

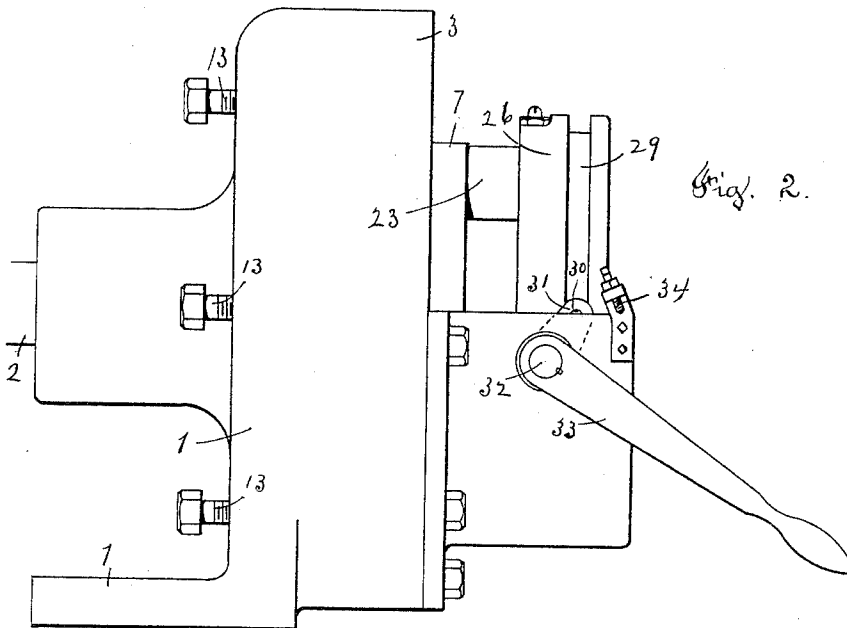
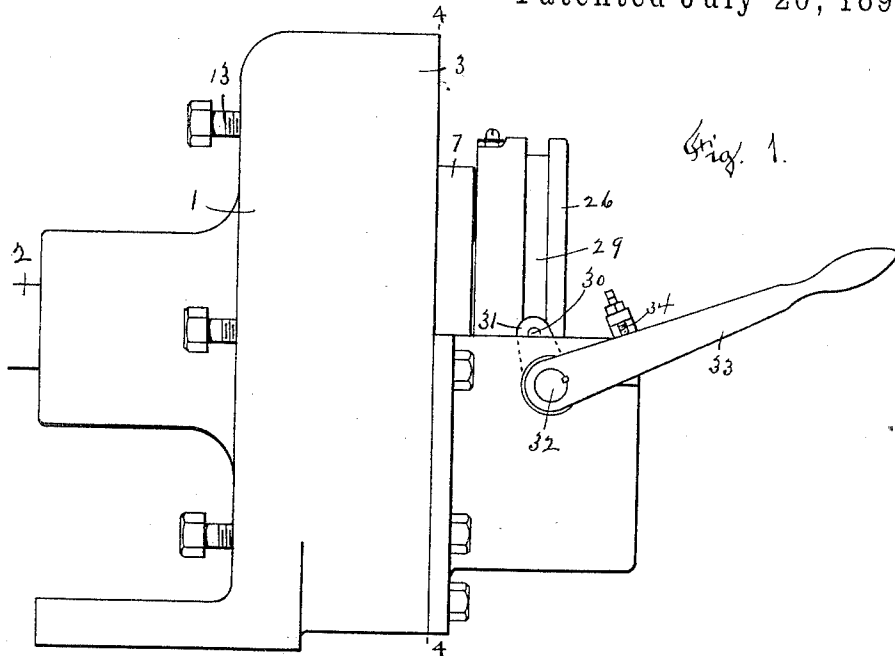
(No Model.)

3 Sheets—Sheet 1.

L. COOK.
WIRE SWAGING MACHINE.

No. 586,680.

Patented July 20, 1897.



Witnesses
Al Whiting.
Emma Hester.

