

Feb. 27, 1923.

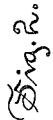
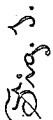
1,446,599

A. VAN VEEN

WIRE TWISTING MACHINE

Filed June 6, 1921

3 sheets-sheet 1



INVENTOR:

Anton Van Veen,

BY

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Arthur Jenkins,
ATTORNEY.

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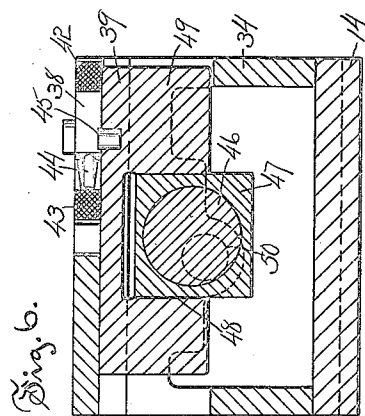
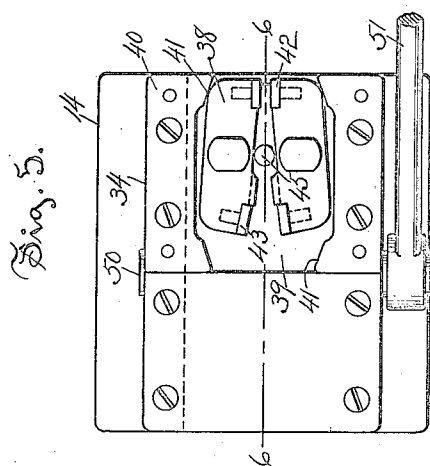
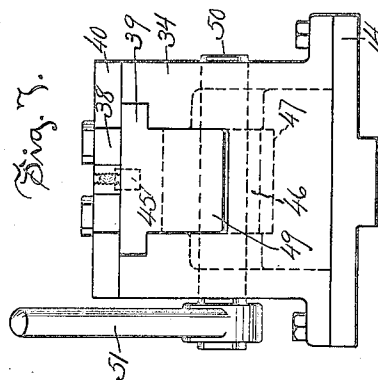
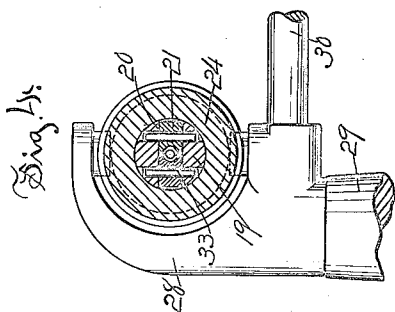
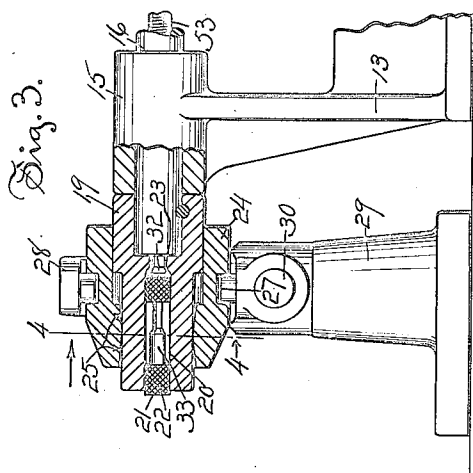
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3 sheets-sheet 2



