No. 625,591. Patented May 23, 1899.

F. F. NEFF.

WIRE TWISTER FOR MAKING CORK RETAINERS.

(Application filed Sept. 17, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

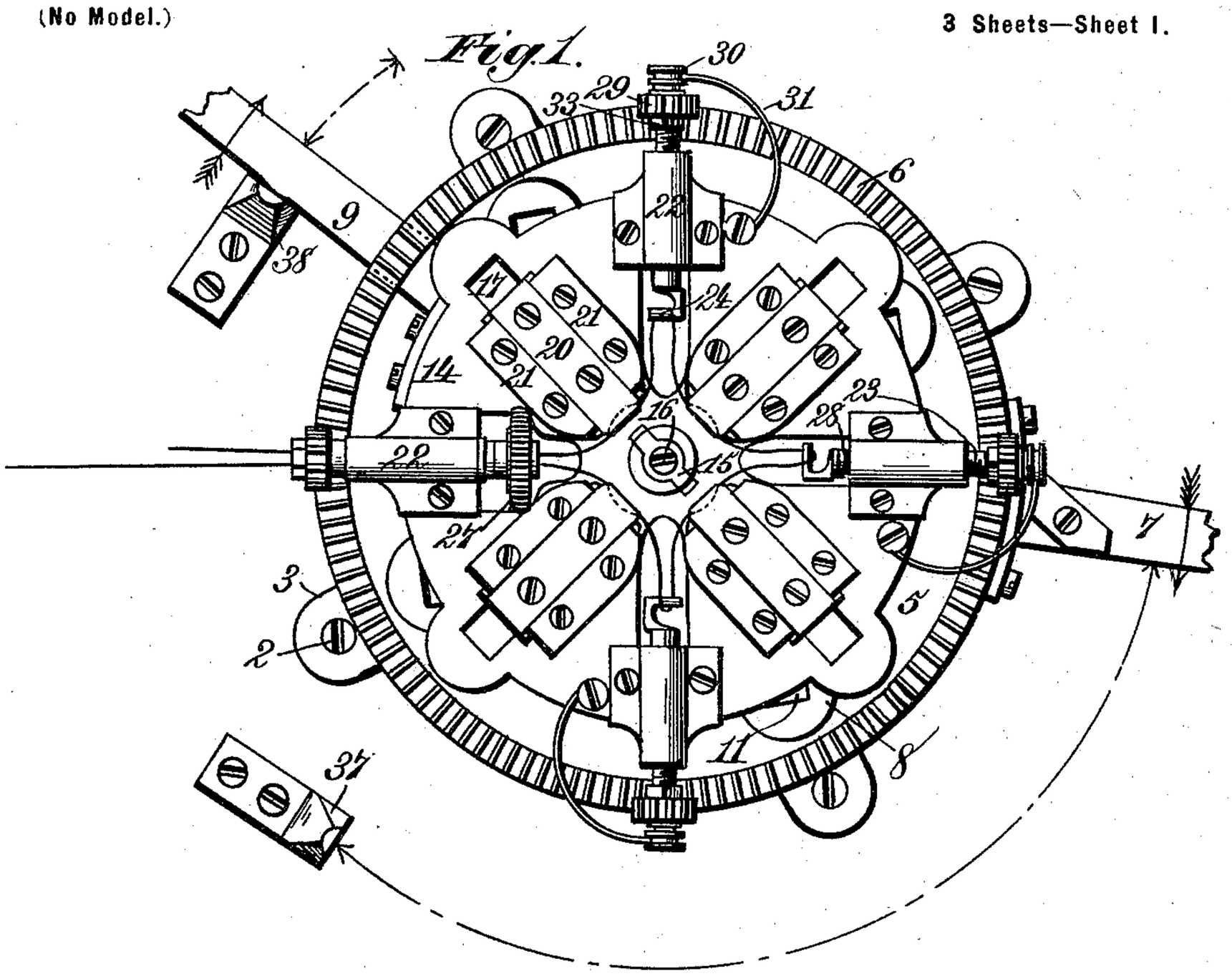
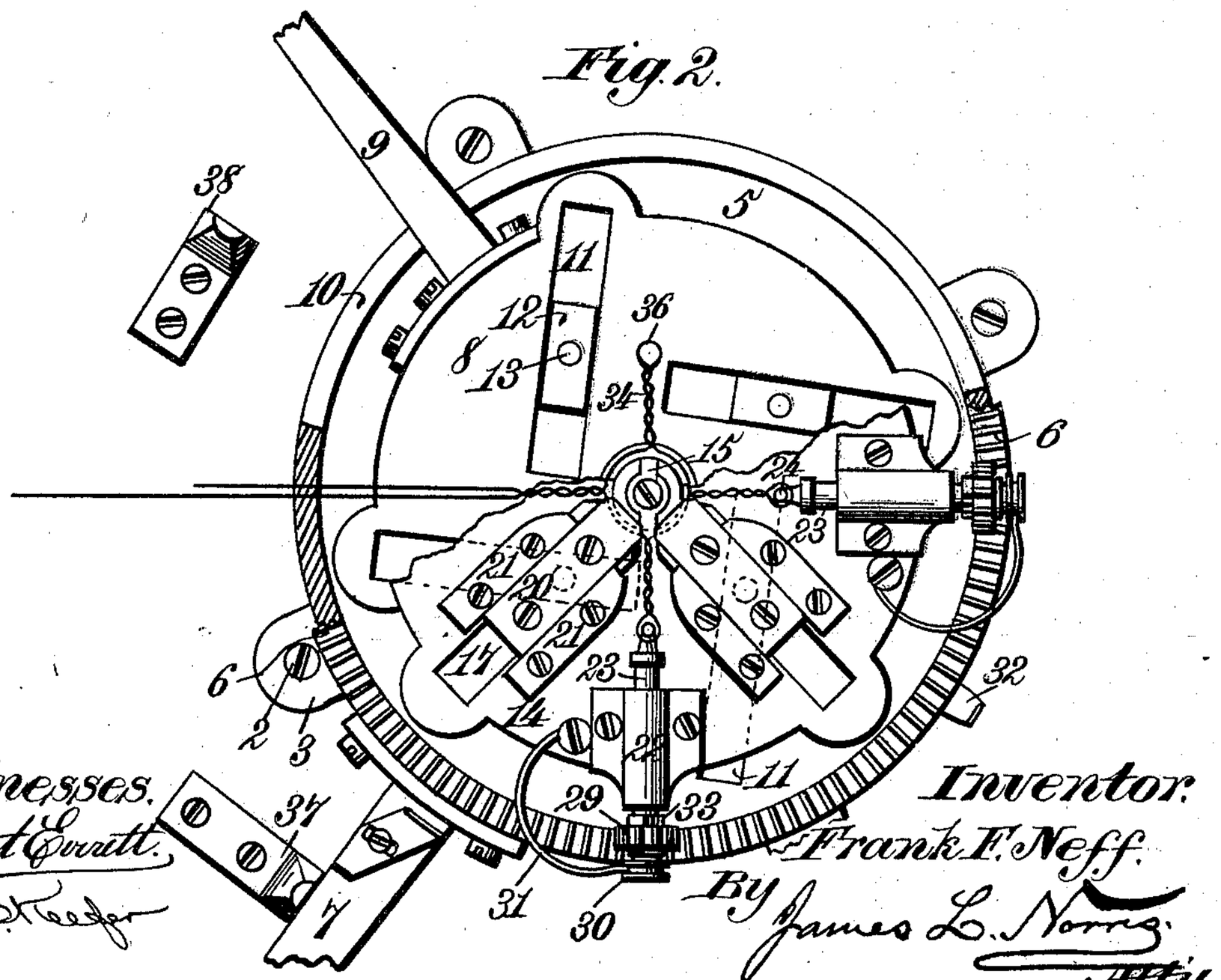


