J. F. CULVER.

SCORING DEVICE.

APPLICATION FILED JUNE 9, 1920.

1,394,715. Patented Oct. 25, 1921.

Fig. 1.

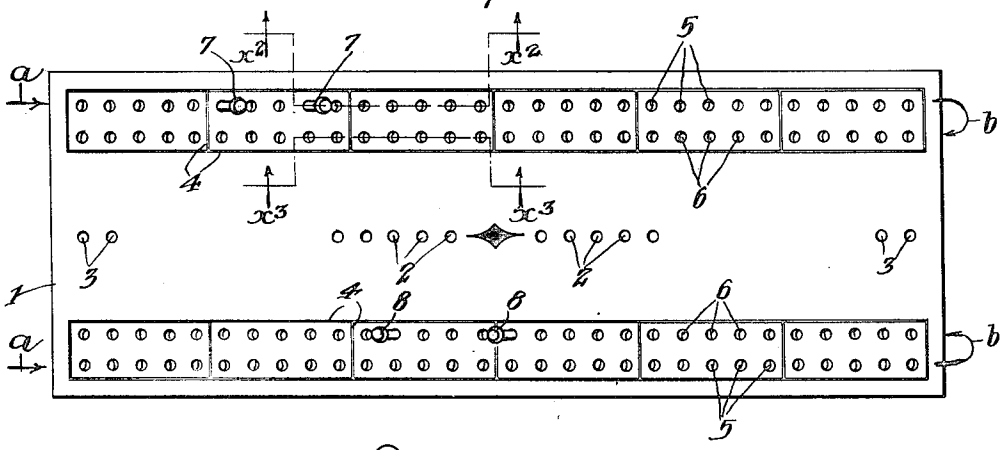


Fig. 2.

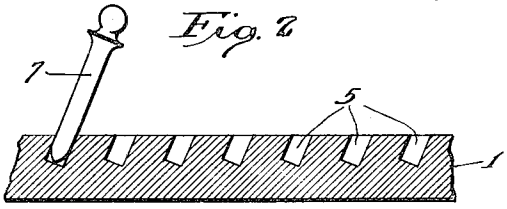
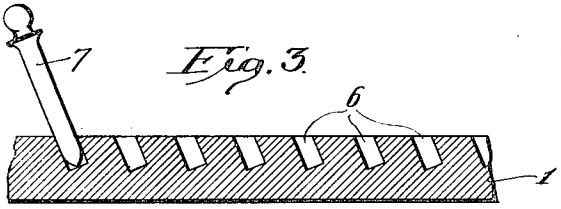


Fig. 3.



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J. B. DAVIES.

MACHINE FOR SPIRALLY THREADING OR GROOVING WIRE.

APPLICATION FILED AUG. 7, 1919.

1,394,716. Patented Oct. 25, 1921.

2 SHEETS—SHEET 2.

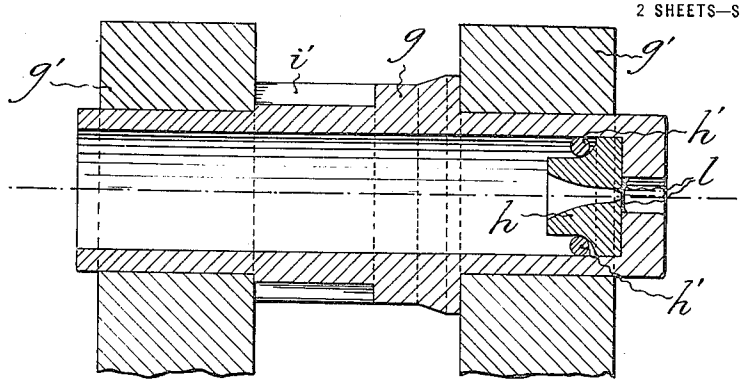


Fig. 3.

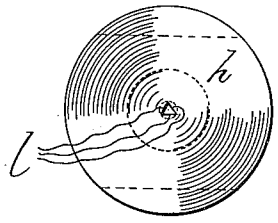


Fig. 4.

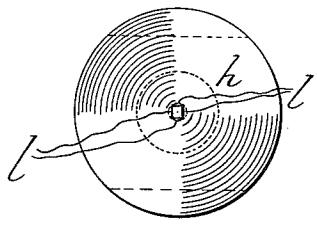


Fig. 5.

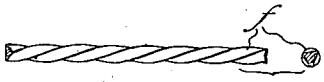


Fig. 4a.

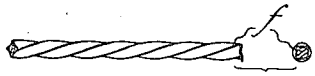


Fig. 5a.

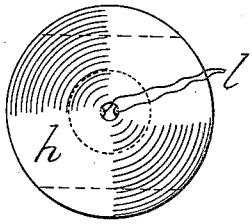


Fig. 6.

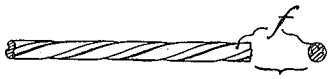


Fig. 6a.

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Attorney

UNITED STATES PATENT OFFICE.

JOSEPH BARTLETT DAVIES, OF MELBOURNE, VICTORIA, AUSTRALIA.

