Dec. 5, 1933. P. J. THOMAS 1,938,504

DOUBLING AND TWISTING MACHINE

Filed April 12, 1932 5 Sheets-Sheet 1

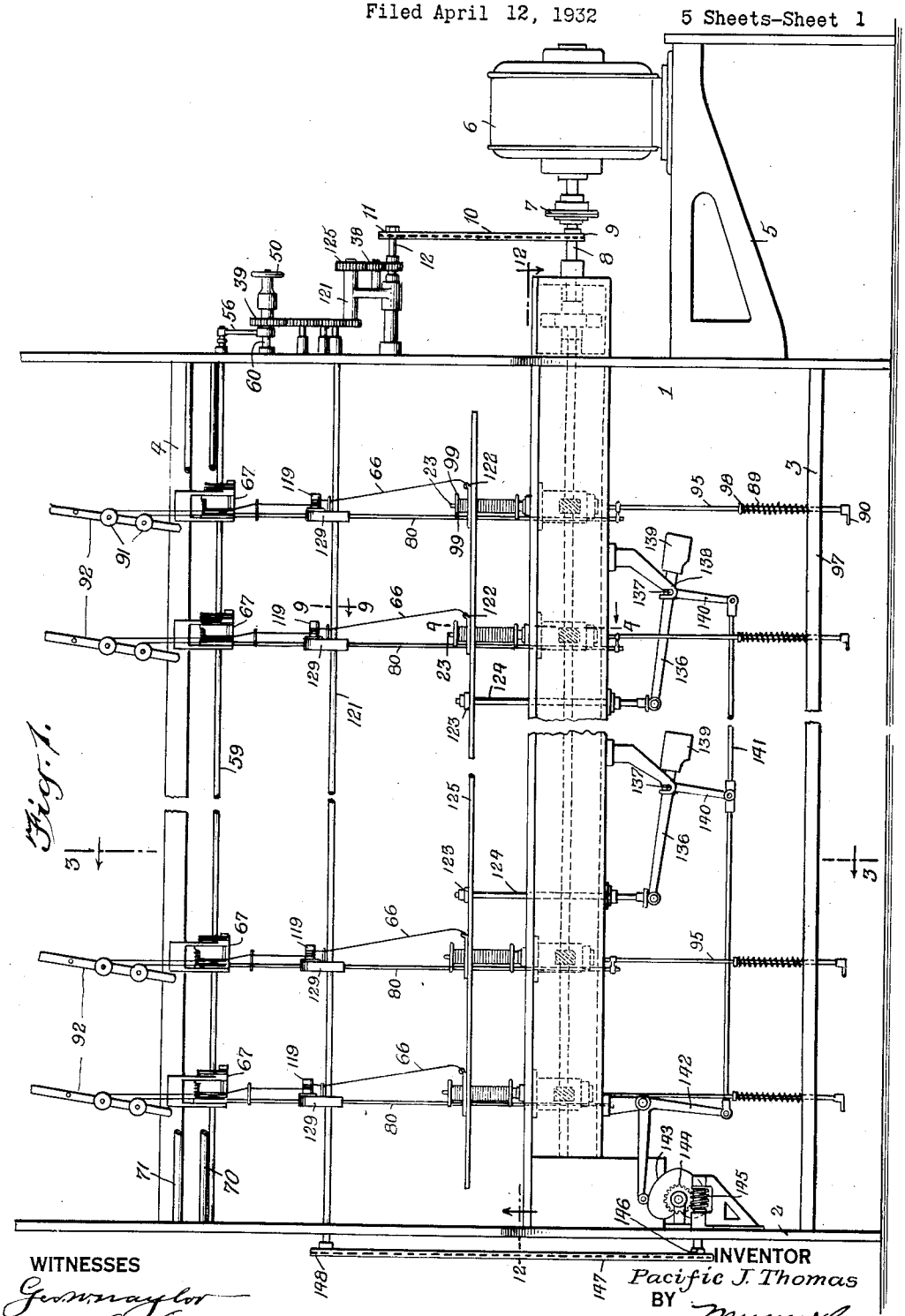


Fig. 1.

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Fig. 4.

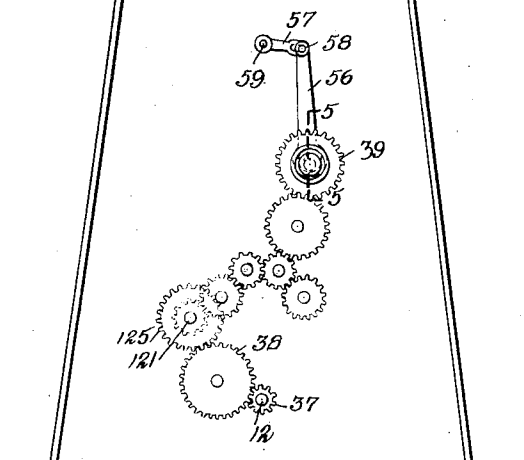
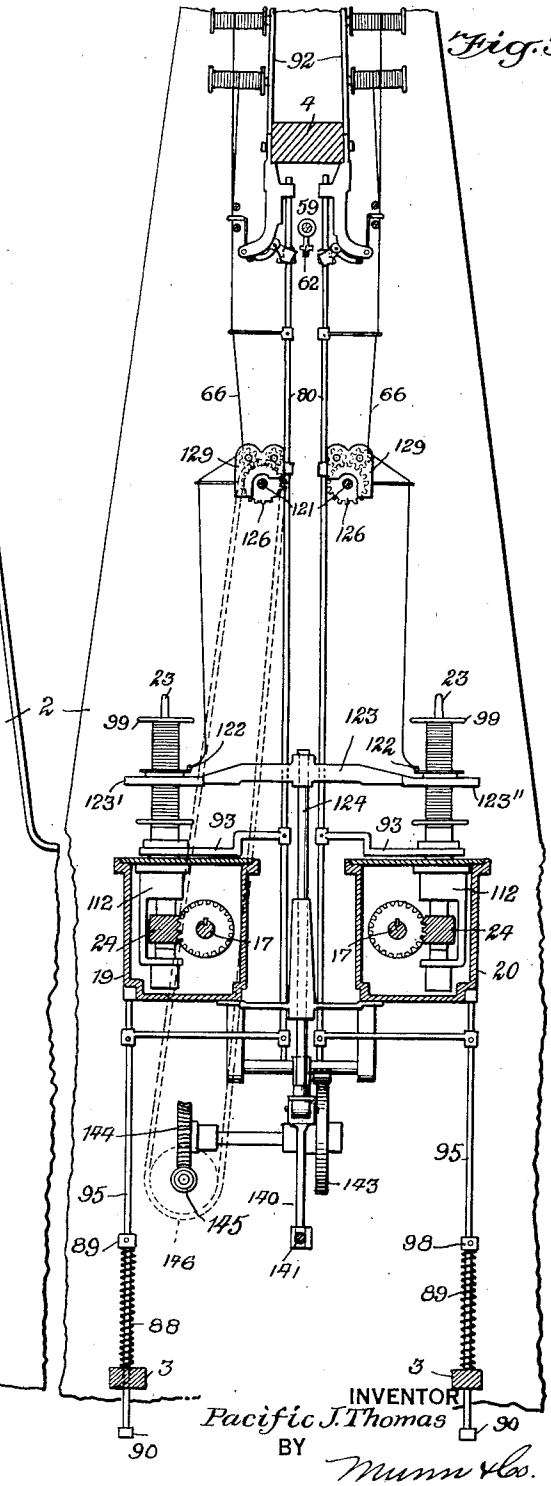