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A. VAN VEEN

WIRE TWISTING MACHINE

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3 sheets-sheet 3

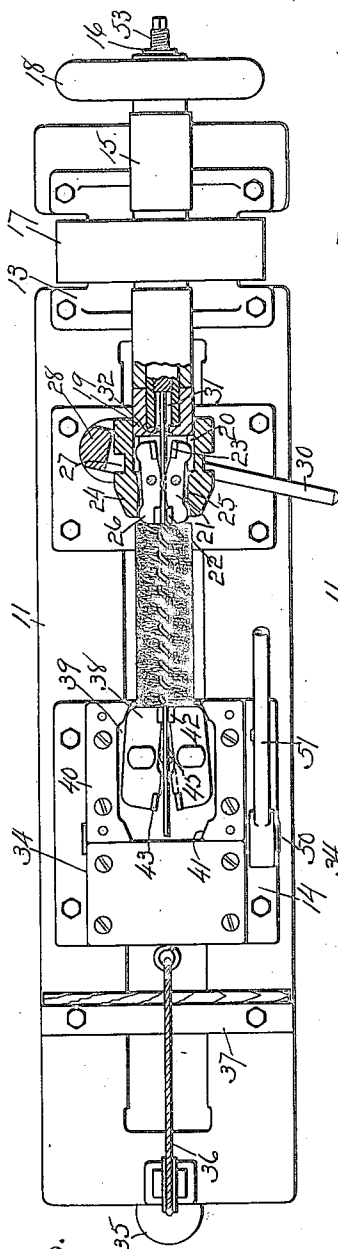


Fig. 8.

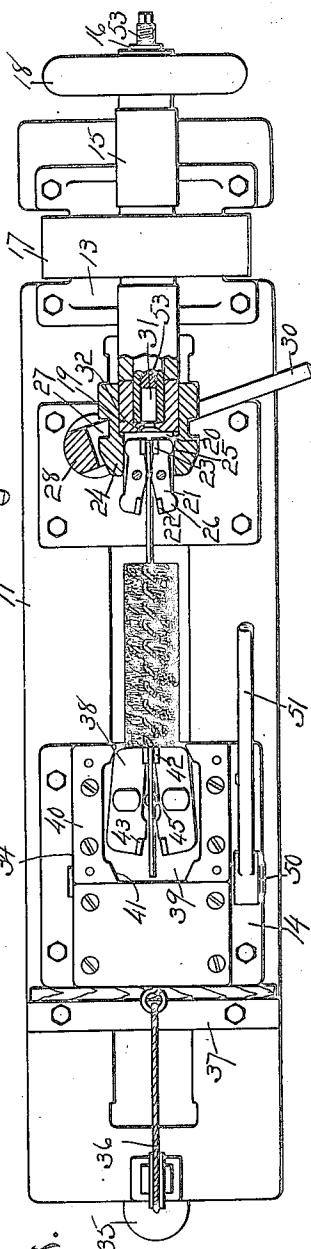


Fig. 9.

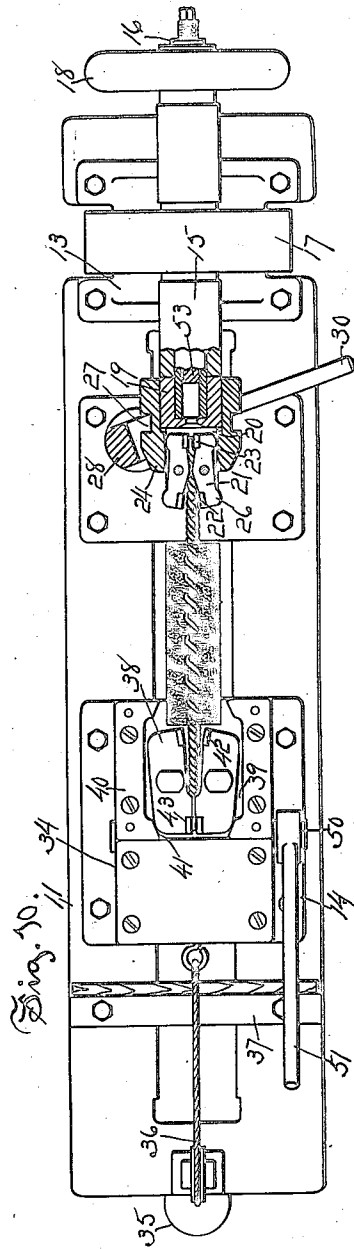


Fig. 10.

INVENTOR

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UNITED STATES PATENT OFFICE.

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

WIRE-TWISTING MACHINE.

Application filed June 6, 1921. Serial No. 475,341.