MACHINE FOR SPIRALLY THREADING OR GROOVING WIRE.

1,394,716. Specification of Letters Patent. Patented Oct. 25, 1921.

Application filed August 7, 1919. Serial No. 315,956.

To all whom it may concern:

Be it known that I, JOSEPH BARTLETT DAVIES, accountant, subject of the King of Great Britain, residing at 225–231 Queen street, Melbourne, in the State of Victoria, Commonwealth of Australia, have invented certain new and useful Improvements in Machines for Spirally Threading or Grooving Wire, of which the following is a specification.

This invention relates to improvements in machines for forming one or more grooves or flat sides or ribs helically around a wire and refers, especially to the formation of spirally threaded or grooved wire for use in the manufacture of nails, and for other purposes.

Hitherto it has been the custom to manufacture spirally threaded wire in one of the following ways viz., by twisting wire of angular cross section (such as square) by drawing it through a fixed die of a corresponding shape by means of a winding drum which is itself rotated on the axis passing through the die whereby the wire is twisted to the desired pitch as it leads on to the said drum or by forming a spiral thread around the wire (without twisting the same) by passing the wire between two or more rotating rollers or moving plates having their peripheries or faces as the case may be shaped to form a thread on the wire of a desired pitch, the said rollers either revolving around the wire or being prevented from so revolving.

The disadvantages of the first method are that it involves two separate operations, that is first drawing the wire to the required shape in cross section and secondly twisting the wire so drawn. The twisting operation strains and weakens the wire and in addition as a length or coil of wire is rarely of an uniform degree of hardness throughout, the softer portions are given a greater twist than the hard portions with the result that the twist or pitch of the thread is uneven. The disadvantage of the second method is that the mechanism employed is costly to manufacture and maintain and special dies must be employed to shape threads of different pitch even on wire of the same diameter, while in the cases where the rollers are prevented from rotating around the wire a rib or ridge is formed longitudinally on the wire.

The object of the present invention is to provide simple and efficient means whereby wire of ordinary round section may in one operation be provided with a spiral thread or groove of uniform pitch without twisting the same and without forming ridges longitudinally thereon.

The invention moreover comprises means for cleaning or removing any frayed edges or burs formed on the wire during the threading or grooving operation.

I accomplish the above mentioned object by providing means whereby a length or coil of wire is drawn from a bobbin or "swift" through a rotatable die onto a winding drum or drawing block in such a way that the wire will be drawn to the shape of the die and the rotation of the die will form one or more grooves or flat sides or ribs helically on the wire according to the shape of the said die and without twisting the said wire. A cleaning appliance is located between the die and the drawing block to remove any frayed edges or burs formed on the wire by the action of the die.

The die can be made to shape the wire to any approved section other than circular and the pitch of the grooves or flat or other shaped sides formed thereby is determined by the relative speed at which the die is rotated and the speed at which the wire is drawn therethrough. Means are provided for gripping the wire and guiding the same while feeding to the die and the gripping face of the die is made narrow to insure it forming a correct spiral on the wire without twisting the same between the said die and the drawing block.

In order that the invention may be readily understood reference will now be had to the accompanying sheets of explanatory drawings, wherein:—

Figure 1 is a view in elevation of an apparatus embodying the improvements comprised in the present invention, parts of the apparatus being shown broken away for convenience of illustrating purposes.

Fig. 2 is a view in sectional elevation of a die forming an essential feature of the appa-

ratus and shows a piece of wire as in the act of passing therethrough and with one end provided with helically formed ribs.

Fig. 3 is a view in sectional elevation of the die and the means for revolubly supporting the same.

Fig. 4 is a view in end elevation of a die adapted to impart a triangular section to a wire drawn therethrough.

Fig. 4ª is a view showing a piece of wire in side and end elevation as shaped by the die shown in Fig. 4.

Fig. 5 is a view in end elevation of a die adapted to impart a rectangular shape to a wire drawn therethrough.

Fig. 5ª is a view showing a piece of wire in side and end elevation as shaped by the die shown in Fig. 5.

Fig. 6 is a view in end elevation of a die adapted to impart oppositely disposed grooves in a wire drawn therethrough.

Fig. 6ª is a view showing a piece of wire in side and end elevation as shaped by the die shown in Fig. 6.

In these drawings the reference letter *a* has been employed to designate a frame upon one end of which is mounted a drawing block *b* of ordinary design driven by gearing *c* from a driving shaft *d* operated in any approved way. The opposite end of the frame *a* is designed to rotatably support a bobbin *e* for holding a coil of wire *f* or the said bobbin may be mounted independently of the frame altogether.

The frame of the machine between the bobbin *e* and the drawing block *b* is adapted to support a rotatable die carrying member *g* in one end of which is fitted a removable die *h*. The die carrying member *g* is adapted to receive its motion by a train of toothed gearing *i* from the driving shaft *d* and a pair or series of gripping rolls *j* are mounted on the frame between the die and the bobbin. The die carrying member is supported in bearings *g'* and its periphery is formed with gear teeth *i'* which are adapted to mesh with the teeth of one of the wheels of the gear train *i*. The rolls *j* act as guides for and prevent any tendency the wire may have to twist as it passes to the shaping die *h* and in order to facilitate the drawing operation the said wire can be passed through a lubricator *k* of approved design, mounted on the frame near the guide rolls.