Inventor
LeRoy Cook
By his Attorney
Rufus D. Fowler

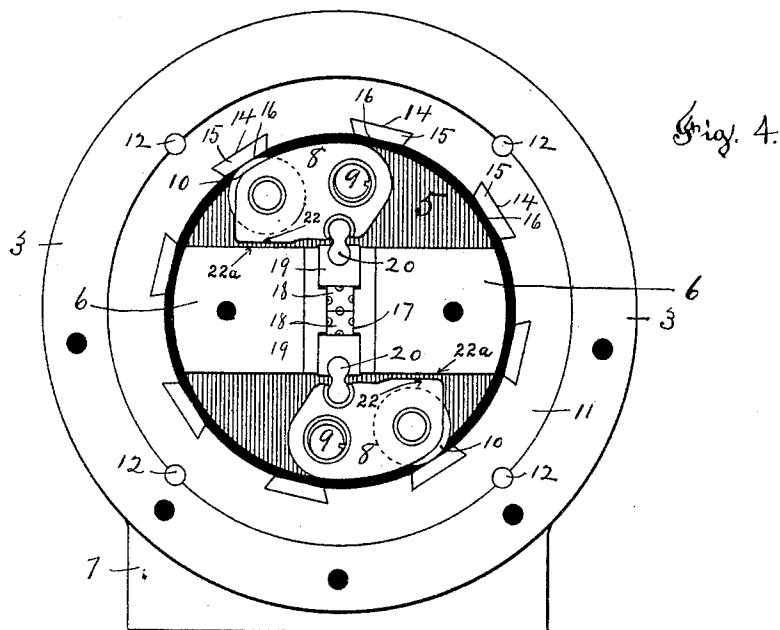
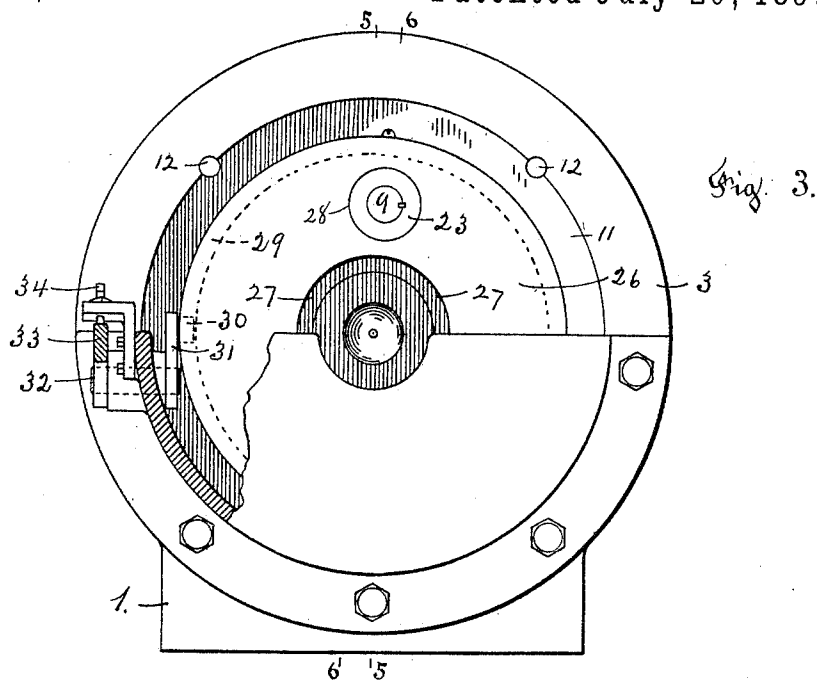
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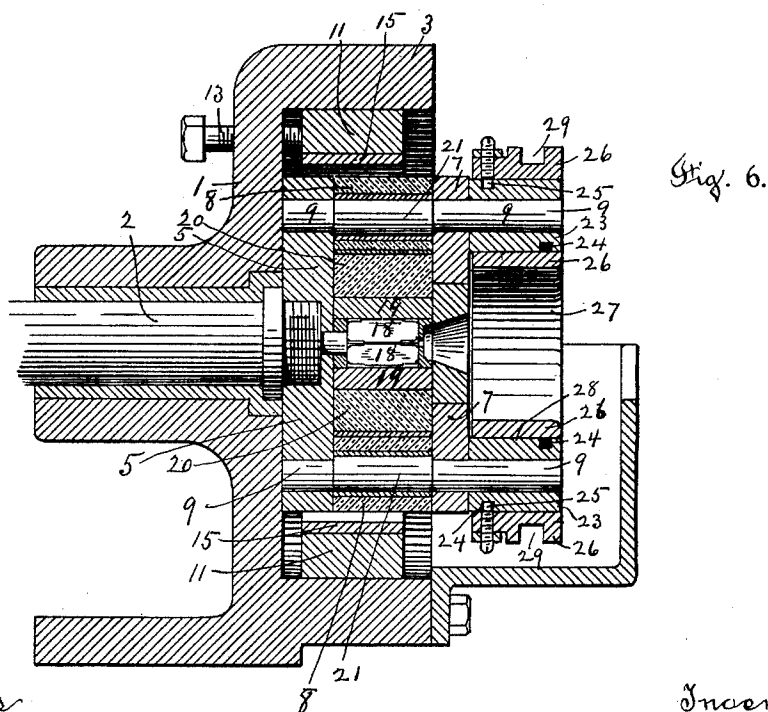
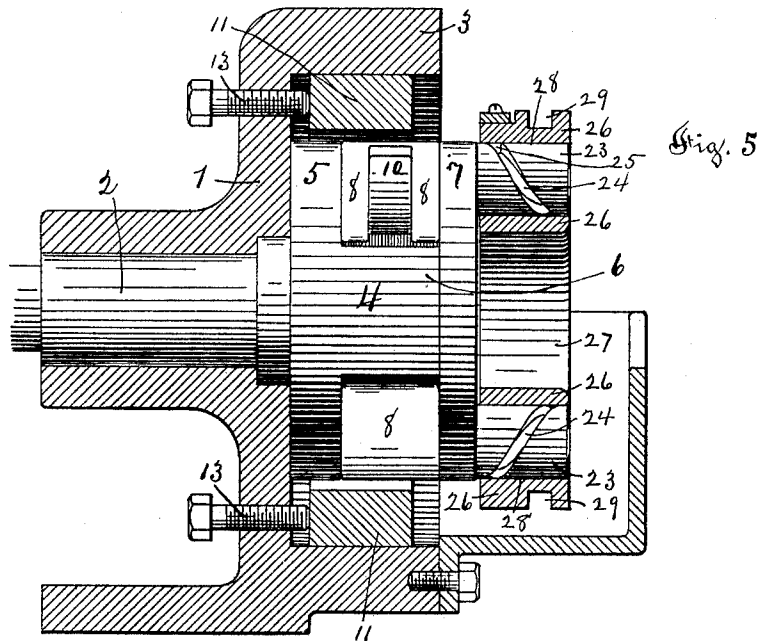
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UNITED STATES PATENT OFFICE.