To all whom it may concern:

Be it known that I, ANTON VAN VEEN, a citizen of the United States, and resident of Hartford, in the county of Hartford, State of Connecticut, have invented a new and Improved Wire-Twisting Machine, of which the following is a specification.

My invention relates to the class of wire twisting machines more especially employed to twist wire for the purpose of securing material within the twisted coils thereof, and an object of my invention, among others, is to provide a machine of this class by means of which the twisting operations shall be simplified, and the speed of such operations increased.

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—

Fig. 1 is a top view of my improved wire twisting machine, with parts broken away to show the construction.

Fig. 2 is a view in side elevation of the same.

Fig. 3 is a detail view in side elevation of the head chuck and spindle supporting it, with parts broken away in axial longitudinal section, the scale being enlarged.

Fig. 4 is a view in cross-section through the head chuck on plane denoted by dotted line 4—4 of Fig. 3.

Fig. 5 is a top view, scale enlarged, of the tail chuck.

Fig. 6 is a view in vertical longitudinal section on plane denoted by dotted line 6—6 of Fig. 5.

Figure 7 is a view looking at right hand end of the tail chuck as shown in Fig. 5.

Figure 8 is a view similar to Figure 1, but showing the position of the parts at the completion of the operation of twisting the body portion of the brush wire.

Figure 9 is a view similar to Figure 8, but showing the position of the parts at a succeeding step in the twisting operation.

Figure 10 is another similar view show-

ing the final step in the twisting operation and before release of the twisted part of the completely twisted brush from the grasp of the chucks.

My improved machine is particularly adapted for use in the twisting of wire for the purpose of securing bristles or similar material in the twisted portion comprising the body of the twisted article for the purpose of forming a brush, and I have, for this reason, illustrated the machine in the drawings herein as performing twisting operations in connection with the manufacture of brushes, although it will be understood that the invention may extend to and be embodied in any machine in the use of which material is secured within the turns of twisted strands.

In the accompanying drawings the numeral 11 denotes the bed of my improved machine mounted on legs 12, or that may be supported in any other suitable manner. The machine comprises a head stock 13 secured to the base near one end in any suitable manner, and a tail stock 14 mounted for sliding movement at the opposite end of the bed. The head stock has bearings 15 for a live spindle 16 carrying a driving pulley 17 secured thereto and driven by means of a belt extending from any suitable source of power. A hand wheel 18 may be secured to the outer end of the spindle as a means for manually rotating it, when desired, for any purpose.

A live chuck, secured to the end of the spindle 16, comprises a chuck body 19 secured to the spindle in any suitable manner and having a slot 20 extending inwardly from its end to receive chuck jaws 21 that are pivotally secured to said body.

A pair of jaws 21 is preferably used in the chuck, each jaw having grips 22—23 at opposite ends thereof, the pivots of the jaws being located substantially midway of the length thereof. A chuck actuating sleeve 24 is mounted on the chuck body for sliding movement thereon, said sleeve having tapered actuating surfaces 25 at its outer end that

are adapted to engage hubs 26 formed at opposite ends of each jaw. These surfaces taper from a smaller diameter at the center to a larger diameter at opposite ends, one of said surfaces, when the sleeve is in its forward position, as shown in Figure 1 of the drawings, causing the front ends of the jaws to be closed together, and when the sleeve is in its opposite or rearward position the other surface engages the hubs on the opposite ends of the jaws and closes said ends together, and as illustrated in Figure 9 of the drawings. Said sleeve 24 has an annular groove 27 to receive actuating pins projecting from a yoke 28 pivotally mounted on a standard 29 secured to the bed 11, a handle 30 extending from the yoke being employed for its manual operation.

The chuck body 19 is recessed at its end to receive the spindle 16, and the latter has a recess 31 within which the ends of a pair of wires to be twisted are inserted, a stop screw 53 extending into the spindle from its end opposite said recess forming its bottom and thereby determining the proper position of such wires. The body 19 has a tapered opening 32 extending from the slot 20 and communicating with the recess 31, as shown in Figure 1, to direct the ends of wires into such recess. The jaws 21 also have mating grooves 33 on their adjacent surfaces to receive the ends of the wires and guide them in their movements into the mouth of the opening 32.

