June 1, 1926. 1,587,093

A. VAN VEEN

STOPPING MECHANISM FOR WIRE TWISTING MACHINES

Filed July 23, 1923 3 Sheets-Sheet 1

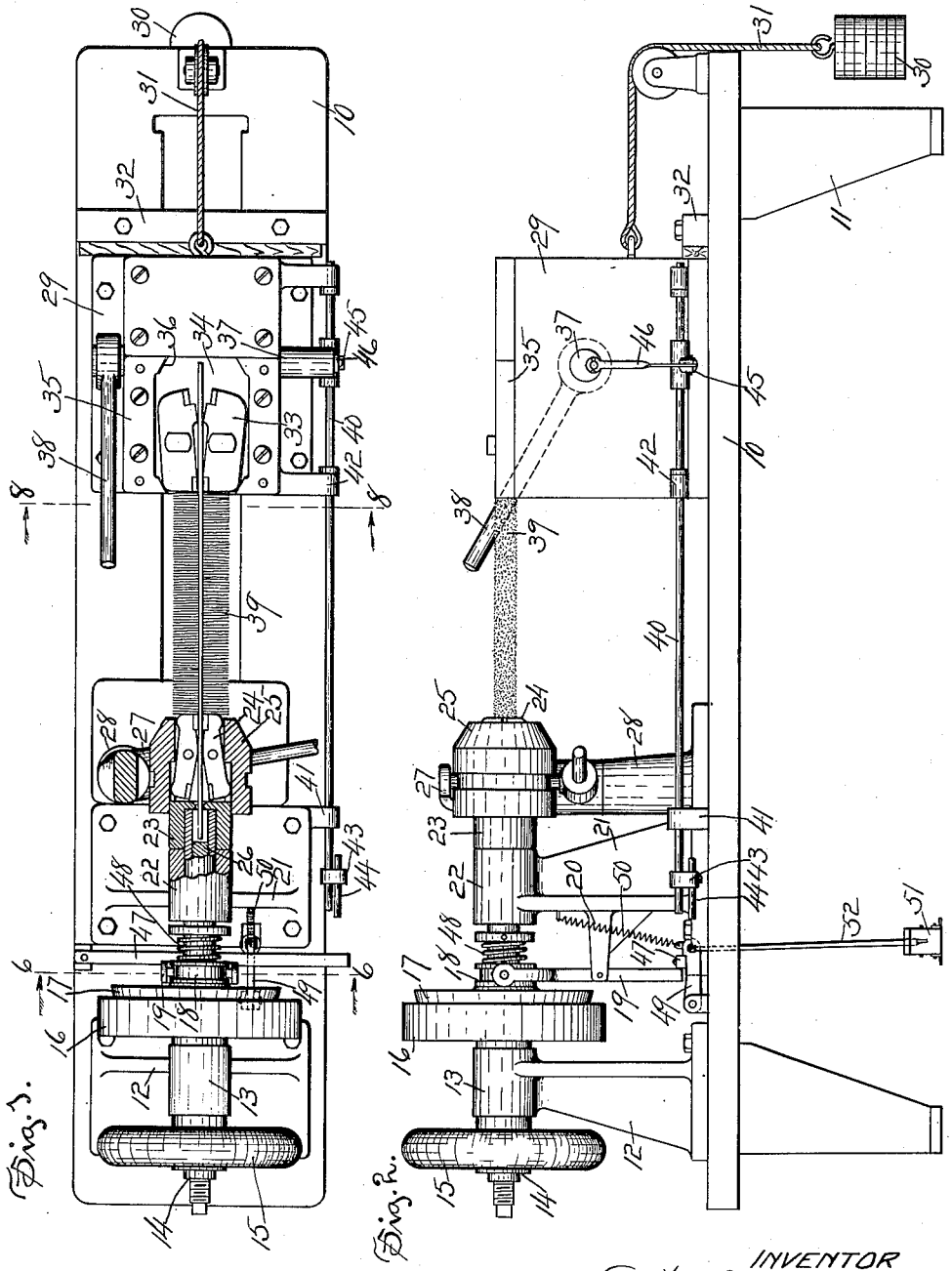


Fig. 1.

Fig. 2.

