

(No Model.)

2 Sheets—Sheet 1.

E. W. VAUGHAN & E. J. WATSON.

WIRE SWAGING MACHINE.

No. 524,742.

Patented Aug. 21, 1894.

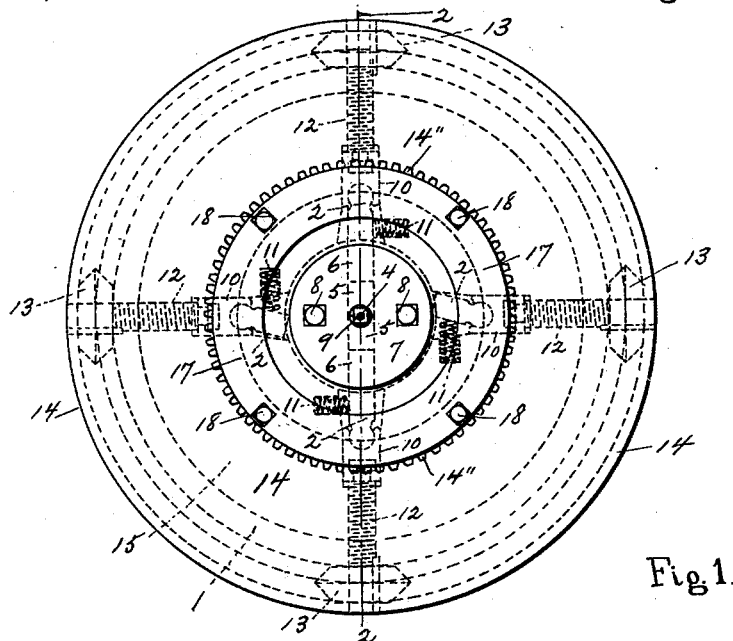


Fig. 1.

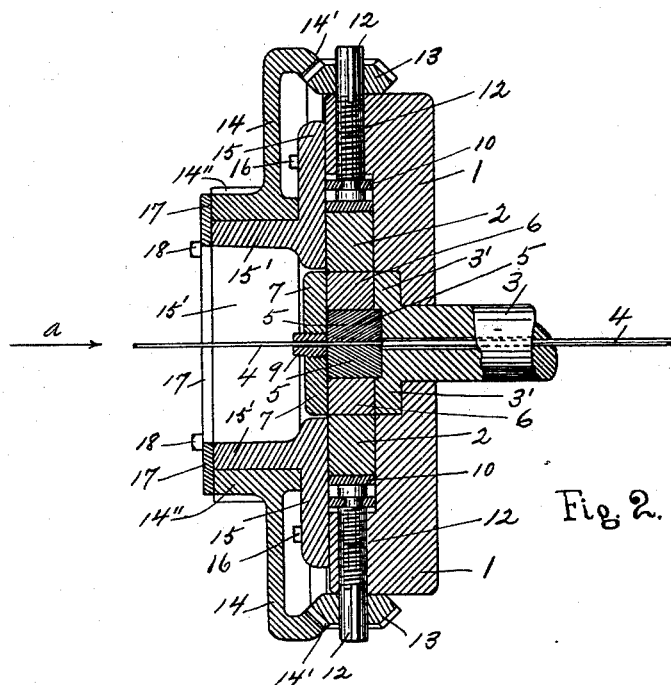


Fig. 2.