Fig. 2.



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No. 625,591. Patented May 23, 1899.

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(Application filed Sept. 17, 1898.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 3.

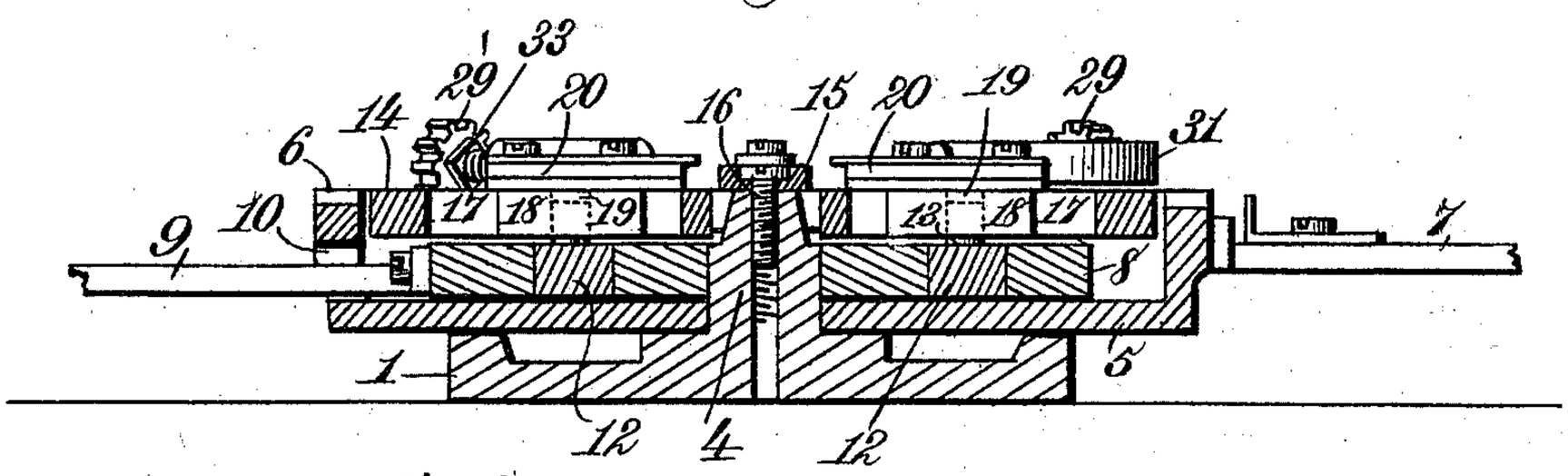


Fig. 4.

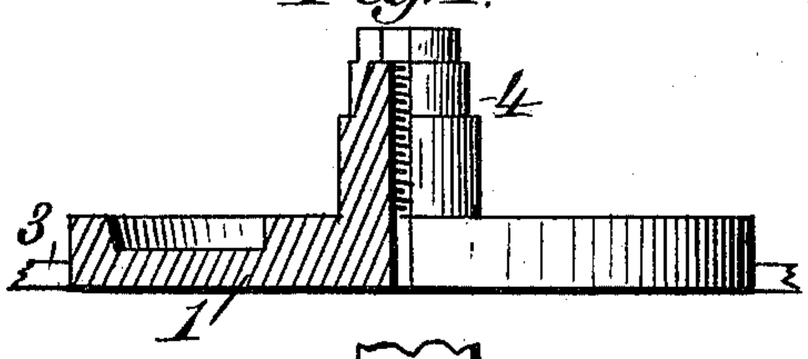


Fig. 6.

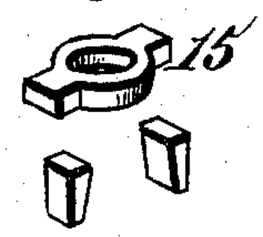


Fig. 5.