INVENTOR
Anton Van Veen
By
Arthur B. Jenkins
ATTORNEY

June 1, 1926. 1,587,093

A. VAN VEEN

STOPPING MECHANISM FOR WIRE TWISTING MACHINES

Filed July 23, 1923 3 Sheets-Sheet 2

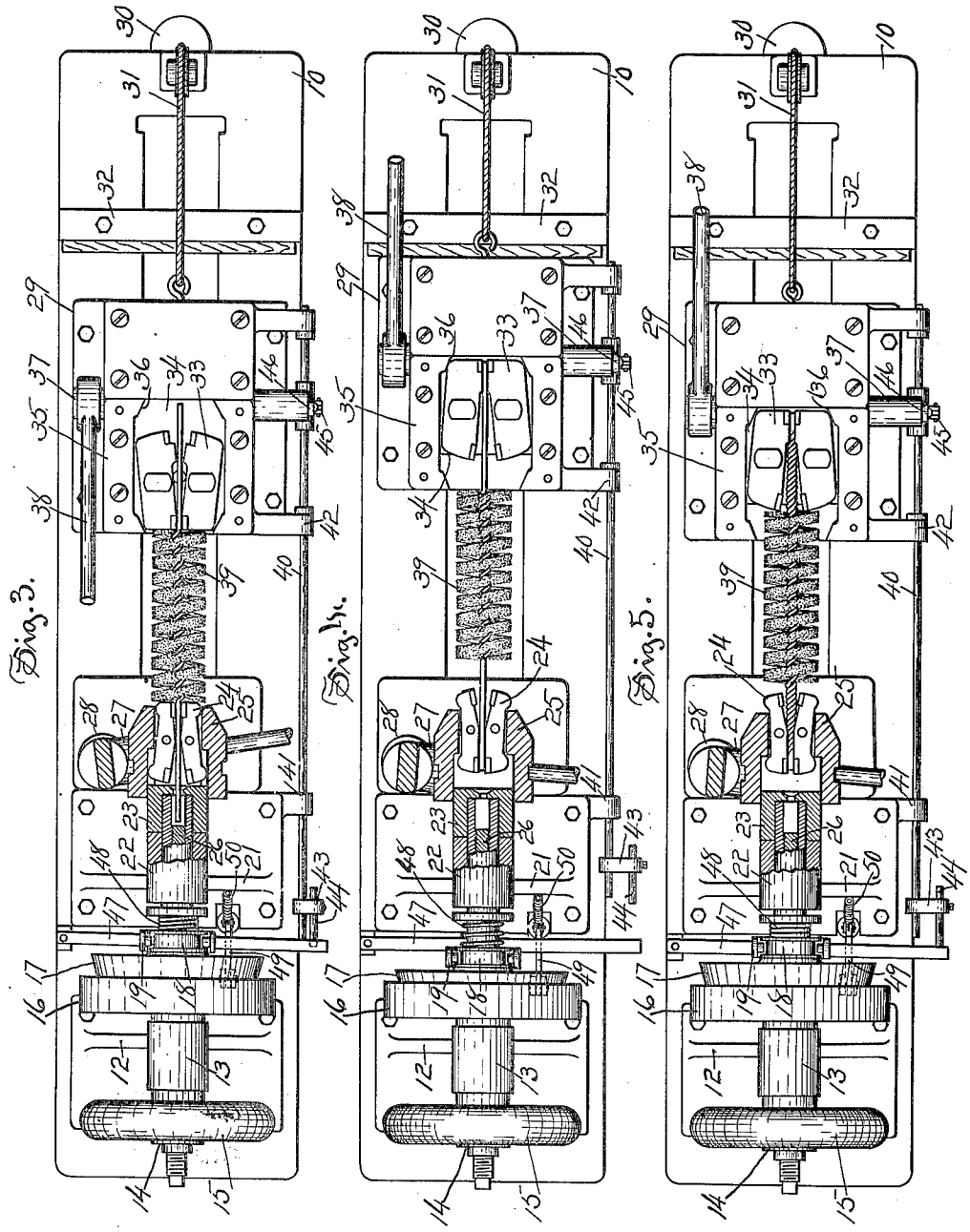


Fig. 3.

Fig. 4.

Fig. 5.

