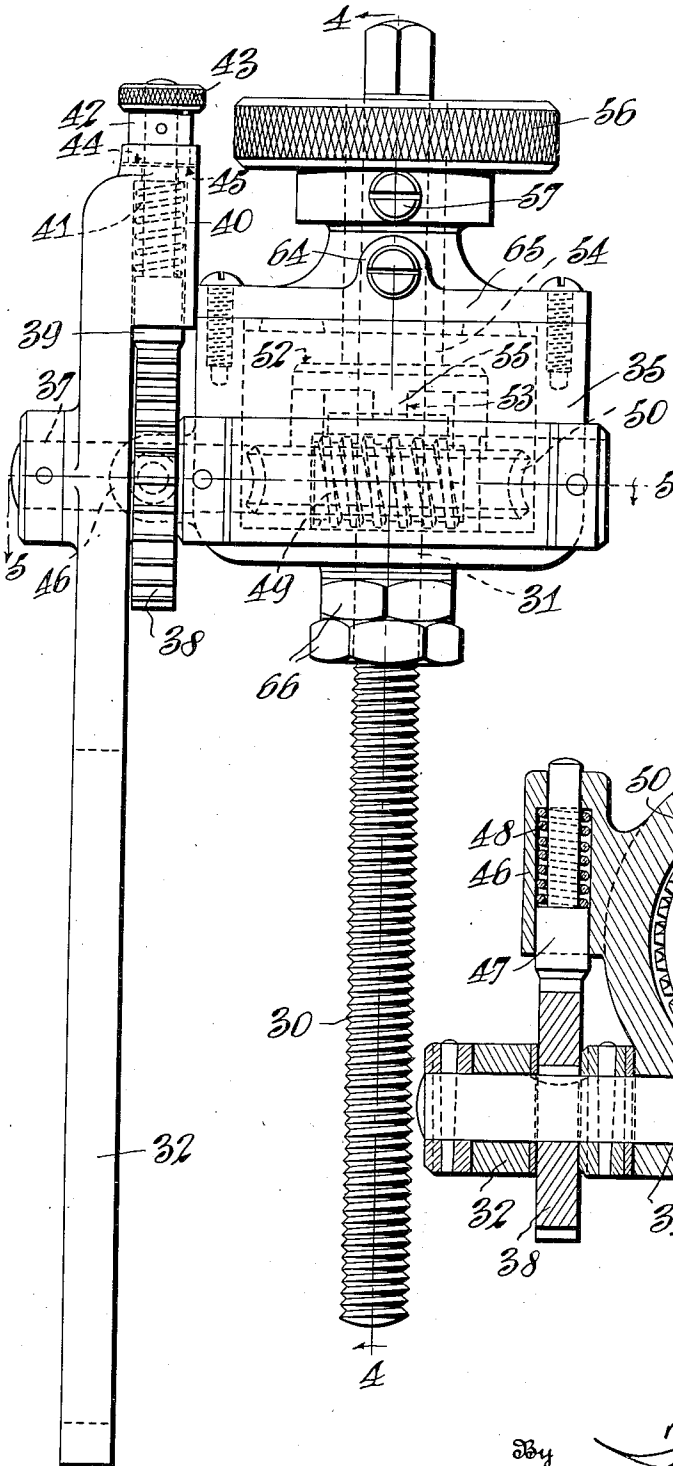
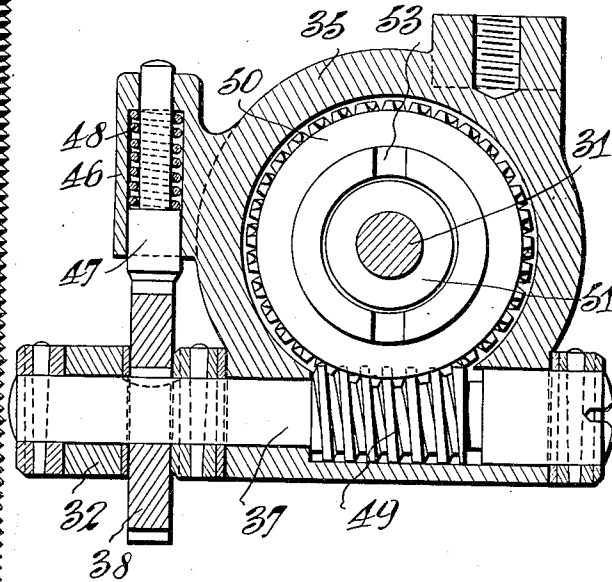


Fig. 3.

Fig. 5.



Inventor
Ralph H. Carter.