The tail stock comprises a tail block 34 that is suitably mounted for reciprocating sliding movement on the bed 11, a weight 35 connected by a flexible support 36 with the block 34 holding it in its retracted position, as against a stop 37 secured to the bed 11.

A tail chuck carried by the block 34 comprises a pair of chuck jaws 38 pivotally mounted on a chuck actuating slide 39 mounted in a slideway at the upper part of the block, said slideway being constituted as to one side of plates 40, the edges of which overlie the edges of the slide 39 to retain the latter in place. The plates 40 have chuck jaw actuators 41 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 5 and 10 of the drawings, when said jaws are carried against the actuators by movement of the slide 39. Each of the jaws 38 has grips 42-43 at opposite ends thereof and wire guiding recesses 44 are formed in the facing edges of the chuck jaws. A rest 45 is located on the slide 39 between the jaws to receive and properly position the wires to be twisted so that said wires will be received within the recesses 44 when the rear ends of the jaws are closed together.

The slide 39 is operated to actuate the jaws as by means of an eccentric 46 operating in a box 47 mounted for vertical reciprocating movement in a slot 48 in a projection 49 extending from the under side of said slide. A shaft 50 to which the eccentric is secured, is mounted in suitable bearings in the side parts of the block, said shaft having an actuating handle 51 secured thereto as a means for manual operation thereof.

In the operation of the machine when the parts are in their normal positions of rest the front or inner ends of the jaws 21, that is the ends of the jaws nearest the lengthwise center of the machine, are separated enough to receive a pair of wires, which wires are all cut to a certain length and to properly operate upon which the head stock and tail stock with parts carried thereby, are properly "set." The operative inserts the ends of a pair of wires through the recesses in the facing edges of the chuck jaws 21, said wires passing inwardly through the opening 32 and into the recess 31, and against the bottom of said recess. The handle 30 is now moved to swing the yoke 28 to move the sleeve 24 to engage the hubs 26 on the front or inner ends of the jaws and close them together to grasp the two wires. The opposite ends of the wires are pushed downwardly between the jaws 38 onto the rest 45, these ends of the wires being located a short distance only away from the back end of the recess in the block 34 in which the jaws 38 are located, and as shown in Figure 1 of the drawings. The upper wire is now raised sufficiently to permit material, as bristles 52, to be inserted and properly distributed between the wires, such material being distributed up to a point in proximity to each pair of chuck jaws. The top wire is now pushed downwardly between the jaws 38 and into contact with the other wire, and the actuating handle 51 is moved by the operative to close the front ends of the jaws 38 against the wires to hold them securely in place. In this position of the parts the block 34 rests against the stop 37. The spindle 16 is now rotated as by means of the pulley and belt hereinbefore referred to, which belt is preferably arranged in any desired manner to impart variable movement to the pulley, and that part of the wire between the pairs of chuck jaws and herein referred to as the body portion thereof will be twisted, thus securing the bristles tightly in place and imparting a spiral form to said bristles.

In this twisting operation the wire will be shortened by reason of the twist given to it and this will cause the block 34 to be drawn toward the live chuck, as shown in Figure 8 of the drawings, the weight 35 permitting such movement. The operative

now moves the handle 30 to release the chuck jaws 21 and thereupon the weight 35 will move the block 34 backwardly against the stop 37, drawing the ends of the wires in the live chuck outwardly until said ends are practically just within the outer or rear ends of said chuck jaws, and as shown in Figure 9 of the drawings. The handle 30 is now operated to close the outer ends of the jaws 21 upon the wires, and the handle 51 is operated to release the jaws at the opposite end of the machine. In this operation of the handle 51 the slide 39 carrying the chuck jaws 38 is moved backwardly until the rear ends of said jaws are practically flush with the rear ends of the wires, at which time said rear ends of the jaws will be closed together to grip the two wires, the recesses 44 within these jaws properly positioning the wires to keep them together. The live spindle being now rotated as before, the ends of the wires outside of the earlier twisted portions will be twisted, and as illustrated in Figure 10 of the drawings, the block 34 being drawn into a forward position as in the previous twisting operation of the wires. The operation being now completed, the chuck jaws are loosened and the twisted article is removed.