Fig. 3.



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DOUBLING AND TWISTING MACHINE

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Fig. 4.

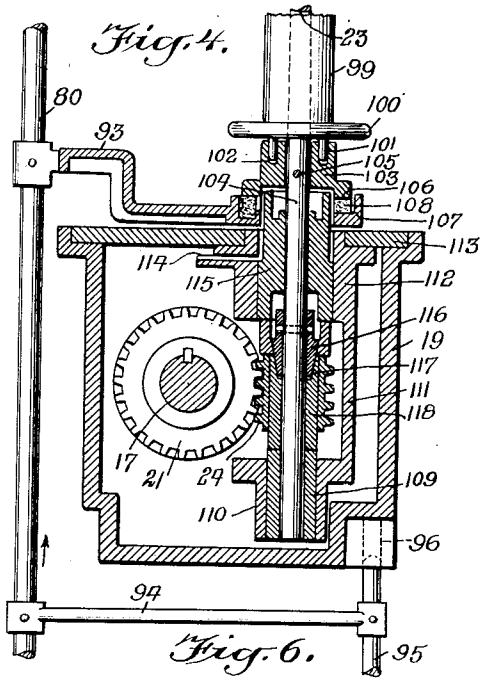


Fig. 5.

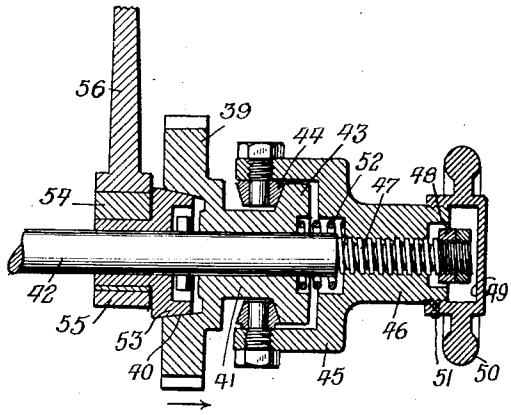


Fig. 6.

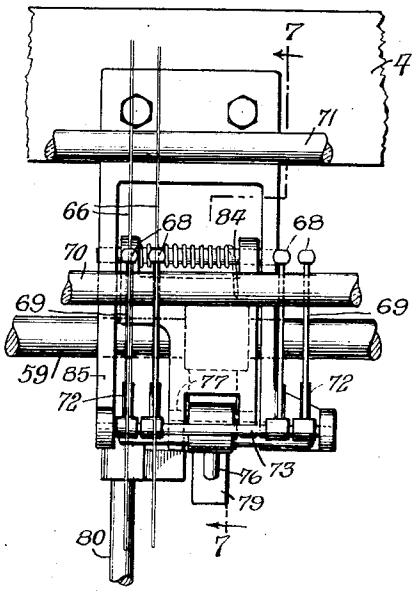
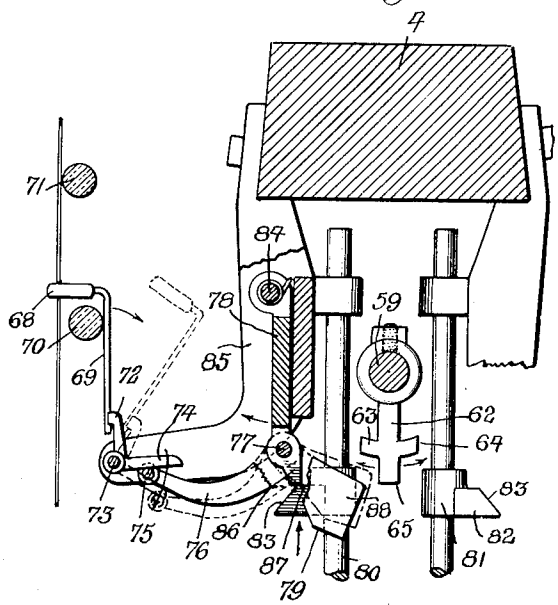


Fig. 7.



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DOUBLING AND TWISTING MACHINE

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Fig. 8.

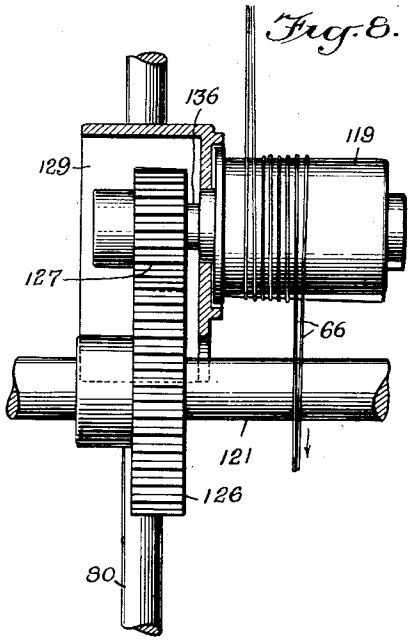


Fig. 9.