By

Thomas H. Byrnes

Attorney

Sept. 19, 1933.

R. H. CARTER
STROKE CHANGING MECHANISM

1,927,307

Filed July 5, 1932

3 Sheets-Sheet 3

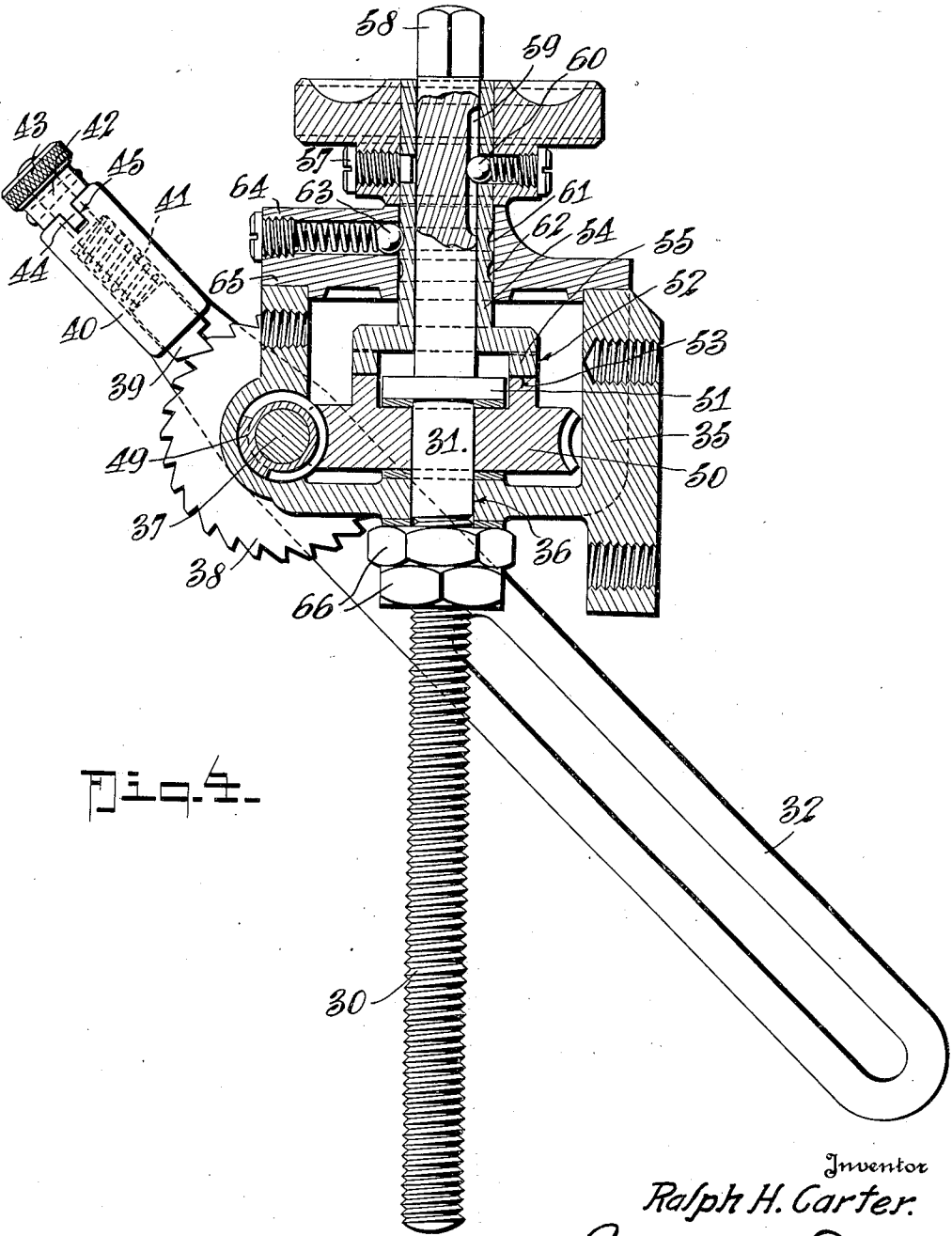


Fig. 4.

Inventor
Ralph H. Carter.
By *Thomas H. Byron*
Attorney

UNITED STATES PATENT OFFICE

1,927,307

STROKE CHANGING MECHANISM

Ralph H. Carter, Johnson City, Tenn., assignor
to American Glanzstoff Corporation, New
York, N. Y., a corporation of Delaware

Application July 5, 1932. Serial No. 620,934

7 Claims. (Cl. 74-14)

My present invention relates to improvements in machines for the manufacture of threads and filaments and more particularly to a stroke changing means, whereby the length of throw of the thread guide means for said machine may be changed automatically during the operation thereof.

ment of the stroke changing device will produce the desired results.