Witnesses

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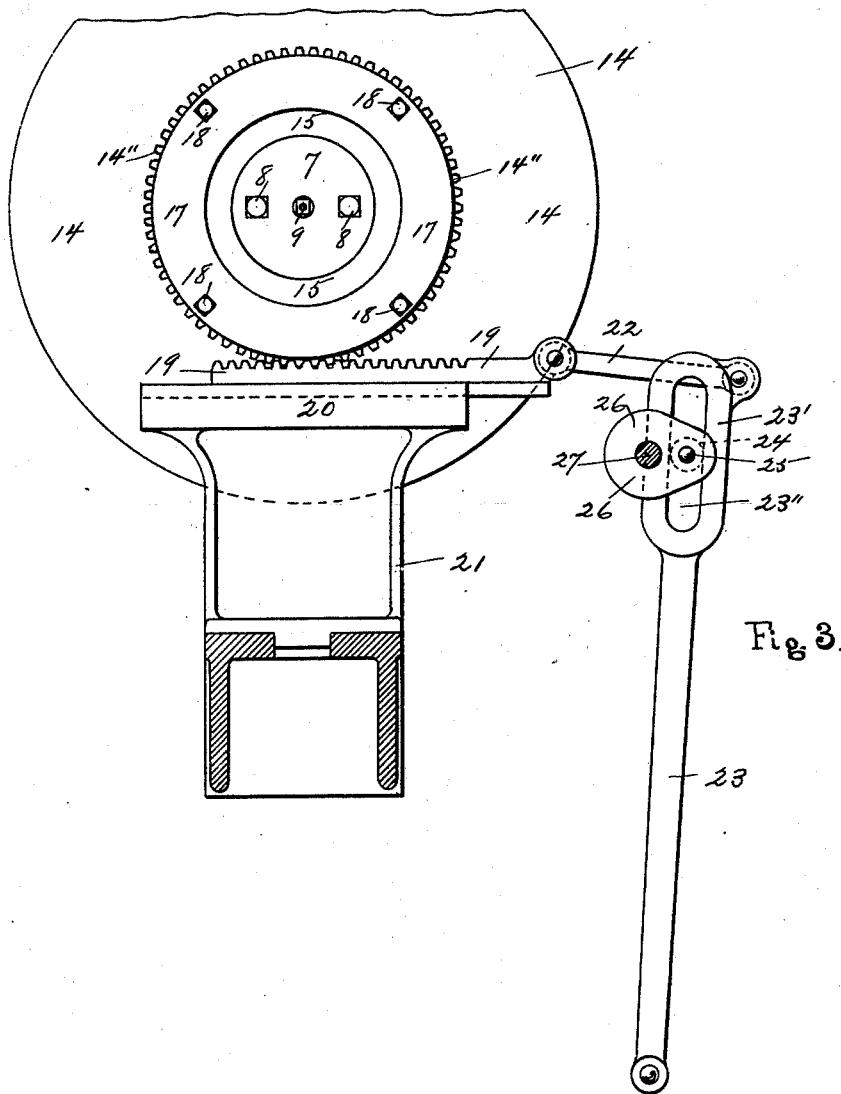
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UNITED STATES PATENT OFFICE.

EDWIN W. VAUGHAN AND EDWIN J. WATSON, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO THE WASHBURN & MOEN MANUFACTURING COMPANY, OF SAME PLACE.

WIRE-SWAGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,742, dated August 21, 1894.

Application filed December 4, 1893. Serial No. 492,761. (No model.)

To all whom it may concern:

Be it known that we, EDWIN W. VAUGHAN and EDWIN J. WATSON, both citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have jointly invented certain new and useful Improvements in Swaging-Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which our invention belongs to make and use the same.

Our invention relates to swaging machines, or to machines for swaging wire, and the object of our invention is to provide a swaging machine in which the swaging dies may be automatically closed, or moved toward each other in order to swage the wire, as it is drawn through the machine, and may be automatically opened, or moved away from each other, to allow the wire to be drawn through the machine without being swaged, all without stopping the machine.

Our invention consists in certain novel features of construction and operation of a swaging machine of the class above referred to, as will be hereinafter fully described.

We have shown in the drawings our invention applied to and combined with the swaging dies and operating mechanism, of substantially the description shown in United States Patent No. 52,493, of February 6, 1866.

Referring to the drawings:—Figure 1 is an end or face view of the swaging head, embodying our improvements, looking in the direction of arrow *a*, Fig. 2, showing some of the concealed parts by dotted lines. Fig. 2 is a central vertical section, on line 2, 2, Fig. 1, and Fig. 3 corresponds to Fig. 1, with the dotted lines left off, and showing the operating mechanism for automatically opening and closing the swaging dies.

In the accompanying drawings, 1 is a circular stationary shell, within which is supported a series of toggle blocks 2, in this instance four toggle blocks, constructed and arranged to operate to close the swaging dies, to swage the wire, and to return to their nor-

mal position, in substantially the same manner as shown and described in said patent.

The revolving shaft 3, driven by belt power, not shown, or otherwise, has a central longitudinal hole therein, through which extends the wire 4 to be swaged, and a head 3' thereon provided with a cross groove in which are supported the swaging dies 5, and the followers 6 adapted to bear on the outer surface of said swaging dies 5, and to be engaged by the inner ends of the toggle blocks 2. The swaging dies 5 and the followers 6 are retained in the cross groove in the head 3' to revolve therewith, by a plate 7, secured to the outer end of the head 3' by bolts 8, or otherwise. A short tube 9 is screwed into a central hole in said plate 7, through which tube the wire passes, as shown in Fig. 2.

In the stationary shell 1 are recesses which receive the toggle blocks 2, the inner ends of which are adapted to engage the followers 6 as the shaft 3, having the head 3' thereon carrying said followers 6 and the swaging dies 5, revolves.

The outer ends of the toggle blocks 2 are made circular, as shown by dotted lines, Fig. 1, to extend within corresponding recesses in the blocks 10. Springs 11 extend within cavities in the shell 1, and act to press the toggle blocks to one side of the recesses in which they are contained, so that as the shaft 3 and the head 3' revolve, and the followers 6 come in contact with the ends of the toggle blocks 2 successively, they move said toggle blocks to the right against the action of the springs 11, engaging the toggle blocks, as shown in Fig. 1, forcing inwardly the followers 6 and the swaging dies 5, to swage or hammer the wire 4 extending between said dies. As the shaft 3 and the head 3' continue to revolve, the followers 6 pass by the end of the toggle blocks 2 and the springs 11 act to move back said blocks to their normal position, as shown in Fig. 1, ready to engage the followers 6 when they come round again, all in substantially the manner as set forth in said patent referred to.