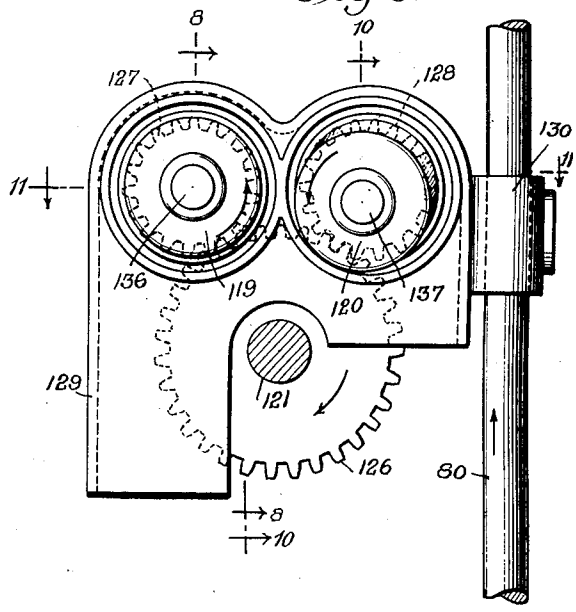


Fig. 10.

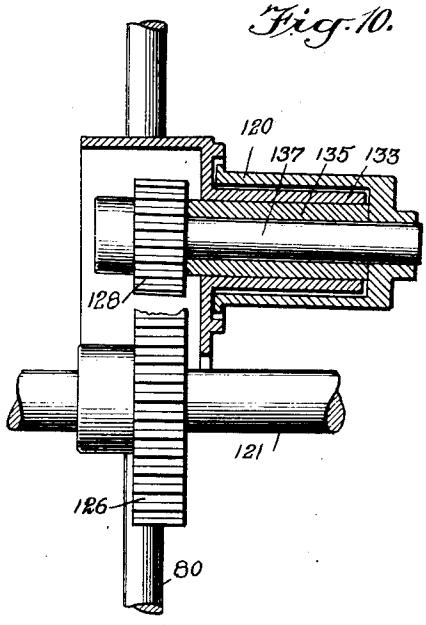
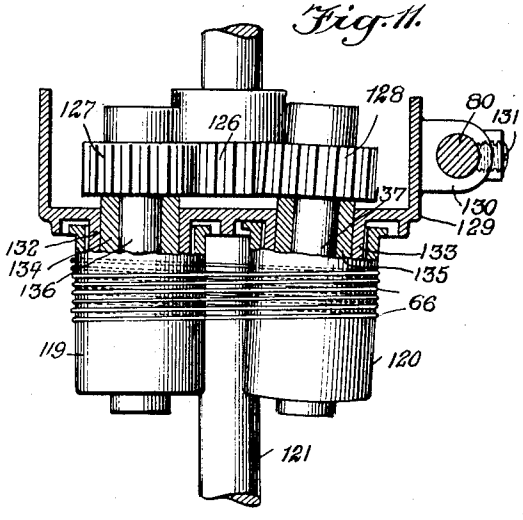


Fig. 11.



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DOUBLING AND TWISTING MACHINE

Filed April 12, 1932 5 Sheets-Sheet 5

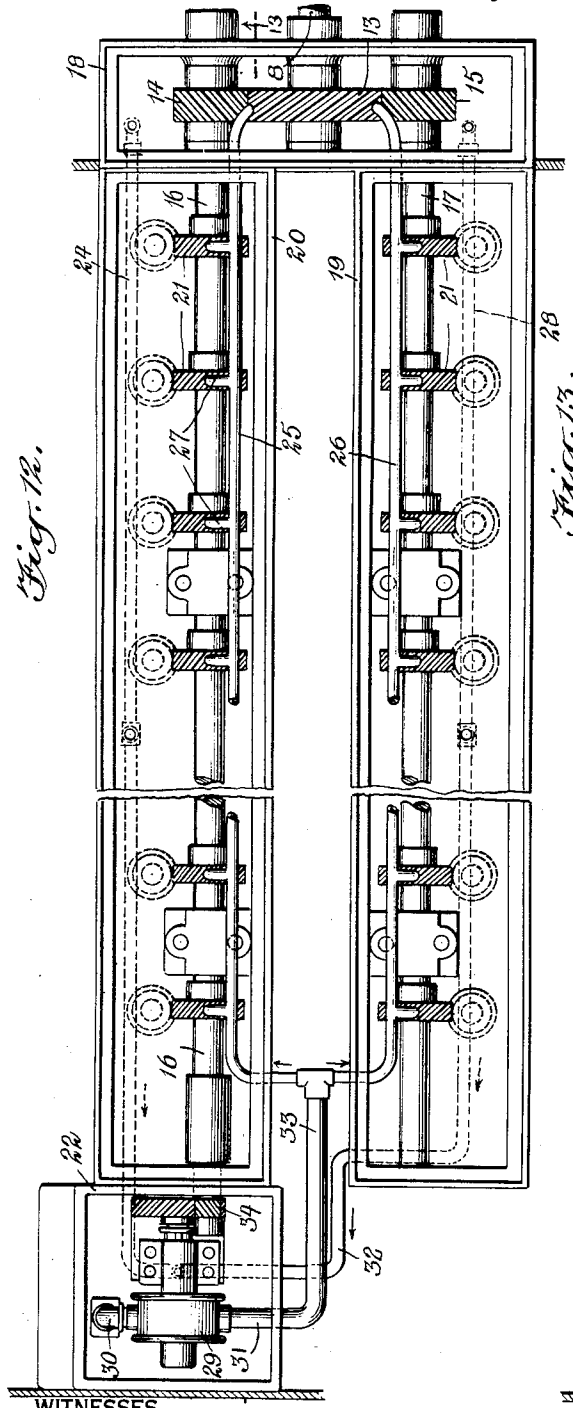


Fig. 12.