INVENTOR
Anton Van Veen
by
Arthur B. Jenkins,
ATTORNEY

June 1, 1926. 1,587,093

A. VAN VEEN

STOPPING MECHANISM FOR WIRE TWISTING MACHINES

Filed July 23, 1923 3 Sheets-Sheet 3

Fig. 6.

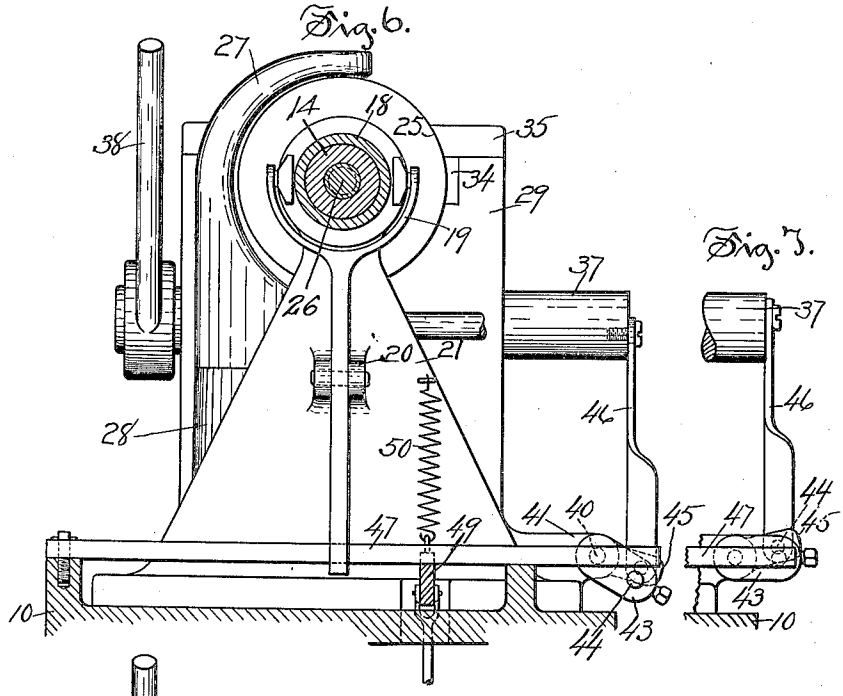
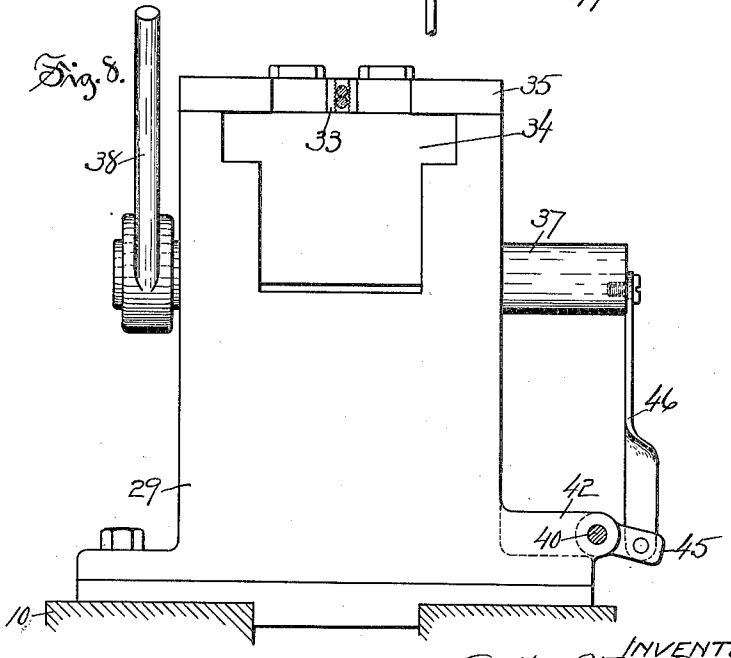


Fig. 7.

Fig. 8.



INVENTOR
Anton Van Veen.
by
Arthur B. Jenkins,
ATTORNEY

Patented June 1, 1926. 1,587,093

UNITED STATES PATENT OFFICE.

ANTON VAN VEEN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE FULLER BRUSH COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

STOPPING MECHANISM FOR WIRE-TWISTING MACHINES.

Application filed July 23, 1923. Serial No. 653,130.