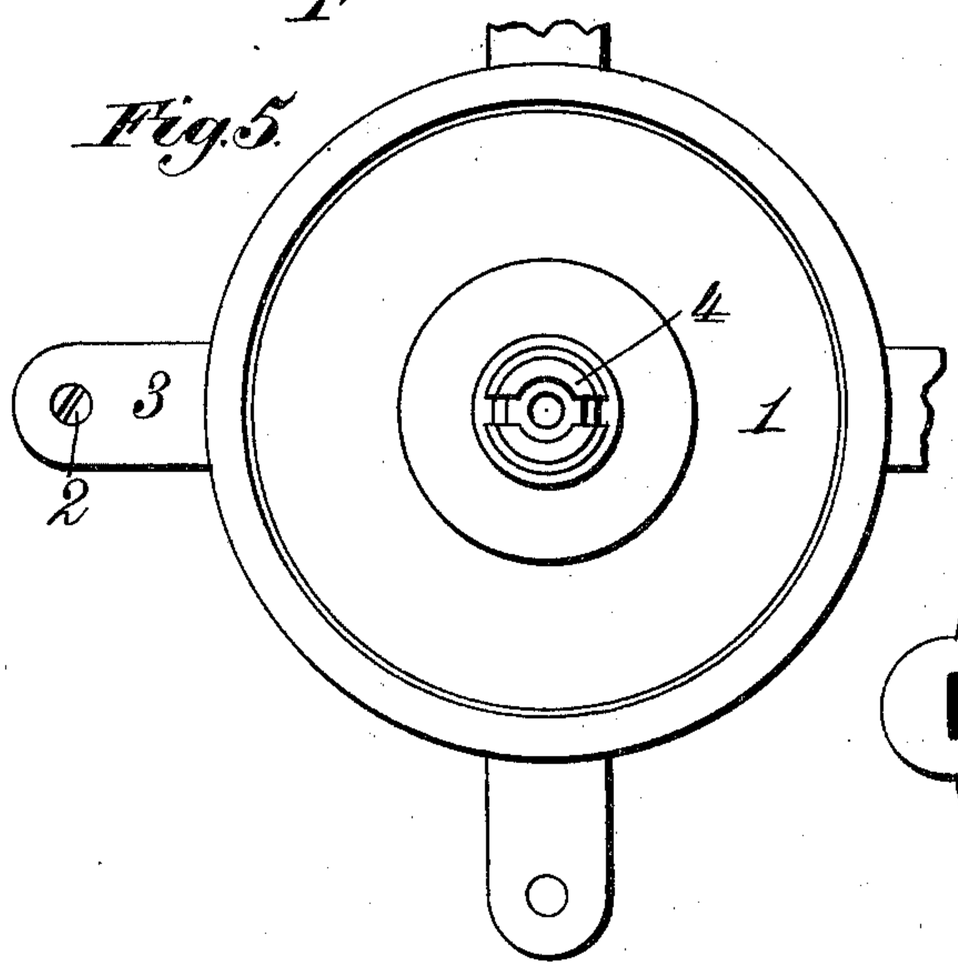
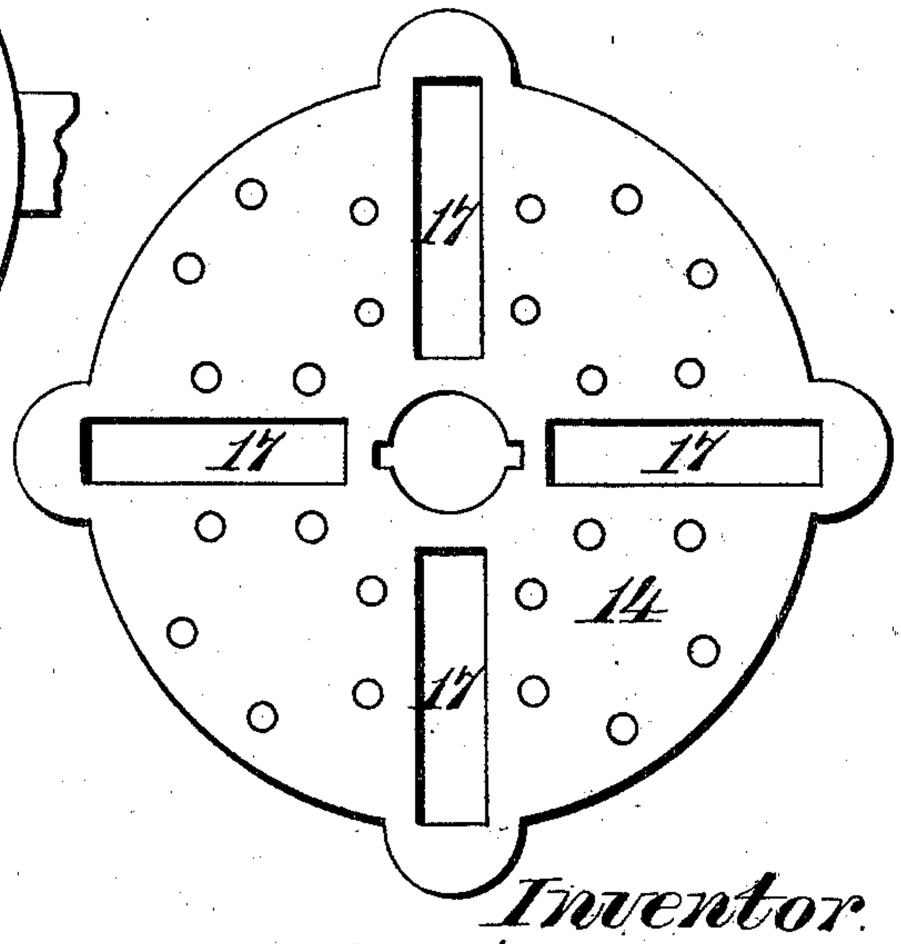


Fig. 7.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 8.

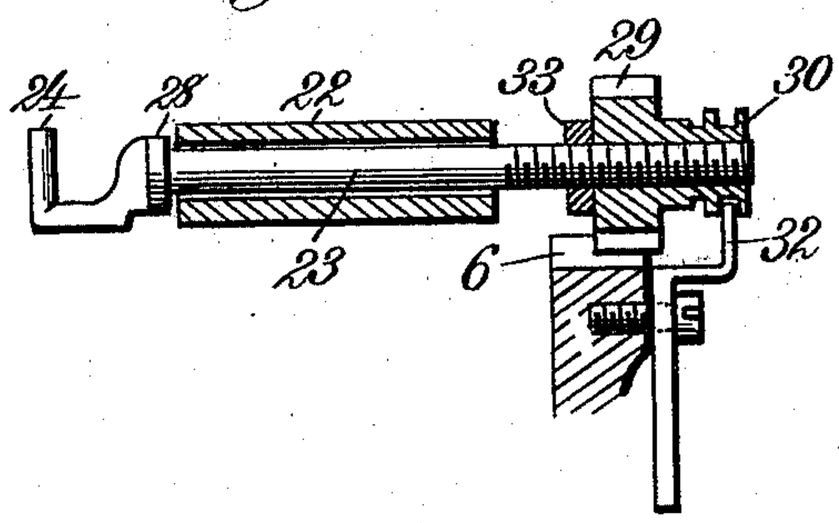


Fig. 9.