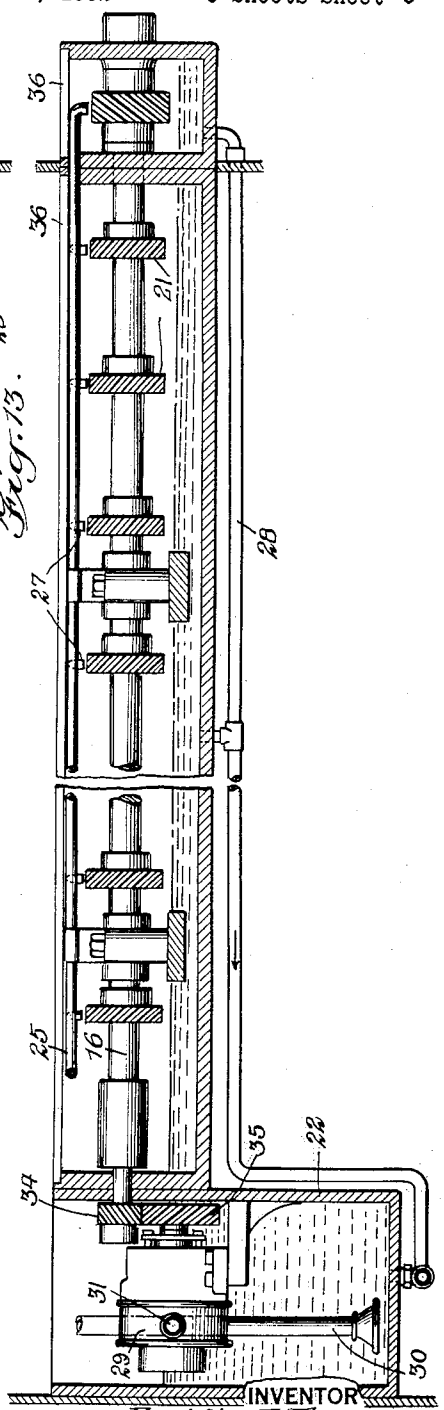


Fig. 13.

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Patented Dec. 5, 1933 1,938,504

UNITED STATES PATENT OFFICE

1,938,504

DOUBLING AND TWISTING MACHINE

Pacific J. Thomas, Wyoming, Pa.

Application April 12, 1932. Serial No. 604,823

10 Claims. (Cl. 117—21)

This invention relates to textile machines, and particularly, to an improved machine capable of twisting, and also, doubling and twisting silk or other thread, the object being to provide an improved construction wherein higher speed may be attained with the use of parts which will not readily get out of order.

Another object of the invention is to provide a doubling and twisting machine wherein the cones carrying the spools on which the thread is wound are driven through the use of driving shafts and gearing connected therewith.

A further object of the invention is to provide a doubling and twisting machine wherein the usual belts are eliminated and a particular system of gearing substituted, the gearing being associated with thread feeding means and other parts so that normally all parts will function at the desired speed, but when any one thread breaks, the mechanism associated therewith will stop.

A further object, more specifically, is to provide in a doubling and twisting machine a set of spreading and feeding rolls arranged to maintain the threads spread as they leave the feeding spools, and at the same time feed the threads to the winding spools at a certain rate in proportion to the speed of the winding spools.

In the accompanying drawings—

Figure 1 is a side view of a machine disclosing an embodiment of the invention, the center being broken away, and the ends brought nearer together in order to illustrate the structure.

Figure 2 is an end view on an enlarged scale of the structure shown in Figure 1, the upper and lower parts being broken away, said view looking at Figure 1 from the right.

Figure 3 is an enlarged sectional view through Figure 1 approximately on the line 3—3.

Figure 4 is an enlarged fragmentary sectional view through Figure 1 approximately on the line 4—4.

Figure 5 is an enlarged fragmentary sectional view through Figure 2 approximately on line 5—5.

Figure 6 is an enlarged front view of one group of stop mechanism shown in Figure 1.

Figure 7 is a sectional view through Figure 6 approximately on line 7—7.

Figure 8 is a sectional view through Figure 9 approximately on line 8—8.

Figure 9 is an enlarged fragmentary sectional view through Figure 1 approximately on line 9—9.

Figure 10 is a sectional view through Figure 9 on line 10—10.

Figure 11 is a transverse sectional view through Figure 9 on line 11—11.

Figure 12 is a horizontal longitudinal sectional view through Figure 1 approximately on line 12—12.

Figure 13 is a vertical sectional view through Figure 12 on line 13—13.

Referring to the accompanying drawings by numerals, 1 and 2 indicate end plates forming part of a frame. These plates are connected together by suitable bars 3, and also, by suitable top bar 4. These parts all form what may be termed a frame which carries certain stationary and moving parts hereinafter fully described. A bracket 5 is connected to plate 1, and on this bracket is mounted a motor 6, which is preferably an electric motor, connected by suitable coupling 7 to the shaft 8, which shaft carries a sprocket wheel 9 on which a sprocket chain 10 operates. This chain 10 also fits on to a sprocket wheel 11 secured to shaft 12, which shaft is connected to suitable gearing hereinafter fully described. Shaft 8 is keyed or otherwise rigidly secured to a gear wheel 13 (Figure 12) and gear wheel 13 is continually in mesh with the pinions 14 and 15 secured rigidly respectively to the shafts 16 and 17. The gear wheels 13 to 15 inclusive are preferably arranged in a box 18, which is preferably supplied with a suitable lubricant. As shown in Figure 13, the boxes or compartments 19 and 20 are also supplied with a lubricant, which may be at substantially any level, but preferably, not higher than the lower line of the respective gear wheels 21. Arranged at the end, opposite box 18, is a compartment or box 22, which is supplied with oil, and said oil is usually at approximately the same level as the oil in the boxes 19 and 20. Shafts 16 and 17 carry a number of gear wheels 21, there being one gear wheel for each of the spindles 23 (Figure 1). Associated with each of the gear wheels 21 is a pinion 24, said pinion meshing continually with the gear wheels 21. Preferably, these gears are of the spiral gear type and are arranged wholly within their respective box or compartment 19 or 20. In order to provide a proper lubricant to these gears, and also to the gears 13 to 15, supply pipes 25 and 26 extend longitudinally of the respective boxes 19 and 20 and into the box 18 where they discharge on to the respective gears the oil, lubricating these gears, and the excess drips down into the bottom of the box where it is drawn off,

