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C. J. LANE.

DIE FOR COILING WIRE.

(Application filed May 3, 1899.)

(No Model.)

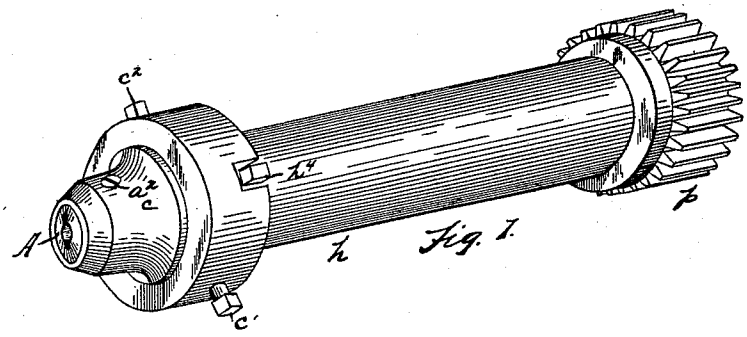


Fig. 1.

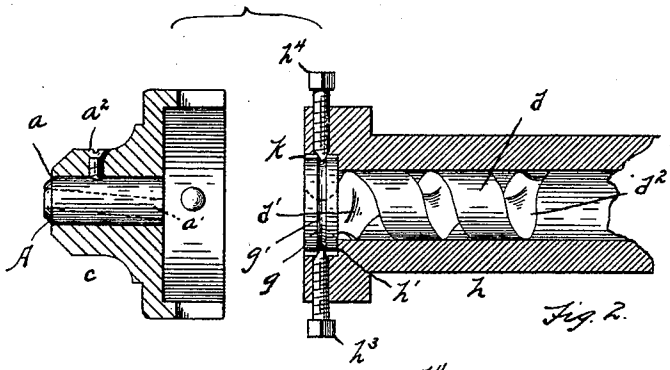


Fig. 2.

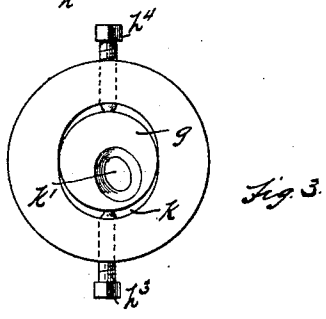


Fig. 3.

WITNESSES
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CORNELIUS J. LANE, OF HOLLY, MICHIGAN.

DIE FOR COILING WIRE.

SPECIFICATION forming part of Letters Patent No. 640,670, dated January 2, 1900.

Application filed May 3, 1899. Serial No. 715,448. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS J. LANE, a citizen of the United States, residing at Holly, county of Oakland, State of Michigan, have invented a certain new and useful Improvement in Dies for Coiling Wire; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to dies for coiling wire, and has for its object an improved attachment to the die of a wire-coiling machine through which wire is forced to produce a spiral, the object of the attachment being to adjust the die to produce a coiled wire of the desired pitch.

The finished product produced by the use of this die is not, strictly speaking, a coiled wire, inasmuch as the wire is simply bent and takes the shape which an ordinary coiled wire has, but is not in reality either wound around a mandrel or coiled, in the ordinary sense of the term. The wire enters the die on a line that is along the axis of the finished spiral and is forced into shape as a spiral of uniform pitch and uniform diameter. It has been found experimentally, however, in using the die of wire-coiling machines that after a little use that end of the die at which the wire enters begins to wear at the mouth of the spiral part of the die and that with the change in shape, due to the wearing off of a part of the die, the spiral changes pitch, and as the die wears more the change of pitch becomes greater, and while the pitch is regular or practically regular for a short period of time if two sections of the wire be taken, one of which was made after an interval of some hours' use of the machine, the two pieces will differ in pitch. This could be regulated in some degree by changing the gearing by which the die is rotated; but such regulation was not found to be sufficient, and it was found desirable to have some means of finer adjustment.

The embodiment of this invention is found in the following-described machine, which produces all the desired results.

In the drawings, Figure 1 is a perspective showing the outside of the die. Fig. 2 is a longitudinal sectional elevation of the case or outer part of the die and an elevation of the inner or grooved part of the die. Fig. 3 is an end view in elevation of the forming part of the die.

The die is made in the hollow hub of a pinion p. At one end of the hub h is a guide-cap c, having a central perforation a, in which is fitted a hardened leader A, having a hole through it, the hole commencing at the outer end and is there concentric with the die-cap and passes to the other end of the leader, where its exit a' directs the wire to the die-core. The leader A is held in place by a set-screw a^2, and the cap c engages over the end of the hub h and is held to the hub by set-screws c' and c^2. Within the hollow hub h is a spirally-grooved die-core d. The spiral groove around the die-core d has a varying pitch between its receiving end d' and its delivery end d^2. This die-core is held rigidly in the hub by set-screws. (Not shown.) The diameter of the groove is always larger than the wire to be treated, and accuracy in the pitch of the spiral wire cannot be attained by relying wholly on a groove of correct pitch at the delivery end of the die. The mouth or receiving end of the grooved die must have the wire guided into it at just the right place or the desired results will not be produced, which accurate guiding is produced by an adjustable guide-plate g, which engages in the socket k, larger than the guide-plate, and the guide-plate rests against an annular shoulder h'. Preferably the socket k is slightly oval, with its short diameter equal to that of the guide-plate g, and the guide-plate g is held in place by set-screws h^3 and h^4, and the points of the set-screws engage in a circumferential groove g', that surrounds the guide-plate g. There is a hole k' through the guide-plate, and this hole is eccentric to the center of the plate g, and the plate g may be adjusted to direct the wire led into it through the leader A so that the wire will strike the groove in the die d at the proper place to be bent to the proper pitch, and in case of wear in the mouth end of the grooved die the plate g can be readjusted readily to meet the

changed conditions, and such a readjustment may be as often as necessary and as accurate as may be desired. The plate *g* is not only adjustable around its center, thereby changing the position of the hole with reference to the mouth of the die, but is adjustable across the opening in which it engages.

The entire die is arranged as the hub or fixed shaft of a pinion which receives a rotary motion from some suitable source of power and revolves as the wire is pushed through it, the revolution of the die being sufficient to enable it to move along the spiral or (which is the same thing) to enable the spiral to move through it as it is formed in the same way that a nut moves along a screw, the spiral acting as a screw and the die acting as a nut.

What I claim is—

1. In combination with a die comprising a hollow cylinder having therein a spirally-grooved core, an adjustable guide-plate located at the entrance end, and having a guide-hole through said plate, eccentric to the center thereof, the said guide-plate being rotatable on its center, whereby the location of the guide-hole through it may be varied with respect to the core-die, substantially as described.

2. In a die having a spiral opening therethrough, a guide-plate located at the entrance of the said opening, and arranged to be turned concentrically, and shifted sidewise, and means for holding the guide-plate, substantially as described.

3. In a die for bending wire to a spiral form, the combination of a die having a spiral hole cut through it, an adjustable guide-plate located at the entrance end of the die, and means for holding the guide-plate, substantially as described.

4. In combination with a die, provided with a spiral hole cut through it, a wire-leader arranged to be held to the die, and an adjustable guide-plate between the leader and the entrance end of the die, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

CORNELIUS J. LANE.

Witnesses:

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