We will now describe our improvements, combined with the parts of the swaging ma-

chine above described, to automatically close the swaging dies, or move them toward each other preparatory to swaging the wire, and to automatically open the swaging dies, or move them away from each other, to allow the wire to be drawn through the machine without being swaged, all without stopping the machine.

Adjusting screws 12, one for each toggle block 2, are supported in the shell 1, and are connected at their inner ends with the blocks 10 to move said blocks out or in, according to the direction of rotation of the adjusting screws 12. When the blocks 10 are moved out by the adjusting screws 12, the toggle blocks 2 move outwardly to release them from engagement with the followers 6, and when the blocks 10 are moved inwardly, by the reverse rotation of the adjusting screws 12, the toggle blocks 2 are also moved inwardly to cause them to engage with the followers 6, which in turn engage with the swaging dies 5, to swage the wire as shown in Fig. 2. Splined to the outer ends of the adjusting screws 12 are small bevel gears 13, which mesh with and are driven by the bevel gear surface 14' on the gear 14. The gear 14 is loosely mounted, and adapted to revolve in either direction, on the projecting hub 15' on the plate 15. The plate 15 is secured to the face of the shell 1 by bolts 16 or otherwise, and serves to retain the blocks 10 and the toggle blocks 2 in position in the shell 1. A plate 17, secured by bolts 18, or otherwise, on the outer end of the hub 15' serves to retain the gear 14 on said hub. The gear 14 is provided with the external gear surface 14'' which meshes with and is driven by a rack 19 supported and adapted to have a reciprocating motion in ways 20 on the stand 21. The rack 19 is connected by a link 22 with the upper slotted end 23' of the lever 23, which is pivotally supported at its lower end. The upper end 23' of the lever 23 is provided with a slot 23'' in which travels a friction roller 24, on a pin 25 on the crank 26, fast on the driven shaft 27.

From the above description in connection with the drawings, the operation of our swaging machine will be readily understood by those skilled in the art.

By the rotation of the shaft 27, to which is communicated a regular intermittent rotation from any suitable driving mechanism, a reciprocating motion is communicated to the rack 19, through the crank 26, roll 24, lever 23, and link 22. Through rack 19 the gear 14 is rotated at regular intervals, first in one direction and then in the other.

The rotation of the gear 14 in one direction, through the gear surface 14' and gears 13, will turn the adjusting screws 12 in one direction, and cause the blocks 10 connected therewith to move outwardly to allow the followers 6, and swaging dies 5 to be moved apart or opened, for the free passage of the wire between said dies, without being acted on by

the same. The rotation of the gear 14 in the opposite direction will cause the adjusting screws 12 to be turned in the opposite direction, to move inwardly said screws, and the blocks 10 connected therewith, to cause the followers 6 and swaging dies 5 to be closed, or moved toward each other, to swage the wire as it passes between said dies, as shown in Fig. 2.

It will thus be seen, that we have provided a very simple and effective mechanism, automatically operated, and combined with the ordinary swaging mechanism of a swaging machine, for opening or moving apart the swaging dies, to allow the wire to be drawn through between the same without being swaged, and also to close or move toward each other the swaging dies, to cause the same to act on the wire to swage the same, as it is drawn through the machine, all without stopping the machine.

It will be understood, that the details of construction of some of the parts of our mechanism for automatically opening and closing the swaging dies, as above set forth, may be varied somewhat if desired.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a swaging machine, the combination with the swaging dies, and mechanism for actuating the dies to swage the wire, of mechanism for automatically opening or moving apart the swaging dies to allow the wire to pass between the same without being swaged, and for automatically closing or moving toward each other the swaging dies, to swage the wire, consisting of adjusting screws provided with gears adapted to engage a gear, and said gear, mounted and adapted to rotate on a hub on the stationary part of the swaging machine, and provided with a gear surface meshing with and operated by a reciprocating rack, and said reciprocating rack, and means for moving the same, substantially as shown and described.

2. In a swaging machine, the combination with the swaging dies, and mechanism for actuating the dies to swage the wire, of mechanism for automatically opening or moving apart the swaging dies, to allow the wire to pass between the same without being swaged, and for automatically closing or moving toward each other the swaging dies, to swage the wire, consisting of adjusting screws provided with gears, adapted to engage a gear, and said gear, mounted and adapted to rotate on a hub on the stationary part of the swaging machine, and means for rotating said gear, first in one direction, and then in the other, substantially as set forth.

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