filtered, and again forced through the supply pipes 25 and 26. In addition to discharging on to the gears 13 to 15 inclusive, there is a discharge nozzle 27 for each of the gears 21, and a slow discharge is continually provided, so that the various gears 21 and 24 are really operating in a bath of oil, though they are not submerged. In this way ample oil is always provided, and yet these gears may be operated at high speed without heating the oil, which might be the case if they were completely submerged. The respective pipes 28 have openings entering the respective boxes 18, 19 and 20, so that the oil may flow, preferably by gravity, into the lower part of the box 22, from which it is pumped by the rotary pump 29, said pump drawing the oil through the pipe 30 from near the bottom of the box 22, and discharging the same through pipe 31. The pipe 31 is connected to a suitable filter 32, which filter may be arranged at any desired point, and the discharge end of this filter is connected to suitable piping 33 and the pipes 25 and 26. During the operation of the machine the pump 29 is continually operating as shaft 16 carries a pinion 34 continually meshing with the gear wheel 35, which gear wheel is connected to the operating shaft of the pump. It will be understood that this pump may be of any desired kind, but of the rotary type. In Figures 12 and 13, the various boxes have been shown open, but it is evident that they are to be closed by suitable lids or closures, and as illustrated in Figure 3, suitable shoulders or offsets 36 are provided in each box for the reception of a cover which prevents dirt, dust, and the like from entering.

Referring again to the motor 6 and the way the same drives the sprocket chain 10, it will be seen that the shaft 12 is continually rotated during the operation of the motor. This shaft carries a pinion 37 which meshes with a suitable train of gears 38, the last of which is a large gear 39, shown particularly in Figures 2 and 5. By reason of this construction and arrangement the gear 39 is continually rotated as long as the motor is in operation. The various gears of the train 38 are proportioned to give a certain speed to the gear 39, and if a different speed is desired, one or more of the gears of this train may be changed to secure a different ratio of drive. As shown in Figure 5, the gear wheel 39 is provided with a cone socket 40, and with a hollow stem 41, into which extends the shaft 42. The stem 41 is provided with an annular flange 43 against which the rollers 44 operate, said rollers being carried by a fork member 45, said fork member having an internally threaded stem 46, into which the threaded portion 47 of shaft 42 is screwed. A pair of nuts 48 is screwed on to the end of shaft 42, said nuts being enclosed in a chamber 49 of hand wheel 50. This hand wheel is screwed on to the stem 46, a suitable set screw 51 acting to lock the hand wheel against rotation independent of the stem 46. The spring 52 is used to normally force the fork member 45 outwardly or away from the gear wheel 39. The cone socket 40 coacts with the cone clutch 53 slidably mounted on shaft 42, which is rigidly secured in a suitable fitting 60, said fitting being carried by the end plate 1. The cone clutch 53 carries an eccentric member 54 which is keyed or otherwise rigidly secured thereto. A strap 55 surrounds the eccentric 54 and is provided with an arm 56, which is connected to the arm 57 (Figure 2) by suitable pin 58. The arm 57 is rigidly secured to shaft 59, which shaft extends the full length of the machine and coacts with the various stop motion mechanisms thereof as hereinafter fully described. When the parts are in the position shown in Figure 5, the cone clutch 53 is engaging the cone socket 40, so that the rotation of the gear wheel 39 will rotate the eccentric 54, and, consequently, move the arm 56 upwardly and downwardly, thus rocking the shaft 59. When it is desired to stop the machine, or for any reason to stop the operation of the shaft 59, the hand wheel 50 is grasped and rotated, whereupon the spring 52 will be compressed and the gear wheel 39 pulled a very short distance away from the cone clutch 53, said distance being sufficient to produce a disconnection, whereby there will be no more power transmitted to the eccentric 54. This will not only stop the rocking action of shaft 54 but will stop the rocking action of the various swinging stops 62 which are rigidly secured thereto. These stops as shown in Figure 7 are provided with laterally extending arms 63 and 64, and a downwardly extending abutment 65. When one or more of the threads 66 break, the particular stop mechanism 67, carrying said thread, will function to stop the rotation of the spindle 23 associated therewith, and stop also the feeding mechanism associated therewith. When the thread has been tied and the parts readjusted, this part of the machine will start to function and continue to function until the thread again breaks. As shown in Figures 6 and 7, two threads 66 are illustrated, but the device is made of a size to accommodate one thread, if desired, or more than two. The detail structure illustrated in Figure 6 could accommodate seven threads, or, if preferred, it could be made larger to accommodate even more. Where one thread is being used, the same is merely being twisted, but if two or more threads are used, they are doubled and twisted. As illustrated in Figure 6, the two threads are fed through the stop motion mechanism and later doubled and twisted. As illustrated in this figure and also in Figure 7, these threads pass through suitable eyes 68, each eye being supported by a rod 69 normally resting against the bar 70. From these figures, and also from Figure 3, it will be noted that the threads pass in front of not only bar 70, but also bar 71, and that the guiding eyes 68 are arranged between each bar. Each of the rods 69 is rigidly secured to a bell crank lever 72 swingably mounted on the rod 73. The arm 74 of the lever 72 is of sufficient weight that when a thread breaks it will swing downwardly to the dotted position shown in Figure 7 and overbalance the eyes 68, so that it will swing to the right, as shown in Figure 7, and add the action of its weight to the arm 74 to press downwardly the rod 75, which is rigidly secured to a control lever 76, which lever is pivotly mounted on a rod 77 carried by a swinging plate 78. The lever 76 has a weighted extension 79 which is normally positioned to extend beyond the vertical rod 80, said rod being provided with a sleeve 81 rigidly secured to the rod and having an extension 82 provided with a cam surface 83. The plate 78 is pivotly mounted on the rod 84 which is carried by the frame or bracket 85, which frame is bolted or otherwise rigidly secured to the bar 4. Plate 78 is provided with an inclined downwardly extending cam 86 which normally rests on the top surface 87 of the extension 82. However, when the lever 76 swings downwardly, the weighted end 79 will swing upwardly to the dotted position shown in Figure 7, and, consequently, the abutment 65 will strike the

weighted end 79 substantially on the corner 88 and will swing the same to the left as shown in Figure 7, so that the extending cam 86 will be moved opposite the cam surface 83. This will allow the vertical rod 80 to move upwardly under the action of the spring 89 (Figure 1). The swinging stops 62 will continue to swing but plate 78 and associated parts will not swing back to their former position because the spring 89 keeps the rod 80 and extension 82 elevated. When it is desired to fix a broken thread, the operator places his foot on the foot pedal 90 (Figure 1) and in this manner moves the rod 80 and associated parts downwardly against the action of the spring 89. The thread is then repaired and as the extension 86 is resting on the horizontal surface 87, rod 80 cannot move upwardly again until the same thread or another thread from the same group breaks, whereupon the same action will take place. This action naturally will take place when any of the threads 66 in a particular group breaks, and, consequently, the spindles 23 associated therewith will stop, though the remaining spindles and other parts of the machine will continue to function. The same action would take place in case the spools 91 should become empty. It will be noted that the spools 91 are mounted on suitable spindles carried by frame 92. In the drawings only two spools 91 have been shown, but it is evident that one could be used, or as many as there are guiding eyes 68 in the stop motion mechanism 67.