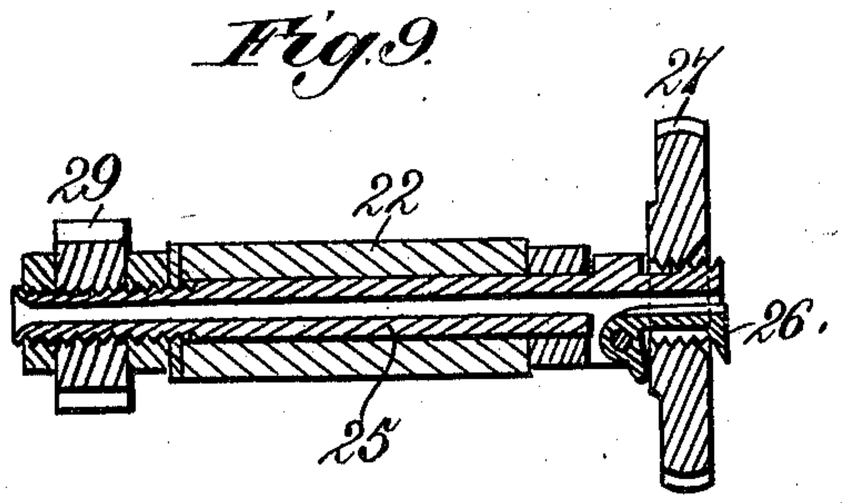


Fig. 10.

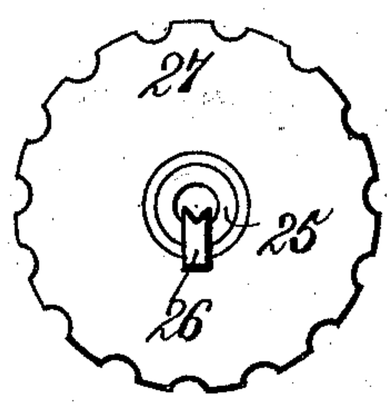
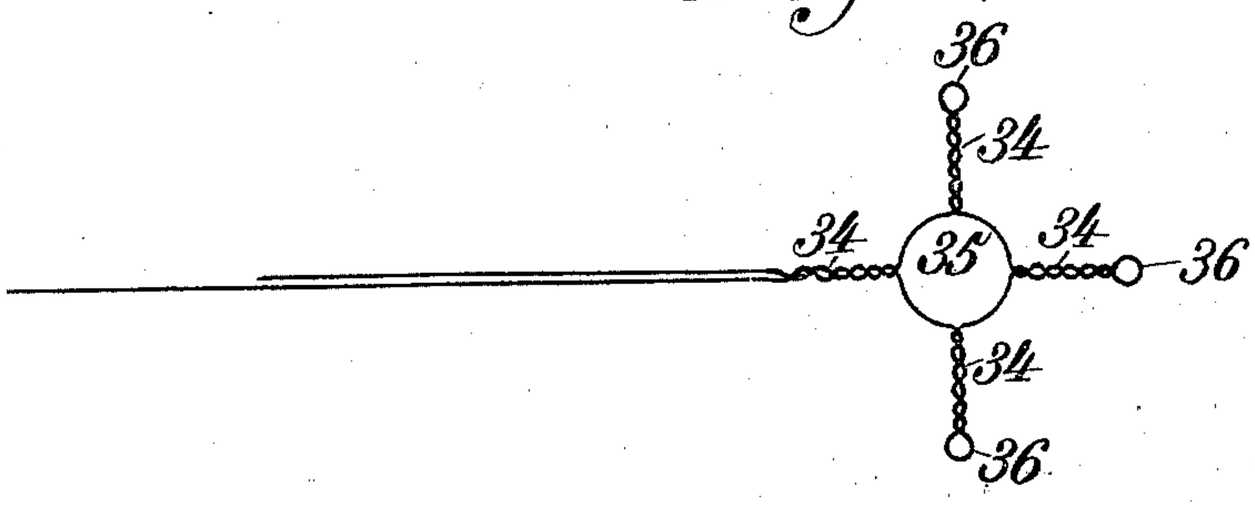


Fig. 11.



Witnesses.
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UNITED STATES PATENT OFFICE.

FRANK F. NEFF, OF PRATTSBURG, NEW YORK.

WIRE-TWISTER FOR MAKING CORK-RETAINERS.

SPECIFICATION forming part of Letters Patent No. 625,591, dated May 23, 1899.