This invention relates to the class of devices employed for stopping the operation of mechanism more especially as applied to wire twisting machines, and an object of the invention, among others, is to provide a device of this class that shall effectively stop the operation of the machine during the various steps in a single twisting operation and under various conditions.

One form of machine embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a top view of a machine embodying my invention with parts broken away to show construction.

Figure 2 is a view in rear elevation of the same.

Figure 3 is a view similar to Figure 1, but showing the position of the parts after the termination of the twisting of the body portion of the brush.

Figure 4 is a view similar to Figure 3, but illustrating the position of the parts after the clutches have been released following the operation shown in Figure 3, and just prior to the final twisting operation.

Figure 5 is a view similar to Figure 4, but illustrating the mechanism shown at the completion of the final twisting operation.

Figure 6 is a view, scale enlarged, in vertical section on a plane denoted by the dotted line 6—6 of Figure 1.

Figure 7 is a detail view illustrating the stopping mechanism in its final stopping position.

Figure 8 is a view similar to Figure 6, on a plane denoted by the dotted line 8—8 of Figure 1.

In the accompanying drawings the numeral 10 indicates the table of my improved machine that may be supported in any ordinary manner as upon legs 11, the whole being constructed of any suitable material and in any desired form. A standard 12 rises from the table near one end thereof and supports a clutch bearing 13 in which a spindle 14 is rotatably mounted, and that may be manually operated as by means of a hand wheel 15. A pulley 16 or other driving element is loosely mounted on said spindle and, in the construction herein shown, this pulley forms one element of a clutch, the shifting member 17 of which is splined to the spindle. A grooved disc 18 is integral with the clutch member 17 and has a groove to receive projections from the forked end of a clutch shifting lever 19 pivotally mounted on a bracket 20 extending from the side of a standard 21 rising from the base of the machine and supporting a chuck bearing 22 at its upper end. A chuck body 23 is secured to the spindle 14 and is provided with chuck jaws 24 and a sliding jaw actuating sleeve 25 by means of which the jaws 24 are opened and closed. A stop 26, in the form of a rod, projects through the spindle 14 in position to receive the ends of the wires to be twisted and thus properly position them within the chuck jaws. An actuating yoke 27 is pivotally mounted on a support 28 rising from the table 10, said yoke having a handle as a means for operating it.

A tail stock comprises a tail block 29 mounted for reciprocating sliding movement on the bed 10, a weight 30 connected by a flexible support 31 with the block 29 holding it in its retracted position as against a stop 32.

A tail chuck carried by the block 29 comprises a pair of chuck jaws 33 pivotally mounted on a chuck actuating slide 34 mounted in a slideway at the upper part of the block, said slideway being constituted, as to one side, of plates 35, the edges of which overlie the edges of the slide 34 to retain it in place. The plates 35 have chuck jaw actuators 36 located at opposite ends of each plate, these actuators comprising beveled surfaces adapted to engage opposite ends of the chuck jaws, as illustrated in Figures 1 and 5 of the drawings, when said jaws are carried against the actuators by the movement of the slide 34. Each of the jaws 33 is provided at its opposite ends with grips for holding the ends of wires to be twisted. The slide 34 is reciprocated to actuate the jaws by means of any suitable connection with a shaft 37 that extends through the tail block 29, said shaft being provided with an actuating handle 38 as a means for rotating it to reciprocate said slide.

Many of the features of the machine thus far described comprise elements illustrated and described in my patent issued to me on the 27th day of February, 1923, No. 1,446,-

599, my improved stopping mechanism herein illustrated and described being readily adapted to the machine forming the subject matter of said patent.