It will be understood that the mechanism just described is provided on each side of the machine because there are two rows of spindles 23. However, each of the stop motion mechanisms operates independently but all coact with the rock shaft 59 and one swinging stop 62 acts for two stop motions, namely, one on each side of the machine.

When the vertical rod 80 moves upwardly as above described, the spindle 23 associated therewith will stop. In Figure 4 a detail structure of the lower part of the spindle 23 and associated parts is shown. All the other spindles and associated parts are made identical. Therefore, the description of this one will apply to all. Referring more particularly to Figure 4, it will be seen that the rod 80 is pinned or otherwise rigidly secured to the bracket 93, and also pinned or otherwise rigidly secured to a bar 94, which in turn is pinned or otherwise rigidly secured to the rod 95, having one end sliding in an aperture 96, so as to be guided thereby, the opposite end extending through the bottom plate 97 (Figure 1). The rod 95 carries a stop 98 against which spring 89 presses, said spring also pressing against the plate 97 and continually gives the rod 98 a tendency to move upwardly, and, consequently, gives the vertical rod 80 a continuous tendency to move upwardly, but said upward movement is prevented by the extension 68 (Figure 7) resting on the surface 87 of extension 82. The spindle 23 is constructed in the usual manner of a spindle, namely, in a slightly tapering formation so that the respective spools 99 may be dropped thereon, and by a slight pressure held thereon through the action of friction. At the lower end the spool 99 is provided with an annular shoulder 100 which limits the downward movement of the spool in case the spool should go that far down. Two or more pins 101 preferably extend from the lower end of the spool into suitable notches or openings 102 in what might be termed a guiding block 103. This block has a central aperture into which the spindle extension or rod 104 extends, said rod being rigidly secured by pin 105 or otherwise to block 103 so that the rod and block rotate together. The block 103 is provided with a friction surface 106 adapted to be engaged by the leather or other contact surface 107 carried in the socket 108 of the bracket 93. It will thus be seen that when the rod 80 is moved upwardly by the spring 89, the arm 93 will be moved upwardly and will move the block 103 and the rod 104 upwardly. In addition the friction member 107 will act frictionally on the block 103 and substantially instantly stop the rotation of the block, the spindle 23, and the spool carried thereby. It will thus be seen that substantially instantly upon the breaking of a thread the spool receiving the thread will be stopped. Rod 104 extends downwardly and is journaled in a sleeve 109, said sleeve being secured by friction or otherwise to a tubular portion 110 of bracket 111, which bracket has a tubular portion 112 at the upper end, said upper end being rigidly secured by friction or otherwise to a plate 113. The plate 113 forms part of the cover of the box 19, there being other plates associated with each spindle to complete the cover structure. An oil opening 114 is provided in the tubular portion 112 and partly in the journaled sleeve 115, which is preferably held in the tubular portion 112 by friction, though it might be secured in some other manner.

It will thus be seen that the rod 104 is journaled near each end and near where it merges into spindle 23 is rigidly secured to the block 103, and at about the center, it rigidly secured to the cone 116 by a suitable pin. Cone 116 coacts with the cone surface 117 on the sleeve 118, which sleeve is rigidly secured to the pinion 24, which pinion continually meshes with the gear wheel 21. The cone 116 and the cone socket 117 are so formed that only a slight weight is necessary to secure ample friction or connection to cause the pinion 24 to drive the cone, shaft 104 and spindle 23 with its spool. However, the spring 89 has ample power to quickly raise the rod 80 when permitted and to also quickly raise the block 103, the shaft or rod 104, and cone 116, thus producing not only a disconnection of the power but a braking action through the friction surface 107. As soon as the rod 80 is permitted to drop down, or is forced down, by the operator, it will move away from the block 103, and this block, spindle 23, and rod 104 will drop down, and the weight of these parts is sufficient to cause the cone 116 to secure ample frictional engagement to the cone socket 118 to cause an instant driving action, provided the machine is functioning.

As a single thread, or two or more threads, are placed in operative position, they are given several turns around the tension and guiding rollers 119 and 120, as illustrated in Figures 8 to 11 inclusive. In order to prevent the threads from becoming tangled, and also to cause a proper feeding action, rollers 119 and 120 are arranged at certain angles in respect to each other. The roller 119 is preferably substantially parallel to the rod 121, which is also substantially parallel to the boxes 19 and 20 and rod 59. However, the roller 120 is inclined downwardly and also horizontally toward the roller 119, as illustrated particularly in Figures 9 and 11. This arrangement of roller 120 permits the threads to stay separated as they pass around the roller from the respective eyes 68 to the traveller 122. The traveller 122, as shown in Figure 1, is the usual traveller and is carried by the transfer bar 123, as shown