Application filed September 17, 1898. Serial No. 691,211. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. NEFF, a citizen of the United States, residing at Prattsburg, in the county of Steuben and State of New York, have invented new and useful Improvements in Wire-Twisters for Making Cork-Retainers, of which the following is a specification.

This invention relates to machines for twisting wire, and has for its object to provide improved mechanism suitable for rapid and uniform twisting of wire into a preliminary form for the production therefrom in another machine of wire caps, hoods, or retainers that are commonly used for securing corks in bottles filled with effervescent liquids.

My invention consists in features of construction and novel combinations of parts in wire-twisting mechanism, as hereinafter described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a plan of the wire-twisting machine, showing the manner of threading the wire. Fig. 2 is a sectional plan with a portion of the top disk broken away and showing the operation of twisting the wire. Fig. 3 is a vertical transverse section of the machine. Fig. 4 is a part-sectional elevation of the machine-base and its central vertical stationary shaft. Fig. 5 is a plan of the same. Fig. 6 is a view of key mechanism for securing the top plate or disk rigidly to the stationary shaft of the machine-base. Fig. 7 is a plan of the stationary top disk. Fig. 8 is an enlarged part-sectional detail of one of the rotary twisting devices. Fig. 9 is an enlarged sectional detail of the rotary twisting device through which the wire is threaded and in which it is clamped. Fig. 10 is an inner end elevation of the same. Fig. 11 is a view of a twisted-wire frame produced in this machine preparatory to the making of a cork-retaining wire cap.

The reference-numeral 1 designates the machine-base, which is preferably circular and secured in a horizontal position to the top of a table or bench by means of bolts or screws 2, passed through lugs 3, provided for that purpose. In the center of the base 1 there is a vertical stationary shaft 4, around which is placed an oscillatory disk 5, that is supported on the machine-base. This oscillatory disk 5 carries a circular cogged rim or crown-gear 6, having a lever 7 secured thereto, by which in the operation of wire-twisting the crown-gear is to be turned part way around and back through nearly one-half circle. Immediately upon the crown-gear disk 5, around the stationary shaft 4 and within the circle formed by the crown-gear 6, there is placed a slotted disk or plate 8, having secured thereto a lever 9, that projects through an elongated slot 10, formed in the crown-gear. By means of this lever 9 the disk 8 is to be oscillated in directions opposite to the movements given to the crown-gear. In this oscillatory disk 8 there are cut a series of elongated straight slots 11, each of which is at an angle to the stationary shaft 4, on which the said disk is oscillated. Each of these slots 11 receives and guides a carrier-block 12, having at about its center a vertical pin 13. Above the oscillatory disk 8 there is arranged a stationary disk 14, that is secured to the top of the stationary vertical shaft 4 by means of a key 15 and screw 16 or otherwise. This stationary disk 14 has formed therein a series of radial slots 17, corresponding in number with the slots 11 of the oscillatory plate 8; but while the slots 11 are at right angles to the shaft 4 the slots 17 are directly radial to said shaft. In each of the radial slots 17 formed in the stationary plate or disk 14 there is arranged a radially-reciprocating die-block 18, having at about its center an opening 19, that receives the vertical pivot-pin 13 of one of the carrier-blocks 12. Secured to the tops of the die-blocks 18 and projecting beyond the same are plates 20, the side edges of which are rabbeted to slide beneath correspondingly-rabbeted edges of gibs 21, that are secured to the top of the stationary disk 14, thus preventing the dies 18 from lifting.

From the relative arrangement of the slots in the oscillatory disk 8 and stationary disk 14 and the manner of connecting the die-blocks 18 and their carrier-blocks 12 it will be obvious that when the lever 9 is thrown in one direction the dies 18 will be moved simultaneously outward, while a contrary movement of said lever will carry all the dies uniformly inward toward the central shaft. Inasmuch as the slots in the stationary disk 14 are radial to the central vertical shaft 4 and