In the operation of the machine illustrated herein, when the parts are in their normal positions of rest, the front or inner ends of the jaws 24 and 33, that is the ends of the jaws nearest the lengthwise center of the machine, are separated enough to receive a number of wires, preferably two, which wires are all cut to a certain length, and to properly operate upon which the tail stock and spindle are "set" one with respect to the other. These wires are inserted between the jaws 24, and the handle of the yoke 27 is operated to swing said yoke to move the sleeve 25 to actuate the jaws 24 and close them at their front or inner ends to grasp the wires. The opposite ends of the wires are inserted between the jaws on the tail stock, these ends of the wires being located a short distance only from the back end of the recess in the tail block 29 and in which the jaws are located, and as shown in Figure 1 of the drawings. The upper wire is now raised sufficiently to permit material, as bristles 39, to be inserted and evenly distributed between the wires and up to a point in proximity to each pair of chuck jaws. The top wire is now inserted between the jaws in the tail stock and into contact with the other wire and the actuating handle 38 is moved to shift the slide 34 and thereby close the front ends of the jaws 33 against the wires to secure them. In this position of the parts the block 29 rests against the stop 32 and the spindle 14 is operated to rotate the chuck thereon and impart the proper twist to that portion of the wires between the two sets of chuck jaws. In its twisting operation the wire will be shortened by reason of the twist given to it, and this will cause the block 29 to be drawn toward the live chuck, and as shown in Figure 3 of the drawings, the weight 30 permitting such movement. The handle of the yoke 27 is now operated to release the chuck jaws 24 and thereupon the weight 30 will move the block 29 backwardly against the stop 32, drawing the ends of the wires in the live chuck outwardly until said ends are practically just within the outer or rear ends of the chuck jaws, and as shown in Figure 4 of the drawings. The handle of the yoke 27 is now operated to close the back or outer ends of the jaws 24 upon the wires and the handle 38 is operated to release the jaws at the opposite end of the machine by moving the slide 34 backwardly toward the end of the machine, thereby locating the ends of the wires flush with the rear ends of the jaws and moving said jaws into contact with the chuck jaw actuator to close the rear ends of the jaws upon the wires, and the spindle operating the chuck now being rotated as before the ends of the wires outside the earlier twisted portions will be twisted, as illustrated in Figure 5 of the drawings, the operation being now completed and the chuck jaws being loosened and the twisted article removed.

My invention contemplates the automatic stopping of the twisting mechanism at the completion of each of these twisting operations, and to this end I provide a stopping mechanism to act upon the shifting lever 19 of the clutch. This stopping mechanism comprises a clutch actuating rod 40 mounted in guides 41—42 secured to the table 10 and the tail block 29, this rod having a support 43 for a stop finger 44 secured to said support. A crank arm 45 is secured to and extends from the rod 40, said crank arm being connected by a stop actuating strap 46 with the shaft 37, said strap being eccentrically attached to the end of said shaft so that as said shaft is moved in opposite directions, as by the handle 38, the rod 40 will have an oscillating movement imparted to it. A clutch actuating lever 47 is pivotally mounted at one edge of the table 10 and extends across the table in front of the lever 19, this being on that side of the lever toward the center of the machine. This lever is positioned to be in the path of movement of the end of the clutch actuating rod 40, and also in the path of movement of the stop actuating finger 44 when the latter is in one position. The clutch member 17 is forced normally into engagement with the clutch member 16 by a spring 48, and a clutch holding latch 49 is provided to hold the clutch members separated at certain times. This latch is pivotally mounted on the table 10 underlying the actuating lever 47 and is forced by a latch spring 50 toward said lever. When the lever 47 is moved to a position to cause the clutch parts to separate it is engaged by said latch and thereby held to retain the clutch members in their separated condition. A foot treadle 51 is connected by a rod 52 with said latch and is used as a means for disconnecting the latch from the lever 47 to permit engagement of the clutch parts when desired.

In the operation of this stop mechanism when a wire and brush material have been placed within the chuck jaws, as hereinbefore described, preparatory to a twisting operation, the wires to be twisted will be grasped by the front ends of the chuck jaws on opposite sides of the brush material, and as illustrated in Figure 1 of the drawings. At this time the handle 38 will be in the position shown in Figure 1, this position being necessary in order to close the front ends of the jaws against the wire. In this position of the parts the actuating rod 40, as hereinbefore stated, will be in line with the clutch

actuating lever 47, or rather said lever will be in the path of movement of said rod. The operation of the machine is now effected to secure the preliminary twisting as hereinbefore described, during which the tail stock is moved toward the live spindle, owing to the shortening of the wire in the twisting operation, this movement of the tail stock carrying with it the actuating rod 40 which, striking the clutch actuating lever 47, will move it to operate the clutch shifting lever 19 to disengage the clutch parts and thus stop the operation of the machine. In this operation the finger 44 will pass underneath the lever 47 as illustrated in dotted lines in Figure 3. When the lever 47 has been pushed to this position the latch 49 will engage said lever and thus prevent reengagement of the clutch parts under the influence of the spring 48.