in Figure 3, the bar 123 being accentuated by the rod 124, hereinafter fully described, and carrying a traveller on each side of the machine so as to coact with two spindles 23. The traveller moves upwardly and downwardly at a certain ratio, as hereinafter fully described, to wind the twisted or doubled and twisted thread on the spools 99. The rod 121 is connected rigidly to the gear 125 forming part of the train of gears 38, shown in Figure 2, so that this rod operates at a speed in proportion to the speed of the other parts of the machine. As shown in Figure 11, the rod 121 carries a gear wheel 126 which continually meshes with the gear wheels 127 and 128. The teeth of these gear wheels are sufficiently large and loose in their meshing action to permit a ready mesh of gear 128 with gear 126, notwithstanding the fact that they are at an angle. A casing 129 is provided, the same having a bracket 130, which is rigidly secured to the rod 80 by any suitable means, as, for instance, by a set screw 131. The casing 129 is provided with tubular portions 132 and 133 which carry bearing sleeves 134 and 135. Shafts 136 and 137 are rigidly secured to their respective gears 127 and 128, and also, to the rollers 119 and 120, which rollers telescope over the tubular portions 132 and 133, but preferably do not contact therewith. It will thus be seen that the rollers 119 and 120 are positively driven when the machine is operating and when the vertical rod 80 is in its proper operative position. The rollers 119 and 120 feed the thread at a certain rate of speed, and the spindle 23 operates also at a certain speed, while the bars 121 operate at a certain speed, thus permitting a desired doubling and twisting, or merely twisting where there is only one thread involved. It will be noted that there are only a few bars 123 shown, but, if desired, any desired number could be used and connected by the longitudinal plates 123' and 123''. The respective bars 123 are rigidly secured to the shafts 124, and these shafts rest on the outer end of the respective levers 136, which levers have pins 137 journaled in a suitable bearing 138. Each lever is provided with a weight 139 which normally keeps the end of the lever in contact with the lower ends of the respective rods 124. An arm 140 is rigidly secured to each lever 136, said arm being pivotally connected with a pull and push rod 141, which pull and push rod is pivotally connected to one end of the bell crank lever 142, which lever has a free end continually operating on the heart-shaped cam 143. This cam is actuated by a worm gear 144 which continually meshes with the worm 145 and this worm is rigidly secured to a shaft carrying a sprocket wheel 146. A chain 147 is fitted on the sprocket wheel 146 and on to a sprocket wheel 148 rigidly secured to the rod or shaft 121. In this way power is transmitted by the shaft or rod 121 to the driving and tension rollers 119 and 120, and also to the mechanism for raising and lowering the respective travellers 122. These parts are preferably lowered by gravity, though if desired, spring means could be added to give a positive downward movement.

In operation the machine is intended to function a long period of time without stopping. However, any particular spindle and associated mechanism may be individually stopped at any time to replace or repair a thread, or for any other reason. When first starting the machine the hand wheel 50 is actuated to disconnect the gear wheel 39 from the cone clutch 53, so that the shaft 59 will not function, but will remain stationary, and the swinging abutment 63 will remain stationary, hanging in a vertical position. As the machine begins to move the rollers 119 and 120 will pull on the threads and feed the same to the travellers 122. As the rollers thus put tension on the threads, the various eyes 68 and associated parts will move outwardly to their operative positions as shown in Figure 7, so that the extension 86 of the plate 78 cannot move off of the surface 87. After the parts have been thus automatically brought into position, the hand wheel 50 is actuated to permit the cone clutch 53 to function, whereupon the shaft 59 will begin to rock so as to actuate the stop motion mechanism 67 in case one or more threads break. The reason that it is necessary to maintain the shaft 59 stationary when starting the machine is to prevent breaking of some of the threads. After the parts have been started, as just described, the tension and feed rollers 119 and 120 will pull on the threads to feed the threads to the spools 99 at the proper speed. While this is taking place the shafts 16 and 17 are rotating, and, consequently, the various gear wheels 21 are rotating, and are thereby rotating the pinions 24 so that the various cones 116, as shown in Figure 4, are rotated, thus driving the spindles 23 at the desired speed. While this is taken place, the rod or shaft 121 is rotating and power is being transmitted to the heart-shaped cam 143, and from thence to the other mechanism for raising and lowering the travellers 122. Also, simultaneously with these actions, the pump 29 is functioning to draw oil from the box 22 and force the same through the various oil feeding pipes to the various gears. If the machine is functioning one hundred per cent no attention need to be paid thereto, as all the parts operate automatically after the machine has once been started. However, if for any reason one of the threads should break, the stop motion mechanism 67 carrying that particular thread will function and the spindle 23 associated therewith will stop. As the shaft 80 is raised by the spring 89 to disconnect the cone 116 from its socket, the gear wheels 127 and 128 (Figure 11) will be lifted off of the gear wheel 126 so that the particular feed rolls 119 and 120 will stop rotating, though the shaft 121 will continue to rotate so as to actuate the other tension and feed rolls. In case the ratio of movement of the shaft 121, and the movement of the travellers 122 upwardly and downwardly is to be changed, the sprocket wheels 146 and 148 are removed and different sized sprocket wheels substituted so that there will be a different ratio of drive, though the same chain 147 may be used. In this way the speed of the feed of the thread may be increased or decreased in proportion to the upward and downward movement of the respective travellers 122. It will be noted that the spindles are gear driven and that all belts have been eliminated and various direct driving mechanisms used so that all the parts will function in a positive manner.

I claim:

1. A doubling and twisting machine including a frame, a plurality of spindles carried thereby, driving mechanism for driving said spindles, said driving mechanism including a plurality of gears for each spindle and an oiling system for oiling said gears, said oiling system including a continuously functioning pump, a system of pipes for distributing the oil from the pump to the gears near their point of meshing, a system of pipes for withdrawing the oil adjacent the gears, and

a filter for filtering the oil immediately before it is forced into the distributing system.

2. A doubling and twisting machine including a frame, spool receiving spindles, means for driving said spindles and a stop motion mechanism for each spindle for stopping the driving thereof, said stop motion mechanism including an eye for guiding the thread, a pivotally mounted member carrying said eye and balanced to swing away from a predetermined position when the thread passing through the eye is broken, a rod acting as means to connect the spindle with the power driving means, a spring acting to normally raise said rod when in operative position, a swinging plate acting to normally hold the rod in an operative position, a pivotally mounted member carried by said swinging plate, a swinging lever acting on said pivotally mounted member to swing the same into a given position when a thread breaks, and a rockable member positioned to engage the pivotally mounted member and push the pivotally mounted member and the plate to a position for releasing said rod, whereby said spring will function to disengage the power from said spindle.