The recesses in the facing edges of the jaws are for the purpose of holding the wires together during the twisting operation and especially when the wires are first twisted, as otherwise they would tend to separate between the part first twisted (that contains the brush material) and their ends, and be in this separated condition when grasped by the jaw at their outer ends for the second twisting operation. This would result in the twisted part of the wires that is entered into the brush handle being too large, and it is, therefore, essential that this separating action of the wires during the twisting be prevented. It will be noted that the recesses on the jaws of the tail stock are located between the pivot and the outer or rear ends of the jaws. This causes a separation of the jaws sufficiently to permit the wires to be placed between the jaws by a movement laterally thereof, and when the jaws are closed the parts containing the recesses will be moved together and closed upon the wires to hold them. These recesses are beveled as shown in Figure 6 to readily engage the wires and move them together should they happen to be separated to any extent.

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

I claim:—

1. A support rotatably mounted, a plurality of jaws movably mounted on the support, each jaw having a plurality of gripping surfaces, an actuating sleeve surrounding said jaws and having a jaw actuating surface thereon, and means for effecting relative movement between the sleeve and jaws to cause either gripping surface on each of the jaws to grip an article.

2. A support rotatably mounted, a plurality of jaws pivotally mounted on the support, each jaw having a plurality of gripping surfaces, an actuating sleeve surrounding said jaws, and having a jaw actuating surface therein, and means for effecting relative movement between the sleeve and jaws to cause either gripping surface on each of the jaws to grip an article.

3. A support rotatably mounted, a plurality of jaws movably mounted on the support, each jaw having a plurality of gripping surfaces, an actuating sleeve surrounding said jaws and having a jaw actuating surface therein, and means for moving the sleeve to engage said gripping surfaces and thereby actuate the jaws.

4. A support rotatably mounted, a plurality of jaws movably mounted on the support, an actuating member having jaw actuating surfaces between which said jaws are mounted, and means for effecting relative movement between said actuating member and jaws to operate the latter.

5. A wire twisting machine comprising a support, a spindle rotatably mounted on the support, a plurality of jaws pivotally mounted on the spindle and having a plurality of gripping surfaces spaced apart to grip different portions of wires, an actuating member having jaw actuating surfaces for engagement with said jaws, and means for effecting relative movement between said member and said jaws to operate the latter.

6. A wire twisting machine comprising a support, a spindle rotatably mounted on the support, a plurality of jaws pivotally mounted on the spindle and having a plurality of gripping surfaces spaced apart to grip different portions of wires, an actuating member having jaw actuating surfaces for engagement with said jaws, and means for operating said actuating member to operate the jaws.

7. A wire twisting machine comprising a support, a jaw movably mounted on the support and having gripping surfaces spaced apart to grip different portions of wires, means independent of said jaw for supporting said wires, means for actuating the jaw to grip the wires, and means for effecting relative rotation as between the wires and said jaw, to twist said wires.

8. A wire twisting machine comprising a

support, a jaw movably mounted on the support and having gripping surfaces spaced apart to grip different portions of wires, means independent of said jaw for supporting said wires, means for actuating the jaw to grip the wires, and means for rotating the jaw to twist said wire.

9. A wire twisting machine comprising a support for one end of a plurality of wires, a spindle rotatably mounted opposite said support and having a pair of pivotally mounted jaws to receive the ends of wires between them, said jaws having wire gripping surfaces at opposite ends thereof, jaw actuating means to operate said jaws, and means for effecting relative movement between said jaws and jaw actuating means to bring the gripping surfaces at either ends of said jaws into action.