When this preliminary twisting to secure the material 39 has taken place and the clutch parts are held disengaged, the jaws 24 are released as hereinbefore described and the weight 30 will move the tail chuck backwardly so that the wires will be located, as to the twisting chuck, as illustrated in Figure 4 of the drawings. The handle 38 will now be swung to the position shown in said Figure 4 to move the slide 34 backwardly and in this operation the turning of the shaft 37 and the eccentric connection by the strap 46 with the cam arm 45 will rotate the actuating rod to the position shown in Figure 7, thus locating the finger 44 in line with the clutch actuating lever 47. The wires to be twisted will, in this operation, have been located flush with the outer ends of the tail chuck jaws, and as shown in Figure 4. When the machine is again started, as by pressing down on the foot treadle 51 to permit engagement of the clutch members, the ends of the wires outside of the brush material will be twisted, and in this twisting operation the tail block will again be moved toward the twisting chuck. In this movement the finger 44 will engage the lever 47 and separate the clutch members, as hereinbefore described, the lever 47 being again engaged by the latch 49 and held to prevent engagement of the clutch members. The twisted brush may now be removed and the operation may be repeated.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the machine which I now consider to represent the best embodiment thereof; but I desire to have it understood that the machine shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim:—

1. A wire twisting machine comprising mechanisms for holding opposite ends of the wires to be twisted, one of said mechanisms being secured to the wire and thereby moved in the direction of shortening of the wires during the twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, and a member positioned to be operated by said movable mechanism to control an operation of said starting and stopping mechanism.

2. A wire twisting machine comprising mechanisms for holding opposite ends of the wires to be twisted, one of said mechanisms being secured to the wire and thereby moved in the direction of shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, and a member carried on said movable mechanism to control an operation of said starting and stopping mechanism.

3. A wire twisting machine comprising mechanisms for holding opposite ends of the wires to be twisted, one of said mechanisms being secured to the wire and thereby moved in the direction of shortening of the wires during a twisting operation and the other of said mechanisms operating to twist said wires, means to control the starting and stopping of said twisting mechanism, and a member positioned to be operated by said movable mechanism to control an operation of said starting and stopping mechanism.

4. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being secured to the wire and thereby moved in the direction of shortening of the wires during a twisting operation and the said mechanisms operating to twist said wires, means to control the starting and stopping of said twisting mechanism, and a member carried by said movable mechanism to control an operation of said starting and stopping mechanism.

5. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being secured to the wire and thereby moved in the direction of shortening of wires during a twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, and a rod supported in guides and connected with said movable mechanism to be operated thereby to control an operation of said starting and stopping mechanism.

6. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being secured to the wire and thereby moved in the direction of shortening of the wires

during a twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a lever for operating said starting and stopping mechanism, and a member operatively connected with said movable mechanism and moved thereby to engage said lever to actuate it.

7. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, a clutch to control the operations of said twisting mechanism, a lever to operate said clutch, and a member operatively connected with said movable mechanism and moved thereby to actuate said clutch lever.

8. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, means for retaining said starting and stopping mechanism in a predetermined position when operated to that position, and means operatively connected with said movable mechanism to actuate said starting and stopping mechanism.

9. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, a clutch for controlling the operation of said twisting mechanism, means for holding the clutch members in one position when moved to that position, and means operatively connected with said movable mechanism to actuate said clutch.

10. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, and including a clutch having its members engaged to effect said twisting operation, means for holding the clutch members disengaged, and means operatively connected with said movable mechanism to cause actuation of said clutch.

11. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, means for retaining said starting and stopping mechanism in a predetermined position when operated to that position, means for releasing said wires from the holding means during the retention of said starting and stopping mechanism in said position, and a member positioned to be operated by said movable mechanism to control the operations of said starting and stopping mechanism.

12. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, a clutch to operate said twisting mechanism, means for retaining the clutch members relatively in one position, means for releasing the wires from the holding means to permit movement of said movable mechanism, and a member positioned to be operated by said movable mechanism to control the operations of said clutch members.

13. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, a clutch to operate said twisting mechanism, means for forcing the clutch members into engagement, means for retaining said members disengaged, means for releasing said wires to permit movement of the movable wire holding mechanism, and a member positioned to be operated by said movable mechanism to control the operations of said clutch members.