A still further object of my present invention is to provide a stroke changing device which automatically increases or decreases the length of stroke of the thread guide by constantly varying the length of throw of the thread guide actuating means.

These and other objects of my present invention will become more apparent from a study of the following description, and by reference to the following drawings in which:

Figure 1 is a view of one end of a machine, in this instance a twisting machine, and showing the relation of the automatic stroke changing device thereto;

Figure 2 is an end elevation of the same;

Figure 3 is a detailed view of the automatic stroke changing device mechanism;

Figure 4 is a sectional view taken along the lines 4-4 of Figure 3; and

Figure 5 is another sectional view taken along the lines 5-5 of Figure 3.

Referring now to the drawings, and more particularly to Figure 1, I have shown a take-up spool 10 driven by a conventional take-up roller 11. The thread is distributed on the outer surface of the spool by means of a thread guide 12 which is secured to an oscillating or reciprocating thread guide rod 13 journaled in a bearing 14 located on the standard or other support 15. The thread is led upwardly from the twisting spool 16 secured to a suitable spindle mounted on the member 17 which extends the length of the machine.

The desired motion is imparted to the thread guide rod by means of a barrel cam 18 secured to the shaft 19 and which is driven from any suitable source of power (not shown). It is to be understood, however, that cams of any standard type may be used if desired. A lever 20 is pivotally mounted on the bracket 21 and is provided, at one end, with a cam follower which rides in the cam track 22. A second lever 23 is pivotally mounted on the bracket 24 and is connected to the upper end of the lever 20 by a connection to be hereafter described. A link 25 connects the thread guide rod to the lever 23 and prevents the occurrence of any binding action between the thread guide rod and actuating lever. The length of thread guide stroke depends upon the design of the cam, and upon the lever arms 20 and 23 of the traverse thread guide rod 13 and in the embodiment shown the length of stroke corresponds to the distance A and is

In the production of threads and the like of the type which is produced by the regeneration of cellulose or from compounds thereof, it is usually necessary to impart to the thread a definite twist which may vary in amount depending upon the type of thread produced. To accomplish this the thread is led upwardly from a twisting spool, over an oscillating or reciprocating thread guide, and wound on a take-up spool driven by what is known as a take-up roller. The mechanism used to impart to the thread guide the desired movement has been found to be rather unsatisfactory. A "crust" is formed on each end of the yarn body which prevents the liquids used in the after treatment of the yarn from passing therethrough. This crust formation is particularly evident when a cylindrical wind is used and is due, in part, to the fact that the thread at each end of the spool has a tendency to slip and to bunch forming a thickness of yarn which is, for all practical purposes, impermeable to the treating liquids.

It is, therefore, an object of my present invention to provide means whereby the length of stroke may be progressively decreased during the winding of thread on a take-up spool, and by this method provide a yarn body having evenly tapered ends through which the treating liquids will flow evenly.

Another object of my present invention is to provide a suitable attachment for progressively reducing the length of the thread guide stroke, and which may be easily attached to a twisting or other machine, the attachment thereof necessitating very few changes in the designs of the standard machines now in use.

A further object of my present invention is to provide an automatic stroke changing attachment for a twisting or other machine by which the thread wound on the take-up spool is built up in the form of a yarn body having tapered or slanting ends. If desired, the ends thereof may taper outwardly from the top to the bottom of the yarn body; or if the thread is wound on spools which require the ends of the yarn body to be tapered so that the outer layers are greater in extent than the bottom layers, a slight adjust-

governed by the distance C—C or the effective width of the cam track.

The stroke changing device, designated generally by the reference character 26, is bolted or otherwise secured to the upper end of the lever 20. The lower end of the lever 23 is provided with elongated slot 27, in which is movably secured a bolt 28 having a threaded opening 29 formed at one end thereof in which the end 30 of the shaft 31 of the stroke changing device is threaded. The oscillation of the lever 20 imparts a similar oscillation to the lever 23. At each oscillation the shaft 31 is turned moving the bolt in the elongated slot formed in the lever 23. Hence with each oscillation of the lever 23 the connection between the lever is constantly moved changing the pivotal point thereof and thus changing the arc in which the said lever oscillates.

The turning of the shaft is obtained by securing the handle or arm 32 of the stroke changing device to a link 33 which is pivotally secured to the up-standing arm 34 of the bracket 21. The handle or arm is slotted, providing an adjustable connection between the said arm and link. With each oscillation of the thread guide actuating means the arm 32 through mechanism to be hereafter described causes the desired rotation of the shaft.