the slots in the oscillatory disk 8 are at angles with said shaft and with the slots of the stationary disks, any movement of the oscillatory disk will change the distance between the central stationary shaft 4 and the points where the blocks 12 and 18 intersect at the pivot-pins 13, that serve as axles for the die-carrier blocks. Thus by operating the lever 9 the dies are all uniformly moved to and from the center shaft, the upper portion of which will serve as a mandrel in forming the center ring of the twisted-wire frame that is to be made in this machine. On the top of the stationary disk or plate 14 are bearings 22 for rotary radially-arranged shafts 23, three of which I have shown as being provided with hooks 24 on their inner ends. A similar bearing is provided for a rotary and radially-arranged tubular shaft 25, that has no hook; but in the inner end of this tubular shaft 25 there is a dog 26, that is operated by means of a milled nut or thumb-wheel 27 on a screw-threaded portion of the shaft, so that the dog 26 may be made to clamp or release a piece of wire fed or threaded into the machine. On each hook-shaft 23 there is preferably a washer 28, next to the bearing in which the shaft rotates. The outer portions of the several radial shafts are provided with pinions 29 in mesh with the crown-gear 6, so that when the crown-gear is moved forward or back the shafts 23 and 25 will receive a corresponding rotation. There is carried on the outer end of each shaft 23 a circumferentially-grooved head 30, the inner side of which provides a bearing for one end of a spring 31, the other end of which is secured to the top of the stationary plate or disk. By the action of the springs 31 the hook-shafts 23 are drawn normally outward from the central vertical shaft 4 before the machine is wired or threaded. At suitable points around the outside of the crown-gear 6 and carried thereby there are lugs 32, that are adapted to engage the circumferential grooves of the heads 30, and thus hold the hook-shafts 23 outward a uniform distance from the central stationary shaft 4 while the machine is being wired preparatory to twisting. The pinions 29 and circumferentially-grooved heads 30 may be screw-threaded onto their shafts, and lock-nuts 33 may be provided at the inner sides of the pinions. Thus by removing the washers 28 and loosening the lock-nuts 33 the hook-shafts 23 can be adjusted longitudinally outward and the pinions 29 can be adjusted inward thereon, so as to readily permit a use of the machine for making cork-retaining wire frames having longer twisted arms than would be required for comparatively short-neck bottles. By thus providing a longitudinal adjustment for the rotary hook-shafts 23 the machine is easily adapted to the making of twisted-wire frames for the production of cork-retaining wire caps having either long or short twisted arms, according to the requirements of large or small bottles.

When there is no wire in the machine, the rotary hook-shafts 23 are thrown normally outward by their springs 31, thus carrying the circumferentially-grooved heads 30 into position where they will be engaged by the lugs 32 on the crown-gear 6 as the latter is turned into proper position to prepare the machine for threading or wiring. By imparting movement to the lever 9 in the proper direction all the dies 18 will be thrown uniformly outward away from the central vertical shaft 4, and the thumb-wheel 27 should now be manipulated in such manner as to throw open the dog 26, so that wire can be fed into the machine. The wire may be drawn off from a coil or reel by hand and is threaded or fed in through the tubular shaft 25 and then around under the projecting forward end of each die top plate 20 and engaged with each hook 24, after which it is passed back and outward through the tubular shaft 25 and is then drawn taut or put under proper tension, and then by turning or screwing up the milled nut or wheel 27 the dog 26 will be made to bear upon or clamp the wires and so secure them from slipping. While the wire is being thus threaded into the machine and secured therein by the dog 26 the lugs 32 will remain in engagement with the grooved heads 30, thereby holding the shafts 23 securely retracted while the wire is being threaded onto the hooks 24, which purpose the springs 31 alone are hardly stiff enough to accomplish. By holding the hooks 24 retracted during the wiring of the machine I am able to draw the wire to a proper degree of tension without liability of pulling any hook toward the machine center. Therefore when the twisted-wire frame is completed all the twisted-wire arms or prongs will be of uniform length, and this I could not accomplish except by providing some adequate means for locking the longitudinally-movable and rotary hook-shafts 23 in retracted position during the wiring of the machine. In this way I can not only get a wire frame having arms of equal length, but also the machine is much more easily and quickly threaded, thereby securing a much quicker operation. The machine being now properly threaded or wired, the lever 9 should be thrown in the proper direction to carry the dies 18 uniformly inward to the center of the machine, thereby forcing the contiguous portions of wire against and around the upper portion of the central stationary shaft 4, as onto a mandrel, and so shaping and securing the wire thereon before the arms are twisted. The crown-gear lever 7 is now to be thrown in the proper directions to carry the crown-gear 6 part way around and back through nearly one-half a circle, thus rotating the shafts 23 25, and thereby forming the twisted arms 34 of the wire frame, which comprises also a central circular body

portion or ring 35, that is perfectly formed by means of the cylindrical stationary central shaft 4, around which the said frame is pressed or drawn while its arms are being twisted. When the crown-gear 6 is started on its first movement in the twisting operation, the lugs 32 are carried with said gear and become disengaged from the grooved heads 30, so as to leave the shafts 23 free and held back only by the springs 31 while the gear works; but as the wire arms 34 are twisted the hooks 24 must necessarily approach the central stationary shaft 4, and to permit this inward movement of the rotary hook-shafts 23 against the action of the springs 31 a sufficient distance is provided between their bearings 22 and the lock-nuts 33 on said shafts. Now when the twisting of the wire is nearly finished the lock-nuts 33 strike against the ends of the bearings 22, thus stopping the inward movement of the hooks 24, and as for a short time the wire continues to twist it is thereby drawn tightly around the hooks, so as to form uniform eyes 36 on the ends of the twisted-wire-frame arms. The wire being cut at a suitable point outside the machine and the dies 18 and dog 26 being released and moved back, the wire frame may be readily disengaged from the stationary shaft 4, hooks 24, and tubular shaft 25, whereupon the springs 31 will immediately throw the hook-shafts 23 longitudinally outward into normal position for rewiring the machine and repeating the described operations.