14. An actuating mechanism, means for changing the position of said actuating mechanism, a working mechanism, means for starting and stopping said working mechanism, a stop motion member operatively connected with said actuating mechanism, and means to effect operation of said stop motion member to control operations of said working mechanism in either position of said actuating mechanism.

15. An actuating mechanism, means for changing the position of said actuating mechanism, a working mechanism, means for starting and stopping said working mechanism, a stop motion member operatively connected with said actuating mechanism, and means to effect operation of said stop motion member to control operations of said working mechanism in the successive changed positions of said actuating mechanism.

16. An actuating mechanism and a working mechanism, said mechanisms being relatively movable to different positions during

successive operations, means for starting and stopping said working mechanism, a stop motion member operatively connected with one of the other of said mechanisms for operation thereby and with said mechanisms for operation thereof, and means to effect operation of said stop motion member to control operations of said other mechanism in the different relative positions of said mechanisms.

17. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, means for changing the relative positions of said mechanisms in successive twisting operations on the same structure, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a stop motion member, and means to position said stop motion member to control operations of said twisting member in either of the changed relative positions of said mechanisms.

18. A wise twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being movable to different positions in succeeding twisting operations on the same structure, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a stop motion member, and means to position said stop motion member to control operations of said twisting member in either position of said mechanism.

19. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, means for changing the relative positions of said mechanisms in successive twisting operations on the same structure, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a stop motion member, means for changing the position of the operating end of said stop motion member to control operations of said twisting member in either of said relatively changed positions, and means for operating said stop motion member.

20. A wire twisting machine comprising mechanisms to hold opposite ends of wires to be twisted, means for changing the relative positions of said mechanisms in successive twisting operations on the same structure, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a member for releasing said wires, a stop motion member, and a connection between said releasing member and said stop motion member to position the latter to control operations of said twisting member in either of the relative positions of said mechanisms.

21. An actuating mechanism, means for changing the position of said actuating mechanism, a working mechanism, means for starting and stopping said working mechanism, a stop motion member operatively connected with said actuating mechanism and rotatably mounted to present different portions lengthwise thereof for stopping action, means for rotating said stop motion member, and means for actuating it for stopping purposes.

22. An actuating mechanism, means for changing the position of said actuating mechanism, working mechanism, means for starting and stopping said working mechanism, a stop motion member having two ends and operatively connected with said actuating mechanism, means for rotating said stop motion member to present its different ends for stopping purposes, and means for otherwise operating said stop motion member.

23. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of wires during a twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of the twisting mechanism, a stop motion member rotatably mounted, a member to loosen said wires from the holding mechanism, said member being operatively connected with said stop motion member to rotate it to present different portions to said starting and stopping mechanism, and means for otherwise operating said stop motion member.

24. A wire twisting machine comprising a twisting chuck, a holding chuck slidably mounted to permit shortening of wires in the twisting operation, clutch mechanism to control operations of the twisting chuck, a member for loosening the holding chuck, a stop motion rod rotatably mounted to operate said clutch mechanism, and a connection between the member for loosening the holding chuck and said rod to rotate the rod to present different portions thereof to said clutch to operate it.

25. A wire twisting machine comprising a twisting chuck, a holding chuck slidably mounted to permit shortening of wires in the twisting operation, manually operated means for loosening the holding chuck jaws, a stop motion member rotatably mounted to present different parts for stop motion action, a connection between said manually operated means and said stop motion to rotate the latter, a clutch to control operations of the twisting chuck, and a clutch actuating member positioned in the path of movement of the different parts of said stop motion member.

26. An actuating mechanism, means for changing the position of said actuating

mechanism, a working mechanism, means for starting and stopping said working mechanism, a stop motion member rotatably mounted and having two ends located in different positions, a starting and stopping member included in said starting and stopping means, said starting and stopping member being located in the path of movement of both ends of the stop motion member, means for rotating said stop motion member for either end to strike said starting and stopping member, and means for otherwise operating said stop motion member.

27. An actuating mechanism, means for changing the position thereof, a working mechanism, means for starting and stopping said working mechanism, a stop motion member comprising a rod rotatably mounted and a finger secured to and offset from said rod, means for rotating said rod to cause either its main part or said finger to operate said starting and stopping mechanism, and means for otherwise operating the rod.