10. A wire twisting machine comprising a support for one end of a plurality of wires, a spindle rotatably mounted opposite said support and having a pair of pivotally mounted jaws to receive the ends of wires between them, said jaws having wire gripping surfaces at opposite ends thereof, and a sleeve surrounding said jaws and movable lengthwise to bring the gripping surfaces at either ends of the jaws into action.

11. A wire twisting machine comprising a support, a slide movably mounted on the support, means acting upon the slide to yieldingly force it in one direction, means mounted on said slide to hold wires for twisting operation, means located off from said slide to hold said wires, one of said holding means including a jaw having a plurality of gripping surfaces, and means for actuating said jaws to bring either of said gripping surfaces into action to clamp wires for twisting operations.

12. A wire twisting machine comprising a support, a slide movably mounted upon the support, means acting upon the slide to force it in one direction, a jaw movably mounted on the slide and having a plurality of gripping surfaces, means for actuating said jaw to bring either of said gripping surfaces into action to clamp at one location a plurality of wires to be twisted, means for holding wires at another location thereon, and means for effecting an operation upon said wires.

13. A wire twisting machine comprising a support, a slide movably mounted upon the support, means acting upon the slide to force it in one direction, means upon said slide for holding a plurality of wires to be twisted, a jaw movably mounted on the support and having gripping surfaces spaced apart to grip different portions of said wires, means for actuating said jaws to grip the wires, and means for rotating said jaws to twist said wires.

14. A wire twisting machine comprising a

support, jaws mounted upon said support to grip wires upon opposite sides thereof, each of said jaws having a plurality of gripping surfaces, means for actuating each jaw to bring its different gripping surfaces into action upon said wires; and means for effecting twisting operation on said wires while held by said jaws.

15. A wire twisting machine comprising a support, a spindle upon said support, jaws mounted upon said spindle to grip opposite sides of a wire, each of said jaws having a plurality of gripping surfaces, means for actuating each jaw to bring its different gripping surfaces into action upon said wire, and means for rotating said spindle for twisting operations.

16. A wire twisting machine comprising a support, a tail stock and a head stock located on said support, one of said stocks being slidably mounted, a spindle rotatably mounted on the head stock, means upon the tail stock and upon the spindle for gripping wires to be twisted, one of said gripping means including a movably mounted jaw to grip wires at different parts of said jaw, and means for operating said jaw to effect said gripping actions.

17. A wire twisting machine comprising a support, a tail stock slidably mounted on the support, means for forcing the tail stock in one direction, means upon the tail stock for gripping a plurality of wires, a rotatably mounted spindle located opposite the tail stock, a jaw mounted in said spindle, and means for operating said jaw to grip a plurality of wires in different positions along their length.

18. A wire twisting machine comprising a support, a tail stock and a head stock, one of said stocks being slidably mounted on the support, a jaw upon one of said stocks, said jaw having a plurality of gripping surfaces for gripping wires at different points lengthwise thereof, means for operating said jaws, means on the other stock for gripping wires, and means for effecting twisting operations of said wires.

19. A wire twisting machine comprising a support, a tail stock and a head stock, one of which stocks is slidably mounted on the support, means for exerting force upon one of said stocks in one direction, a jaw upon one of said stocks, said jaw having a plurality of gripping surfaces for gripping wires at different portions of their length, means for operating said jaws, means on the other stock for gripping a plurality of wires, and means for effecting twisting operation upon said wires.

20. A wire twisting machine comprising a support, a tail stock slidably mounted on the support, means for forcing the tail stock in one direction, means upon the tail stock for gripping wires to be twisted, a head

stock, a spindle rotatably mounted in the head stock, a jaw mounted on the spindle and having a plurality of gripping surfaces to grip said wires at different portions along their length, and means for operating said jaw.

21. A wire twisting machine comprising a support, a tail stock and a head stock, one of said stocks being slidably mounted on said support, a stop for said slidably mounted stock, means for yieldingly forcing said slidable stock toward said stop, a spindle rotatably mounted in the head stock, wire holding means carried by the tail stock and by the spindle, and mechanism for operating one of said wire holding means to permit movement of a wire with respect thereto by reason of the movability of said slidably mounted stock.