LEROY COOK, OF WORCESTER, MASSACHUSETTS.

WIRE-SWAGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 586,680, dated July 20, 1897.

Application filed October 28, 1895. Serial No. 567,061. (No model.)

To all whom it may concern:

Be it known that I, LEROY COOK, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Wire-Swaging Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, in which—

10 Figure 1 represents a side view of a portion of a wire-swaging machine embodying my invention, showing its lever-handle in a raised position. Fig. 2 represents the same view as shown in Fig. 1, but with the lever-

15 handle in a depressed position. Fig. 3 is an end view of the swaging-machine with a portion of the oil-retaining apron broken away. Fig. 4 is an end view with the oil-retaining apron and sliding ring by which the eccentric spindles are rotated removed, the re-

20 moval of the parts mentioned disclosing a view of the rotating head on the plane of the line 4 4, Fig. 1. Fig. 5 is a central sectional view of the shell or case inclosing the rotating head on the line 5 5, Fig. 3, showing the rotating head and parts carried thereby in full; and Fig. 6 is a vertical sectional view on line 6 6, Fig. 3.

Similar numerals refer to similar parts in the different figures.

My present invention relates to that class of wire-swaging machines which comprise a pair of swaging-dies carried by a rotating head and having means whereby the dies are

35 intermittently crowded together against the wire which is inserted between them and held concentrically with the rotating head; and it has for its object to provide means whereby the action of the swaging-dies can

40 be increased or diminished at will by the operator and also to allow the dies to be opened for the insertion of the wire.

In the accompanying drawings I have shown such portions of a wire-swaging machine as are necessary to illustrate the nature of my present invention and the method of carrying the same into effect.

Referring to the drawings, 1 represents a portion of the supporting-framework, in which is journaled a revolving shaft 2. That

50 portion of the framework represented in the drawings comprises a case or shell formed by

the flange 3 and inclosing a cylindrical chamber containing the rotating head 4, which is carried by the shaft 2, and comprises a circular plate 5, having a rib 6, to which the front circular plate 7 is attached. The plates 5 and 7 inclose spaces between them, in which are pivoted levers 8 8 upon spindles 9 9, which are journaled in the plates 5 and 7. The free ends of the levers 8 8 carry rolls 10 10, which as the head is rotated are carried around in contact with the inner surface of the ring 11, which is held within the flange 3 and kept from rotation by means of the splines 12. Screws 13 are held in the frame and bear against the rear edge of the ring 11 in order to change its position within the flange 3. As the rotating head is rapidly revolved the free ends of the levers 8 8 are thrown outward by centrifugal force, thereby holding the rolls 10 10 in contact with the inner surface of the ring 11.

