June 6, 1933. H. C. HERR 1,912,940

WIRE STRAIGHTENING MACHINE

Filed Feb. 21, 1931 2 Sheets-Sheet 1

Fig. 1.

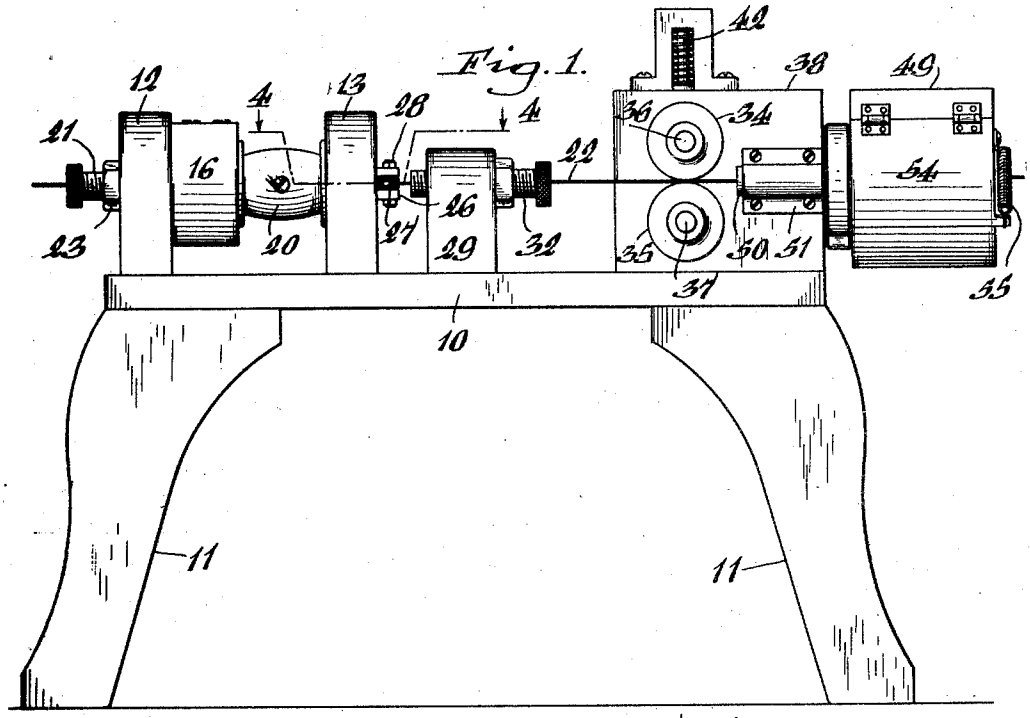
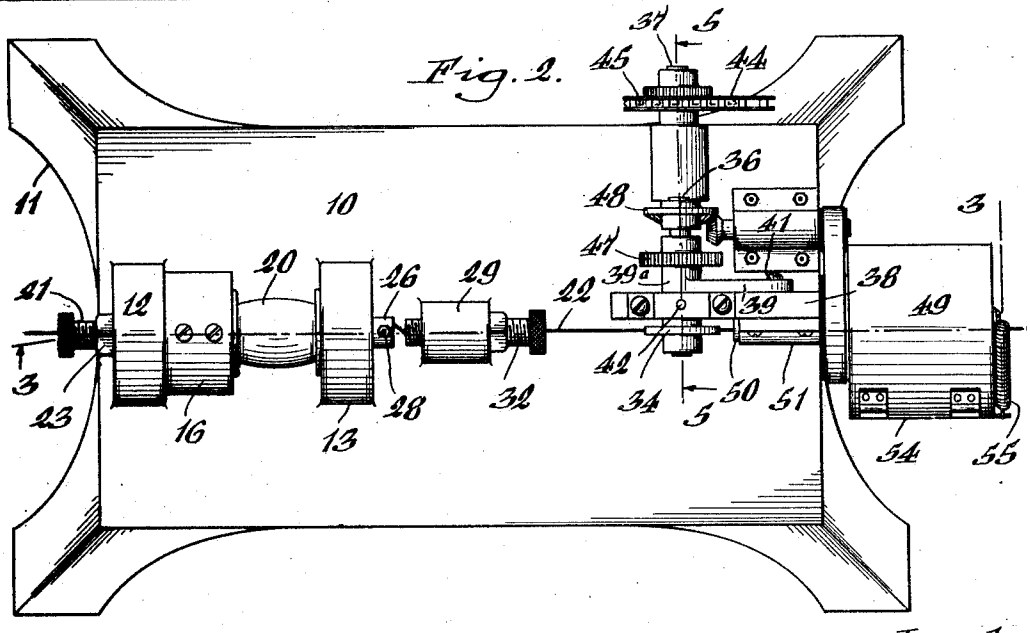


Fig. 2.