22. A wire twisting machine comprising a support, a tail stock slidably mounted on the support, a stop for said tail stock, means for forcing the tail stock toward said stop, a head stock, a spindle rotatably mounted on the head stock, a jaw carried by the tail stock and a jaw carried by the spindle, each jaw having a plurality of gripping surfaces for gripping wires at different portions along their length, and means for actuating said jaws to grip the wires.

23. A support, a jaw movably mounted on the support and having a plurality of gripping surfaces, and a recess between said gripping surfaces to hold wires together while being twisted, and means for actuating the jaw to cause either gripping surface to independently grip a wire.

24. A support, jaws pivotally mounted on the support and having gripping surfaces at their ends and recesses on their meeting edges arranged to open, and to close to hold wires while being twisted, and means for actuating the jaws to cause either pair of gripping surfaces to grip a plurality of wires.

25. A wire twisting machine comprising a support, a head stock and a tail stock, one of said stocks being slidably mounted to permit forward movement thereof caused by the shortening of the wire in the twisting operation, means upon both of said stocks for holding the wires for twisting operation, means for twisting said wires, means for forcing said slidable stock backwardly, and mechanism for operating one of said wire holding means to release and grip a wire.

26. A wire twisting machine comprising a support, a head stock mounted on the support, means upon the head stock for holding a wire, means upon the head stock for twisting a wire, a tail stock slidably mounted to permit forward movement thereof caused by shortening of a wire in the twisting operation, means for forcing the tail stock backwardly, means upon said tail stock to hold a

wire, and mechanism for operating one of said wire holding means to grip and release a wire.

27. A wire twisting machine comprising a support, a head stock and a tail stock, a spindle mounted upon the head stock, wire holding means carried by the head stock and spindle, one of said stocks being slidably mounted to change the relative positions of said wire holding means, other means for changing the relative positions of said wire holding means, and means for rotating said spindle for twisting operations.

28. A wire twisting machine comprising a tail stock and a head stock, a spindle rotatably mounted on the head stock, wire holding means mounted on the tail stock and on the spindle, mechanism for moving the wire holding means on the tail stock to change its relative position with respect to the wire holding means on the spindle, means for moving one of said stocks to otherwise change the relative position of said wire holding means, and means for rotating said spindle.

29. A wire twisting machine including a head stock, a spindle rotatably mounted on the head stock, wire holding means mounted on said spindle, a tail stock slidably mounted, wire holding means on said tail stock and mechanism for moving the wire holding means on the tail stock to change its position relatively to the holding means on the spindle.

30. A wire twisting machine including a head stock with wire holding and twisting mechanism thereon, a tail stock slidably mounted, a slide upon the tail stock, wire holding means mounted on said slide, and means for operating said slide to move the wire holding means thereon relatively to such means on the head stock.

31. A wire twisting machine including a head stock with wire holding and twisting mechanism thereon, a tail stock slidably mounted, means for yieldingly forcing said tail stock away from the head stock, a slide mounted upon the tail stock, wire holding means mounted on said slide, and mechanism for moving said slide to position said wire holding means relatively to such means on the head stock.

32. A wire twisting machine including a head stock with wire holding and twisting mechanism thereon, a tail stock slidably mounted, means for yieldingly forcing the tail stock away from the head stock, a stop for limiting such movement of the tail stock, a slide carried by the tail stock, wire holding means mounted on said slide, and mechanism for operating said slide to position wire holding means thereon relatively to such means on the head stock.

33. A wire twisting machine including a head stock with wire holding and twisting

mechanism thereon, a tail stock, a slide mounted on the tail stock, wire holding means mounted on the slide, mechanism to effect operation of said wire holding means by the movement of said slide, and means for moving said slide.

34. A wire twisting machine including a head stock with wire holding and twisting

mechanism thereon, a tail stock slidably mounted, a slide mounted on the tail stock, 10 wire holding means mounted on the slide, mechanism to effect operation of said wire holding means by the movement of said slide, and means for moving said slide.

ANTON VAN VEEN.