Referring now more particularly to Figures 3, 4 and 5, I have shown in detail the operative construction of the stroke changing device. The attachment consists of a housing or casing 35 having formed in the bottom thereof an opening or bore 36 in which is journaled the shaft 31. The handle or arm 32 is rotatably mounted on a horizontally extending shaft 37 to which is keyed or otherwise secured a ratchet 38 actuated by a pawl 39 mounted in a housing 40 formed in one end of the handle or arm 32. A spring 41 is positioned between the enlarged end of the pawl and the rear wall of the housing 40 and resiliently holds the pawl in engagement with the ratchet. The outer end of the pawl is provided with a knob 42 which is provided, if desired, with a knurled portion 43. The outer end of the pawl is also provided with projecting keys or lugs 44 adapted to be located in the slots 45 formed in the end of the lever. By this construction the pawl, when it is desired to throw the attachment out of operative engagement, may be moved against the pressure of the spring to an extent sufficient to remove the keys or lugs from the slots. By then turning the pawl slightly the keys or lugs will be moved out of engagement with the said slots and will rest against the end of the lever, thus holding the pawl out of engagement with the ratchet. Mounted in a housing 46, formed in the main housing or casing, is a pawl 47 which is held in engagement with the teeth of the ratchet by means of a spring 48. The direction in which the attachment operates is controlled by the direction of the ratchet teeth and the direction in which the pawls 39 and 47 are set. The pawl 47 is provided to hold the ratchet against movement while the pawl 39 is moving in the reverse direction.

A worm 49 is secured to the shaft 37 and meshes with a worm gear 50 rotatably mounted on the vertically extending shaft 31. Washers are positioned between the worm gear and the bottom of the housing, and the shaft is provided with a shoulder 51 directly above the said worm gear to prevent any upward or downward movement thereof.

The rotary movement of the worm gear is transmitted to the shaft 31 by means of a clutch mechanism designated generally by the reference character 52. The worm gear is provided with an upwardly extending section in which a plurality of recesses 53 are formed. A sleeve 54 is secured by means to be hereafter described to the shaft 31 and is provided at its lower end with a plate having downwardly-projecting lugs 55 which engage in the recesses 53. A clutch knob is secured to the upper end of said sleeve by means of the bolt or screw 57.

Wrench engaging means 58 are formed on the upper end of the shaft 31 and a vertically extending groove 59 is provided directly therebelow in which the spring pressed ball 60 located in the housing 61 is adapted to ride. This spring pressed ball acts as a key to connect the shaft 31 and the sleeve together, and also performs the additional function of a safety device. If the operative parts of the stroke changing device become jammed, or if there happens to be any binding of the device, the ball will be forced out of engagement with the groove stopping further rotation of said shaft. Consequently any damage to the device will be avoided.

To enable the clutch to be held in either operative or inoperative position I have provided the sleeve with a pair of annular grooves 61 and 62 in which the spring pressed ball 63, located in a housing 64 formed in the cover plate 65, may selectively engage. The cover plate is bolted or otherwise secured to the casing 35. The shaft itself is held against vertical movement by any suitable means such as a locking arrangement 66.

In operation oscillatory motion is imparted to the levers 20 and 23 by means of the cam. Since the link 33, secured to the handle or arm, is fixed relative to such movement and the attachment is bolted to the lever 20, each oscillation of said levers will cause the ratchet to be moved by the pawl 39 rotating the worm and worm gear. This motion is transmitted to the shaft through the clutch mechanism 52 and sleeve 54. Since the bolt 28 connecting the levers 20 and 24 is threadedly secured to the lower end of the shaft the normal rotation of the latter will cause the bolt to be moved downwardly in the slots formed in said levers shortening the distance between the pivotal point of the lever 20 and the said bolt 28. This will necessarily result in decreasing the oscillation of the lever causing a corresponding decrease in the length of stroke of the thread guide rod. By this operation of the stroke changing device the thread layers will be built up as shown in Figure 1, starting at A and ending the doff at B.

The stroke changing device may be thrown out of operation either by lifting the pawl 39 out of engagement with the ratchet or by raising the clutch knob 57. The raising of the clutch knob will move the sleeve attached thereto, disengaging the spring pressed ball 63 from the lower groove 61 and allowing it to be moved into engagement with the upper groove, holding the clutch parts out of engagement with each other. Consequently, the shaft 31 will not be rotated by the worm gear and there will be no change in the length of stroke of the thread guide. If it is desired, the attachment can be maintained in inoperative position until a predetermined number of layers of thread have been placed on the spool and then the attachment can be moved instantly into operative position. If this method is used the tapered portion of the thread body

is given a firm and solid foundation. After the doff is finished and the stroke has been decreased the desired amount the clutch knob is pulled upwardly disengaging the clutch as outlined above.