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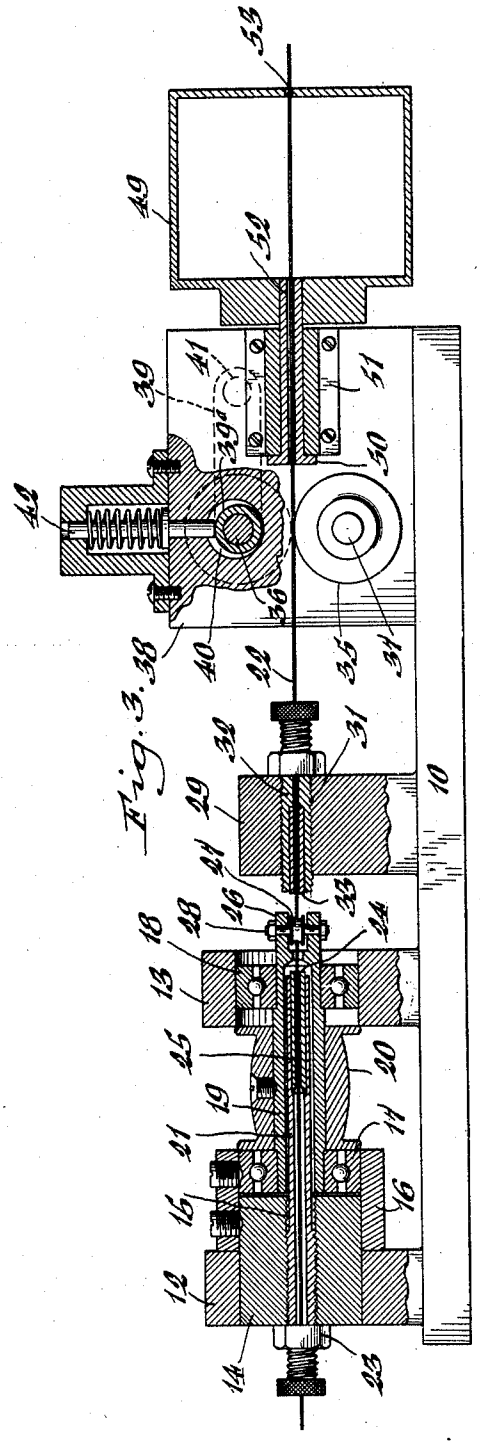


Fig. 3.

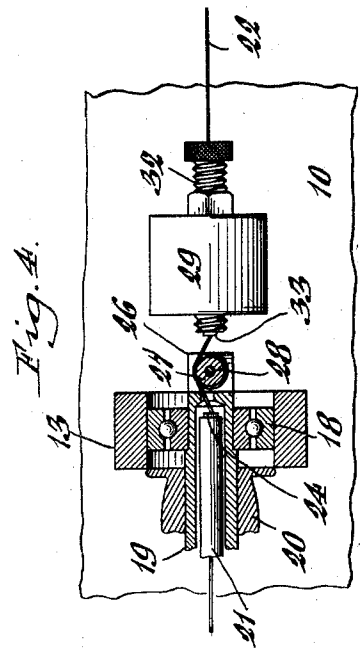


Fig. 4.

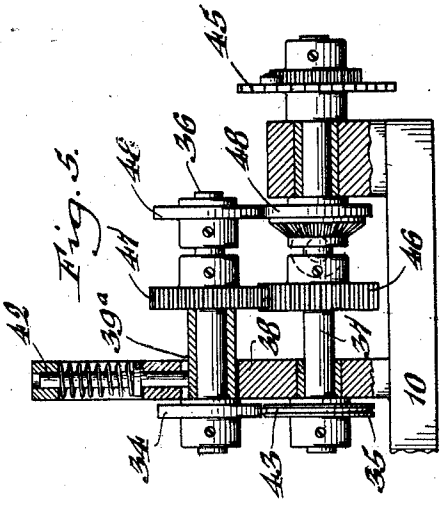


Fig. 5.

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UNITED STATES PATENT OFFICE

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WIRE STRAIGHTENING MACHINE

Application filed February 21, 1931. Serial No. 517,461.