The ring 11 is provided with a series of equidistant transverse dovetailed grooves 14, in which are inserted the cam-plates 15, having their inner surfaces 16 forming the chords of an arc coinciding with the curvature of the inner surface of the ring 11, so that as the rolls 10 10 pass over the surfaces 16 of the cam-plates the free ends of the levers will be pushed inward and the levers rocked slightly upon the spindles 9 9. The rib 6 is provided with a diametrical slot 17, forming ways for the swaging-dies 18 18 and the pressure-

85 blocks 19 19.

Links 20 20, provided with rounded ends which are inserted in semicircular notches in the levers 8 8 and in the pressure-blocks 19 19, serve to operatively connect the pressure-blocks with the levers 8 8 as the rolls 10 10 pass over the surfaces 16 of the cam-plates will cause the pressure-blocks 19 and dies 18 to be carried toward each other and against the wire which is inserted between the swaging-dies, thereby swaging the wire by a series of compressions as the rolls 10 pass successively over the surfaces 16 of the cam-plates 15, the centrifugal force of the rotating parts, as the head 4 is revolved, throwing the free ends of the levers outward between each of the cam-plates and holding the rolls 10 in contact with the inner surface of the ring 11.

The ring 11 is capable of sliding within the

flange 3, and as the inner surfaces 16 of the cam-plates become worn by continued use the ring 11 is moved forward by advancing the adjusting-screws 13 far enough to bring

a new surface into contact with the rolls 10.
 The spindles 9 9, upon which the levers 8 8 are pivoted, are journaled in the plates 5 and 7, and the section 21 of the spindles contained between the plates 5 and 7 and upon which the levers are pivoted is slightly eccentric to that portion of the spindles journaled in the plates 5 and 7, so that the rotation of the spindles 9 will move the axis of the levers 8 toward or away from the center of the rotating head, thereby varying the fulcrums of the levers 8 and changing the radial movement of the swaging-dies within their ways as the rolls 10 move over the cam-plates 15, the parts being so arranged that when the spindles 9 are turned so as to bring the fulcrums of the levers 8 nearest the center of the head the opposing faces of the swaging-dies will be brought into contact, and when the spindles are rotated one-half a revolution, carrying the fulcrums of the levers 8 farthest from the center of the rotating head, the swaging-dies will be opened far enough to allow the insertion of the wire between them, and the amount of compression produced by the dies will be varied by an adjustment of the spindles 9 9 between these two points. When the wire inserted between the swaging-dies has been sufficiently reduced in diameter, the operation of swaging is interrupted by rotating the spindles 9 9 so as to carry the fulcrum of the levers 8 farthest from the center of the rotating head, so the rocking motion of the levers as their free ends are moved in by the action of the cam-plates will be insufficient to bring the swaging-dies in contact with the wire. I have found, however, that as the levers are carried past the cams 15 by the rapid rotation of the head the free ends of the levers are liable to be thrown in by their momentum as the rolls 10 pass over the cam-surfaces 16, thereby throwing the dies against the surface of the finished wire and causing the wire to become marked by the slight blow of the dies. It is necessary, therefore, to limit the movement of the free ends of the levers 8 to that produced by the cam-surfaces themselves, checking the rocking motion of the levers due to the momentum of their free ends. I accomplish this result by providing the straight abutting surfaces 22 on the inner sides of the free ends of the levers 8 and opposite the abutting surfaces 22^a on the sides of the rib 6 with the normal space between said abutting surfaces just sufficient to allow the rocking motion of the levers 8 when their free ends are pushed in by the action of the cam 16, thereby limiting the movement of the free ends of the levers and preventing them from being unduly carried toward the center of the rotating head by momentum.

The outer ends of the spindles 9 9 project

beyond the front plate 7, and cylinders 23 are attached thereto provided with a spiral cam-slot 24 to receive the studs 25, held in the annular plate 26.

The annular plate 26 has a central opening 27 to allow the wire to be presented to the swaging-dies and the circular openings 28 28, which form a sliding bearing for the plate 26 upon the cylinders 23.

The annular plate 26 is provided upon its outer surface with an annular groove 29 to receive a stud 30, carried in a crank-arm 31, which is attached to a rocking shaft 32, journaled in the fixed portion of the machine and provided with a lever-handle 33, by which the shaft 32 is rocked, causing the annular plate 26 to slide upon the cylinders 23 and by the action of the studs 25 in the spiral slots 24 to rotate the spindles 9 9. When the swaging-dies are to be thrown apart for the insertion of wire, the lever-handle 33 is depressed, as represented in Fig. 2, thereby moving the annular plate 26 forward on the cylinders 23 and rotating the spindles 9 9, so as to move the fulcrums of the levers 8 the farthest from the center of the rotating head, and when the wire has been inserted and the machine is to be brought into operation the lever-handle 33 is raised, as represented in Fig. 1, moving the annular plate 26 toward the rotating head and turning the spindles 9 9, thereby carrying the fulcrums of the levers 8 toward the center of the rotating head and bringing the swaging-dies nearer together.