5 From the above description it will readily be appreciated that I have provided a simple and efficient mechanism whereby a yarn body may be formed having the slanting ends thereof built up in such a manner that the treating liquids used
10 in the after treatment of the yarn will pass evenly therethrough. Moreover, the stroke changing device is so constructed as to be easily attached to machines of standard construction without requiring the re-arrangement of the parts thereof.
15 Although the foregoing description has been directed specifically to the construction illustrated it is obvious to those skilled in the art that the device may be modified in many mechanical details without departing from the spirit or scope
20 of the invention and I therefore desire it to be understood that I reserve the privilege of resorting to all mechanical changes to which the device is susceptible, the invention being defined and limited only by the scope of the appended
25 claims.

Having now described my invention as required by the patent statutes what I desire to claim as new is:

1. In a machine of the class and for the purpose
30 described, the combination of a traverse bar, means for reciprocating said traverse bar, comprising, a lever pivotally secured thereto, a second lever, means connecting said levers, means for oscillating said levers, means progressively to
35 decrease the length of stroke of said traverse bar comprising a housing secured to said second lever, a screw journaled therein and having one end operatively connected to said lever connecting
40 means, a ratchet operatively connected to said screw, and means to actuate said ratchet comprising a lever arm carrying pawl.

2. In a machine of the class and for the purpose described, the combination of a traverse bar, means for reciprocating said traverse bar, comprising, a lever pivotally secured thereto, a second
45 lever, means connecting said levers, means for oscillating said levers, means progressively to decrease the length of stroke of said traverse bar comprising a housing secured to said second lever, a screw journaled therein and having one end
50 operatively connected to said lever connecting means, a ratchet device operatively connected to said screw and means to actuate said ratchet device, whereby said lever connecting means is shifted to reduce the arc of oscillation of said
55 levers, and means to disengage the connection between said ratchet and spool.

3. In a machine of the class and for the purpose described, the combination of a traverse bar, means for reciprocating said traverse bar, comprising, a lever pivotally secured thereto, a second
60 lever, means connecting said levers, means for oscillating said levers, means progressively to decrease the length of stroke of said traverse bar
65

comprising a housing secured to said second lever, a screw journaled therein and having one end operatively connected to said lever connecting means, a ratchet operatively connected to said screw, and means to actuate said ratchet comprising a lever arm carrying pawl, and means to disengage the connection between said ratchet and spool.

4. In a machine of the class and for the purpose described, the combination of a traverse bar, means for reciprocating said traverse bar, comprising, a lever pivotally secured thereto, a second lever, means connecting said levers, means for oscillating said levers, means progressively to decrease the length of stroke of said traverse bar comprising a housing secured to said second lever, a screw journaled therein and having one end operatively connected to said lever connecting means, a ratchet operatively connected to said screw, and means to actuate said ratchet comprising a lever arm carrying pawl linkage connecting said arm to said machine whereby the screw is rotated upon each oscillation of said lever.

5. In a machine of the class and for the purpose described, the combination of a traverse bar, means for reciprocating said traverse bar comprising a lever pivotally secured thereto, a second lever, means for oscillating said lever, means progressively to decrease the length of stroke of said traverse bar comprising a housing secured to said second lever, a screw journaled therein and having one end operatively connected to said lever connecting means, a ratchet, a clutch mechanism operatively connecting said ratchet to said screw and means to actuate said ratchet.

6. In a machine of the class and for the purpose described, the combination of a traverse bar, means for reciprocating said traverse bar comprising a lever pivotally secured thereto, a second lever, means for oscillating said lever, means progressively to decrease the length of stroke of said traverse bar comprising a housing secured to said second lever, a screw journaled therein and having one end operatively connected to said lever connecting means, a ratchet, a clutch mechanism operatively connecting said ratchet to said screw and means to actuate said ratchet, means on said housing to hold said ratchet against reverse movement.

7. In a machine of the class and for the purpose described, the combination of a traverse bar, means for reciprocating said traverse bar comprising a lever pivotally secured thereto, a second lever, means for oscillating said lever, means progressively to decrease the length of stroke of said traverse bar comprising a housing secured to said second lever, a screw journaled therein and having one end operatively connected to said lever connecting means, a ratchet, a clutch mechanism operatively connecting said ratchet to said screw and means to actuate said ratchet, a pawl on said housing adapted to hold said ratchet against reverse movement.

RALPH H. CARTER.