3. A doubling and twisting machine including a frame, a spindle adapted to receive a spool, driving means for driving said spindle, a clutch for connecting the spindle with the driving means, a spring pressed rod for moving the clutch to an inoperative position, a stop motion mechanism for releasing the rod so that the spring may function, said stop motion mechanism including a rock shaft, means for connecting the rock shaft with said driving power means, the last said connecting means including a swinging arm having a strap at one end, an eccentric arranged in said strap, a cone clutch rigidly secured to said eccentric, a gear wheel having a socket to receive said cone clutch, and manually operated means for moving said gear wheel into and out of engagement with said clutch.

4. In a doubling and twisting machine, a stop motion rock shaft, an arm rigidly secured to said rock shaft, a reciprocating member connected to said arm for rocking the arm and the rock shaft, said arm having a strap at one end, a disc arranged within said strap provided with an eccentrically positioned aperture, a cone clutch having a hub extending into said aperture, said hub being rigidly secured to said disc, a power transmitting member having a cone socket, the wheels of which are adapted to be engaged to said cone clutch, said power transmitting member having a projecting neck provided with an annular enlargement, a stationary shaft extending through said cone clutch and said neck, a fork member straddling said neck and provided with inwardly extending bearing members coacting with said enlargement, a spring for acting on said fork member and said neck for forcing the power transmitting member into engagement with said clutch, and manually actuated threaded means for pulling said bifurcated member and using said shaft as a fulcrum whereby said power transmitting means will be pulled away from said cone clutch.

5. A doubling and twisting machine including a frame, a pair of boxes extending longitudinally of the frame, driving means extending substantially from one end of each box to the other, said driving means including a shaft for each box and a plurality of pairs of gears connected with each shaft, a spindle for each pair of gears, means for disengagingly connecting the respective spindles with the respective pairs of gears, an oil distributing pipe extending longitudinally of each of said boxes, each of said pipes having a plurality of discharge nozzles, having one nozzle for each pair of gears, an oil reservoir, means for directing oil from the bottom of said boxes to the said reservoir, a pump for taking oil from the reservoir and discharging the same through said distributing pipes, said pump being geared to one of said driving shafts whereby oil will be fed continuously and automatically as long as the driving shaft functions.

6. A doubling and twisting machine including a frame, a plurality of spindles, each spindle being adapted to receive a spool, means for driving said spindles and means for feeding the thread to the spools on the spindles, each of the last mentioned means including a pair of driving and tensioning rollers, each roller being tubular fully open at one end and partly closed at the opposite end, a drive shaft for each roller rigidly secured to said opposite end, a journaled sleeve carrying each of said drive shafts, a casing provided with a tubular extension frictionally receiving the respective journaled sleeves, a gear rigidly secured to each of said drive shafts, said gear being arranged within said casing and a constantly driven gear adapted to mesh simultaneously with both of the first mentioned gears, and means for raising said casing, first mentioned gears and associated parts whereby the first mentioned gears will be out of mesh with the last mentioned gears.

7. A doubling and twisting machine including a frame, a pair of trough-like boxes extending from one end of the frame to the other, a row of spindles carried by each box, a longitudinally positioned drive shaft positioned principally within each box and extending longitudinally thereof from one end to the other, a driving gear operatively connected with said drive shaft for each spindle, a driven gear meshing continually with said driving gear for each spindle, a friction clutch for each driven gear for connecting the respective driven gears with the respective spindles, and means for providing a circulation of oil for lubricating said gears, said means withdrawing the oil from the bottom of said trough-like boxes and discharging the oil at a higher point on said gears, said means including a drain pipe for each box extending through the bottom of the boxes, a distributing pipe arranged above said gears and positioned to direct oil to the top portion of the respective gears, and a pump positioned between the drain pipe and the distributing pipe for directing the oil drained from the bottom of the boxes into said distributing pipe and forcing the oil on to the gears.

8. A doubling and twisting machine including a frame, a spool carrying spindle, means for driving said spool carrying spindle, a clutch connecting and disconnecting the spindle from the driving means, means including a spring actuating rod for moving the clutch to a disconnected position, and a stop motion mechanism coacting with said rod normally acting to hold the rod in an operative position against the actuation of said spring, said stop motion mechanism including a swingable plate, an abutment extending from said rod, a cam carried by said swingable plate positioned to press against said abutment whereby the rod is held against actuation by said spring, a bracket, a control lever swingably mounted on said swingable plate, said control lever having an extension, a bell crank lever pivotally mounted on said bracket, a thread rod connected at one end

to one of the arms of said bell crank lever, a thread carrying eye carried by said thread rod, said bell crank lever being positioned so that one of the arms is adapted to engage one end of said control lever for swinging the control lever to a predetermined position when said thread breaks, and an oscillating member positioned to strike said extension when swung by said bell crank lever, said oscillating member shifting the position of said control lever and said extension carried thereby sufficiently to move said cam out of contact with said abutment, whereby said spring may function to raise said rod and thereby move said clutch to an inoperative position.

9. A doubling and twisting machine including a frame, a spool carrying spindle, driving means and a clutch member for connecting and disconnecting the spindle with the driving means, a spring actuated rod for holding said clutch in an inoperative position, a stop rigidly secured to said rod, and a stop motion mechanism normally holding the clutch in an operative position, said stop motion mechanism including a constantly moving rock shaft, an oscillating member carried by said rock shaft, a swingable member having an extension positioned to normally engage said stop on said rod for maintaining the clutch in operative position, a swinging lever having an eye through which the thread is adapted to pass, and a pivotally mounted lever actuated by said swinging lever, said pivotally mounted lever having an extension adapted to move in the path of movement of said oscillating member, whereby the pivotally mounted lever and said extension will be moved out of engagement with said stop so that said rod may function for moving said clutch to an inoperative position.

10. A doubling and twisting machine including a frame, a spindle provided with an integral extension, a block removably connected with said spindle extension, and acting to support the spindle, said block having an annular depending flange, power actuated means to rotate the block, said power actuated means including a cone clutch rigidly secured to said spindle extension, means extending beneath said block for raising said rod and cone clutch for disconnecting the same from the power driving means, said means extending beneath said block being formed with an annular socket larger than and in substantial alignment with said annular depending flange on said block, a resilient friction member positioned in said socket so as to engage said flange and presenting a friction surface to said flange whereby the parts will act as a brake to stop the rotation of the block and spindle as soon as the cone clutch has been disengaged and a vertically movable rod connected to said means for raising the spindle for causing said brake means to function.

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