The angular movement imparted to the spindles 9 9 by raising the lever-handle 33 is limited and determined by the adjusting-screw 34, which is held by the framework of the machine in the path of the lever-handle 33, thereby allowing the swaging action of the dies to be increased or diminished or completely interrupted at the will of the operator without requiring any change in the relative position of the rotating head 4 or the cam-plates 15.

I do not confine myself to the specific construction as shown of swaging-dies and actuating-levers so far as the means for varying the action of the swaging-dies is concerned, as the means embodying my invention only require that the die-actuating mechanism shall comprise a member having a fulcrumed bearing upon the rotating head.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for swaging wire the combination with a rotating head and swaging-dies carried by said head, of spindles journaled in said head, levers operatively connected with said dies and pivoted on said spindles between their journaled bearings, with the axis of said levers eccentric to the axis of said journaled bearings, means for rocking said levers on said spindles and means for rotating said spindles, whereby the fulcrums of said levers are varied, substantially as described.

2. In a machine for swaging wire the combination with a pair of swaging-dies, of a pair of rocking levers operatively connected with said dies and pivoted on rotating spindles eccentrically to their axis of rotation, rotating spindles held in journaled bearings eccentrically to the axes of said levers and means for rotating said spindles, substantially as described.

3. In a machine for swaging wire, the combination with a rotating head and ring concentric with and inclosing said head, and provided with a series of cam-surfaces, of swaging-dies carried by said rotating head, levers fulcrumed on said head and operatively connected with said dies, rolls carried by the free ends of said levers, in contact with said ring and said cam-surfaces and means for changing the fulcrums of said levers, whereby the swaging action of said dies is varied, substantially as described.

4. In a swaging-machine, the combination with a rotating head and shell or case inclosing said head, of swaging-dies carried by said head, spindles journaled in said head, levers pivoted on said spindles eccentrically to the axis of said spindles and operatively connected with said dies, means for intermittently rocking said levers, cylinders attached to said spindles and provided with spiral slots, a sliding plate carrying studs entering said slots and means for moving said plate, whereby said spindles are rotated and the fulcrums of said levers changed, substantially as described.

5. In a wire-swaging machine, the combination with swaging-dies actuating-levers operatively connected with said dies, said levers being pivoted upon spindles eccentrically to their axes, cylinders carried by said spindles and provided with cam-slots, a sliding plate, studs carried by said sliding plate and entering said cam-slots and a pivoted lever-handle operatively connected with said sliding plate, substantially as described.

6. In a machine for swaging wire, the combination of a pair of swaging-dies, mechanism

for actuating said dies and comprising a fulcrumed member and means by which the fulcrum of said actuating member is changed, and the action of said dies is thereby varied at will, substantially as described.

7. In a machine for swaging wire the combination with a framework provided with a flange inclosing a cylindrical chamber, of a ring held within said flange and capable of sliding in a line parallel with its axis and provided with cam-surfaces, a rotating head concentric with said ring, swaging-dies held in said head, die-operating mechanism carried by said head and arranged to be acted upon by said cam-surfaces and means for sliding said ring within said flange in a line parallel with its axis, substantially as described.

8. In a machine for swaging wire, the combination with a pair of swaging-dies of a lever operatively connected with one of said swaging-dies and pivoted at one end on a spindle, a spindle forming the pivot of said lever and journaled in bearings eccentric to the axis of said pivoted lever, means for rocking said lever on said spindle, and means for rotating said spindle in order to change the fulcrum of said lever, substantially as described.

9. In a machine for swaging wire, the combination with a pair of swaging-dies, of a lever pivoted at one end and operatively connected with one of said swaging-dies, means applied to said lever to rock the same on its pivot, an abutting surface on said lever opposite its pivoted end, a fixed opposing abutting surface with the normal space between said abutting surfaces just enough to allow the rocking motion of said lever to actuate said die, and means for varying the position of the pivot of said lever whereby it is thrown out of action, substantially as described.

Dated this 17th day of October, 1895.

LEROY COOK.

Witnesses:

RUFUS B. FOWLER,
EMMA KESTER.