The end of the wire *f* is passed from the bobbin *e* through the lubricator *k*, guide rolls *j* and die *h* and is secured to the drawing block *b* which is constructed in such a way as to prevent the wire mounting on itself and thereby increase the speed at which it is drawn through the die and so affect the pitch of the thread.

The die *h* is of somewhat similar construction to those commonly used for drawing wire and the opening therein may be of any section different from that of the wire to be operated upon.

The working or engaging parts *l* of the die *h* are made narrow and grip only a small part of the wire thereby enabling the spirals to be formed on the wire without twisting the same in the slightest degree.

The working or engaging parts *l* of the die are shown somewhat exaggerated in size in Figs. 2 and 3 of the drawings with a view to drawing particular attention to this feature of construction.

The die carrying member is tubular in form and the die *h* is inserted in one end thereof and retained fixedly in position therein by means of pins *h'*.

The ratio of the speeds of the drawing block *b* and the die *h* is maintained uniform when imparting a thread of particular pitch to the wire and by varying their respective speeds threads of different pitch can be formed on the wire without changing the die.

The die *h* is revolved in a plane at right angles to the forward movement of the wire *f* and the shape of the opening of the die is imparted to the wire in a spiral form, the pitch of the spiral or thread depending entirely upon the relative speeds of the wire and the said die. The wire is drawn straight through the die *h* and is not twisted or rotated, the helical grooves, flat sides or ribs being formed by the rapid rotation of the die.

The gearing *c* for imparting motion to the drawing block *b* and the gearing *i* for imparting motion to the die carrying member *g* are capable of adjustment to permit of variation of relative speeds so that the pitch of the groove or flat faces or ribs formed in or on the wire can be varied as required.

The speed of the die *h* can be varied relatively to that of the drawing block *b* to produce grooves or ribs of different pitch by interchanging some of the gear wheels in the gear train *i* or by substituting a wheel or wheels of different sizes for any of the said wheels.

If necessary, in order to remove any ragged edges or dirt left on the wire after the same has passed through the die the wire is passed between flexible members as wire brushes *m* or the like which are pressed against the wire by springs *n* and these brushes may be arranged to revolve automatically in conformity with the screw thread to effectually brush off all ragged edges or burs formed on the wire during the drawing operation.

I claim—

1. In a machine for forming helical threads or grooves on round wire, a drawing die having an aperture other than circular in shape provided with narrow bearing faces disposed in a plane at right angles to the

axis of the said die, and means for rotating said die.

2. In a machine for forming helical threads or grooves on round wire, a drawing die having an aperture other than circular in shape, a flared entrance to and narrow bearing faces on the inner wall of the aperture of the die, said narrow bearing faces being disposed in a plane at right angles to the axis of the die, gearing for imparting rotation to the die, and a rotatable drawing block operated synchronously with the die to draw the wire therethrough substantially as described.

3. In a machine for forming helical threads or grooves on round wire, a drawing die having an aperture other than circular in shape, a flared entrance to and narrow bearing faces on the inner wall of the aperture of the die, said narrow bearing faces being disposed in a plane at right angles to the axis of the die, a rotatable holder for the die, a rotatable drawing block operated synchronously with the die to draw the wire therethrough, and gearing for imparting rotation to the die and drawing block substantially as described.

4. A machine for forming helical threads or grooves on round wire comprising a frame, a drawing block rotatably mounted on the frame, a driving shaft and gearing for imparting motion to the drawing block, a die carrying member rotatably mounted in bearings on the frame and driven by gearing from the driving shaft, a drawing die fitted removably in the die carrying member and having an aperture other than circular in shape, a flared entrance to and narrow working faces formed on the inner wall of the aperture at the opposite end of the die, and means on the drawing block for engaging the wire to insure the same being drawn through the said die substantially as described.

5. A machine for forming helical threads or grooves on round wire comprising a frame, a drawing block and a spool rotatably mounted on opposite ends of the frame, a driving shaft and gearing for imparting motion to the drawing block, a die carrying member rotatably mounted in bearings on the frame between the spool and drawing block, gearing operated from the driving shaft for imparting rotation to the die carrying member, a drawing die fitted removably in the die carrying member and having an aperture other than circular in shape, a flared entrance to and narrow working faces formed on the inner wall of the aperture at the opposite end of the die, gripping means on the drawing block for engaging the end of the wire drawn through the die, and flexible members interposed between the die and the drawing block for removing burs formed on the wire during its passage through the said die substantially as described.

In testimony whereof I have affixed my signature in the presence of two witnesses.

JOSEPH BARTLETT DAVIES.

Witnesses:
WILLIAM A. ASHTON,
WM. BONNERUP.