This invention relates generally to wire treating machinery but more particularly to a machine for straightening wire.

One of its objects is to provide a simple and automatic machine of this character which will effectually and efficiently straighten the wire in a minimum period of time and with a minimum of power.

Another object of the invention is the provision of a wire straightening machine which is compact and inexpensive in construction, which requires a comparatively small floor space, and which is composed of few parts and not liable to get out of order.

In the accompanying drawings:—

Figure 1 is a side elevation of the wire straightening machine embodying my invention. Figure 2 is a top plan view thereof. Figure 3 is an enlarged longitudinal section taken on line 3—3, Figure 2. Figure 4 is an enlarged fragmentary horizontal section taken on line 4—4, Figure 1. Figure 5 is an enlarged transverse vertical section taken on line 5—5, Figure 2.

Similar characters of reference indicate corresponding parts throughout the several views.

Referring now to the drawings, 10 indicates the bed or table of the machine which supports its working parts and which may be mounted on legs 11. Mounted on this table at the feed or left hand end thereof are longitudinally spaced bearing blocks or supports 12 and 13, the block 12 including a core member or bushing 14 containing an internally-threaded axial opening 15 and a collar 16 mounted on the inner end of said member. Journaled in bearings 17 and 18 seated, respectively, in the collar 16 and the block 13 is a hollow shaft 19 having a drive pulley 20 fixed thereon which is adapted for connection by a belt (not shown) to a source of power for driving this shaft at a high speed, say approximately 20,000 R. P. M.

Fitted in the threaded bore of the core member 14 and extending freely for some distance into the hollow shaft 19 is a normally stationary adjustable tubular stem 21 through which the wire 22 to be straightened passes and which is held in its adjusted set position by a lock-nut 23. The inner end of this stem is preferably fitted with a plug 24 having a bore 25 of substantially the diameter of the wire being straightened. The hollow shaft which is held against endwise movement relative to the adjustable stem 21, projects beyond the bearing block 13 and terminates in a forked end 26 in which is arranged a freely revolving guide or straightening roller 27 for the wire. This roller is mounted on a transverse pin 28 disposed at right angles to the shaft-axis to rotate in the direction of length thereof, its position otherwise being permanent and never changes.

The numeral 29 indicates a block rising from the table 10 alongside the bearing block 13 and having a threaded bore 31 into which is fitted a tubular stem 32 containing a bored plug 33, similar to that extending through the hollow shaft 19. The straightening roller 27 is disposed substantially centrally between the opposing ends of the wire guiding stems 21 and 32 and as the wire passes from one stem to the other it is deflected tangentially out of its straight course, thereby tensioning the wire somewhat and resulting in its being effectually straightened while being revolved at a high rate of speed by the roller-bearing shaft 19.

At the right hand end of the machine is a suitable mechanism for feeding the wire therethrough, this mechanism preferably consisting of upper and lower feed rollers 34, 35 between which the wire is passed and by which it is constantly and uniformly pulled through the machine. These feed rollers are mounted on upper and lower transverse shafts 36, 37, the lower shaft 37 being journaled in a bearing plate 38 rising from the table 10 and the upper shaft being journaled in a bearing arm 39 having a hub 39ª extending freely through an opening 40 in said plate and fulcrumed at 41 to swing vertically and accordingly permit the upper feed roller 34 to have a restrained movement toward and from the companion lower roller 35. A spring-pressed follower bar or member 42 serves to constantly urge the upper roller into firm frictional contact with the periphery of the lower roller, the latter having a

peripheral groove 43 therein which acts to guide the wire 22 in a straight course through the machine.

Motion is transmitted to the feed rollers in any appropriate manner, that shown in the drawings consisting of a drive chain 44 connected to a source of power preferably independent of that used for the shaft 19 and engaging a sprocket 45 applied to the lower roller-shaft 37, which latter also has a gear 46 meshing with a similar gear 47 on the upper roller-shaft 36. Also applied to these shafts are distance wheels or disks 48 which cooperate to maintain the gears in proper mesh. These feed rollers are driven at an approximate speed of 150 R. P. M.

From the feed rollers 34, 35, the wire is preferably presented to a cleaning device which consists of a revolving drum 49 having its stem 50 journaled in a bearing 51 applied to the plate 38. This stem has an axial passage 52 through which the wire passes into the drum and the end wall of the latter has an alining opening 53 through which the cleaned wire is passed, and thence is delivered to a shears for cutting the wire into desired lengths for use, for example, as flyer wires for spinning machines. In its side the drum has an opening for introducing and discharging the cleaning medium, which may be a powder or like substance, said opening being provided with a cover 54 normally held closed by a spring 55.