As before explained, the washers 28 may be removed and the lock-nuts 33, pinions 29, and grooved heads 30 be set farther inward on the rotary hook-shafts, thereby adjusting the machine for making wire frames with longer twisted arms. By this mode of working the hooks 24 farther from the center of the machine I of course get longer frame-arms and larger work. The wire frames made in this machine are to be afterward formed into cork-retaining caps by the operation of shaping-machine that is the subject of a separate application.

37 and 38 are stops for the machine-levers.

What I claim as my invention is—

1. In machines for twisting wire, the combination of a base having in its center a stationary vertical shaft, a crown-gear provided with an operating-lever and adapted to be oscillated around said stationary shaft, an oscillatory disk placed around said shaft within the crown-gear and provided with series of slots located at angles to the said central shaft, die-carrier blocks located in said slots, a stationary plate or disk keyed to the central stationary shaft and having a series of slots radial to said shaft, radially-movable dies located in said slots and having pivotal connections with the die-carrier blocks, a lever attached to the said oscillatory plate whereby the said dies are movable uniformly toward and from the central stationary shaft, a series of rotary and longitudinally-movable hook-shafts mounted radially on said stationary plate, a tubular rotary shaft mounted radially on said plate and having a dog at its inner end, a nut or thumb-wheel to operate said dog, and pinions on said radial shafts, in mesh with the crown-gear, substantially as described.

2. In machines for twisting wire, the combination of a base having in its center a stationary vertical shaft, a crown-gear provided with an operating-lever and having a slot in one side, an oscillatory disk placed around the central stationary shaft within the crown-gear and provided with series of slots at angles to said shaft, die-carrier blocks located in said slots and each provided with a vertical projecting pin, a stationary plate or disk secured around the stationary shaft and provided with series of slots radial to said shaft, radially-movable dies placed in said radial slots and engaged with the pivots of the die-carrier blocks, a lever attached to the oscillatory disk and extended through the slot of the crown-gear, a series of rotary and longitudinally-movable hook-shafts mounted radially on the top of the stationary plate, means for adjusting said hook-shafts longitudinally to and from the center, locking mechanism to hold the hook-shafts retracted, springs for said hook-shafts, a tubular rotary shaft mounted radially on the stationary plate and provided with wire-clamping mechanism, and pinions on said radial shafts in mesh with the crown-gear, substantially as described.

3. In machines for twisting wire, the combination of a base having in its center a vertical stationary shaft, a crown-gear arranged to be oscillated around said shaft, an oscillatory plate mounted around the stationary shaft within the crown-gear and carrying a series of die-carrier blocks movable at angles to the central stationary shaft, a stationary plate or disk secured to said shaft above the oscillatory disk and provided with series of radial slots, radially-movable dies located in said slots and uniformly actuated from the oscillatory disk and its die-carrier blocks, gibs for said radially-movable dies, a series of rotary and longitudinally-movable hook-shafts mounted radially on the stationary plate or disk, a tubular rotary shaft mounted radially on the said plate and provided with a wire-clamping dog, pinions on said shafts in mesh with the crown-gear, circumferentially-grooved heads on the hook-shafts, lugs on the crown-gear to engage the said heads and hold the hook-shafts retracted, and springs for said hook-shafts, substantially as described.

4. In machines for twisting wire, the combination of a base having in its center a vertical stationary shaft, a crown-gear mounted to oscillate around said shaft, an oscillatory plate placed around the stationary shaft within the crown-gear and provided with die-carrier blocks movable at angles with said shaft, a stationary plate secured around the stationary shaft and provided with series of radial

slots, radially-movable dies located in said slots and having pivotal connection with the die-carrier blocks, and series of twisting devices mounted radially on the stationary plate or disk, substantially as described.

5. In machines for twisting wire, the combination of a base having a vertical stationary shaft, a crown-gear mounted to oscillate around said shaft, an oscillatory plate placed around said shaft within the crown-gear and provided with series of slots at angles with the stationary shaft, a stationary plate or disk secured around the stationary shaft and provided with radial slots, radially-movable dies located in said radial slots and provided with pivotally-connected die-carrier blocks located in the slots of the oscillatory disk, and adjustable twisting devices mounted on the top of the stationary disk, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK F. NEFF.

Witnesses:
RICHARD E. DEIGHTON,
H. E. RANDALL.