28. An actuating mechanism, means for changing the position of said actuating mechanism, a driving mechanism, a clutch for controlling the operations of said driving mechanism, a clutch actuating member, a stop rod rotatably mounted, a finger offset from but secured to said rod, means for rotating the rod to bring its end or the end of said finger into line with said clutch actuating member, and means for actuating said rod.

29. An actuating mechanism, means for changing the position of said actuating mechanism, a driving mechanism, a clutch for controlling the operations of said driving mechanism, a clutch actuating member, means for holding said member with the clutch parts disengaged, a stop rod rotatably mounted, a finger offset from but secured to said rod, means for rotating the rod to bring its end or the end of said finger in line with said clutch actuating member, and means for actuating said rod.

30. A twisting machine including a twisting chuck, a holding chuck, a clutch for operating said twisting chuck, means for forcing the clutch members together, means for holding the clutch members disengaged, a clutch actuating member rotatably mounted, a finger offset from and secured to said member, means for operating said holding chuck and operatively connected with said member to rotate it to bring its end or the end of its finger in line with said clutch actuating member, and means for moving said rod lengthwise.

31. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being secured to the wire and thereby moved in the direction of shortening of the wires during the twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a holding member to retain said starting and controlling means in one position, and a member located to be operated by said movable mechanism to actuate said holding member and thereby to actuate said stopping and starting mechanism.

32. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during the twisting operation, means for operating one of said mechanisms to twist said wires, a clutch to control operations of said twisting mechanism, a holding member to retain said clutch in one position, and a member located to be operated by said movable mechanism to actuate said holding member and thereby to actuate said clutch.

33. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during the twisting operation, means for operating one of said mechanisms to twist said wires, a clutch to control operations of said twisting mechanism, a holding member to retain said clutch in one position, and a rod slidably mounted to actuate said holding member and thereby to actuate said clutch.

34. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during the twisting operation, means for operating one of said mechanisms to twist said wires, a clutch to control operations of said twisting mechanism, a clutch shifting lever normally forced in one direction, a member to hold said lever against force transmitted thereto, and a member positioned to be operated by said movable mechanism to actuate said holding member and thereby to actuate said clutch shifting lever.

35. A wire twisting machine comprising mechanisms for twisting wires held in said machine, a member movably mounted and secured to the wire and thereby moved in the direction of the shortening of the wires in twisting, means for stopping and starting said twisting mechanism, and a connection between said movably mounted member and said starting and stopping means for controlling an operation of the latter.

36. A wire twisting machine comprising mechanism for twisting wires held in said machine, a clutch to control the operation of said twisting mechanism, means for holding the clutch members in one position, and a member movably mounted and operated by

reason of the shortening of the wires in twisting to actuate said holding means and thereby to actuate said clutch.

37. A wire twisting machine comprising mechanism for twisting wires held in said machine, controlling means for starting and stopping said twisting mechanism, a treadle for operating said starting and stopping means, means for retaining said starting and stopping means in one position, a member movably mounted and operated by reason of the shortening of the wires in twisting, and a connection between said member and said retaining means to effect operation of the latter.

38. A wire twisting machine comprising mechanism for twisting wires held in said machine, a clutch to control operations of said twisting mechanism, a treadle for operating said clutch, means for retaining the clutch members in one position, a member movably mounted and operated by reason of the shortening of the wires in twisting, and a connection between said member and said retaining means to effect operation of the latter.

39. A wire twisting machine comprising mechanisms for holding opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during the twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a lever for operating said starting and stopping mechanism, and a member operatively connected with said movable mechanism and moved thereby to effect operation of said lever and consequently of said starting and stopping mechanism.

40. A wire twisting machine comprising mechanisms for holding the opposite ends of wires to be twisted, one of said mechanisms being movable to permit shortening of the wires during a twisting operation, means for operating one of said mechanisms to twist said wires, means to control the starting and stopping of said twisting mechanism, a lever for operating said starting and stopping mechanism, and a rod slidably mounted and operatively connected with said movable mechanism and moved thereby to effect operation of said lever and consequently of said stopping and starting mechanism.

ANTON VAN VEEN.