By this arrangement of parts, the wire fed through the machine is presented to the high-speed straightening roller 27 which keeps the wire constantly at a neutral point between bending and not bending and which touches every point of the wire, thereby positively insuring straightening of the wire its entire length. Adjustment of the machine to readily adapt it for straightening wires of different sizes is effected by moving the stems 21 and 32 toward and from the relatively fixed roller 27 to shorten or lengthen the straightening zone, a comparatively short zone being required for fine wire and longer zones for proportionately larger gage wires.

I claim as my invention:

1. A machine of the character described, comprising opposing wire-guiding means disposed in alining spaced relation lengthwise of the machine, a revolvable wire-guiding means interposed between said stationary guiding-means and including a shaft rotatable about the axis of said opposing wire-guiding means and projecting beyond one of the latter and terminating short of the companion one and having a freely rotating deflecting member at its free end rotatable about an axis at substantially right angles to that of the shaft for directing the wire out of its normal path, and means for feeding the wire through both of said guiding means.

2. A machine of the character described, comprising a hollow revolvable shaft, a wire-guide extending into the bore of said shaft and terminating short of its free end, a second wire guide disposed beyond said first guide in axial alinement therewith and in opposing spaced relation to the free end of the shaft, a roller mounted on the free end of the shaft and rotatable about an axis substantially at right angles to said shaft-axis and with which the wire is adapted to engage, and means for feeding the wire through said guides.

3. A machine of the character described, comprising a hollow revolvable shaft having an exposed free end and provided with a fork, a wire-guide extending into the bore of said shaft and terminating short of its free end, a second wire guide disposed beyond said first guide and in axial alinement therewith and with the shaft, a roller having a guide-groove in its periphery disposed in the fork at the free end of the shaft and rotatable about an axis substantially at right angles to said shaft-axis for directing the wire out of its normal straight path through said guides, means for effecting an adjustment of said wire guides axially thereof toward and from the roller and feed rollers for pulling the wire through said guides.

4. A machine of the character described, comprising a hollow revolvable shaft, a wire-guide extending into the bore of said shaft, a second wire guide disposed beyond said first guide and said shaft and in axial alinement with such parts, a part mounted on that end of the shaft opposing said second wire-guide for directing the wire out of its normal path of travel through the guides, feed rollers for pulling the wire through said guides, and a vertically-swinging arm carrying one of said feed rollers and including a spring for urging its roller in frictional contact with the companion roller.

5. A machine for straightening wire, comprising a revolvable shaft provided at one end thereof with a wire-engaging roller free to rotate about an axis intersecting that of the shaft, and wire-guiding means disposed fore and aft of said wire-engaging roller and mounted for movement axially of the shaft toward and from said roller to vary the angle of deflection of the wire between the roller and the opposing ends of the wire-guiding means.

6. A machine for straightening wire, comprising a pair of spaced supports, opposing wire-guiding means mounted on said supports in axially-spaced alinement and adjustable independently toward and from each other, a shaft rotatably mounted about one of said wire-guiding means and projecting beyond the free end thereof to occupy a relatively permanent position between the opposing ends of the adjustable wire-guiding means, and a straightening roller journaled on the

projected end of said shaft to revolve in a direction lengthwise thereof.

7. A machine for straightening wire, comprising a pair of spaced supports having alining threaded bores therein, opposing wire-guiding members mounted on said supports and having externally-threaded portions engaging said threaded bores, whereby said members are adjustable toward and from each other; a shaft substantially in line with said guide members and revolvable relatively thereto in a fixed plane, said shaft being hollow and telescopically fitted over one of said guide members and terminating at one end short of the companion guide member, bearing elements for said shaft disposed between said spaced supports, and a straightening roller mounted on said shaft between the opposing ends of the guide members and revolvable about an axis transversely of the shaft.

8. A machine of the character described, comprising a hollow revolvable shaft terminating at one end in an axially disposed slot forming a forked portion, a wire guide extending into the bore of said shaft and terminating short of its forked portion, a second wire guide disposed beyond said first guide and in axial alinement therewith and terminating short of the forked end of said shaft, a roller mounted in a permanently set position on the forked end of the shaft between the opposing ends of said wire-guides, and means for feeding the wire through said guides.

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