(No Model.) 2 Sheets—Sheet 1.

J. BERRY.

MACHINE FOR GRINDING THE ENDS OF WIRES.

No. 324,641. Patented Aug. 18, 1885.

Fig 1

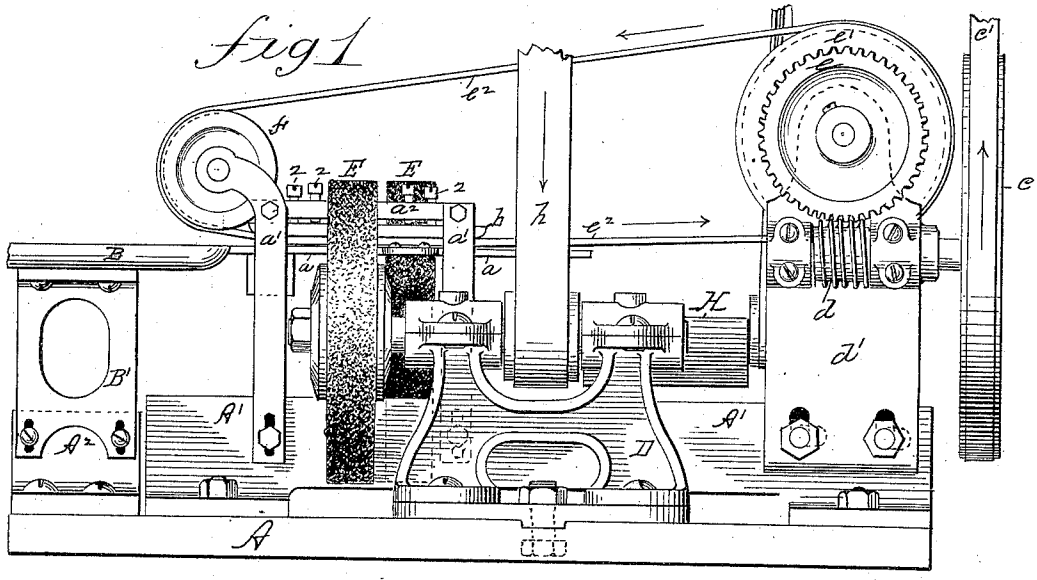
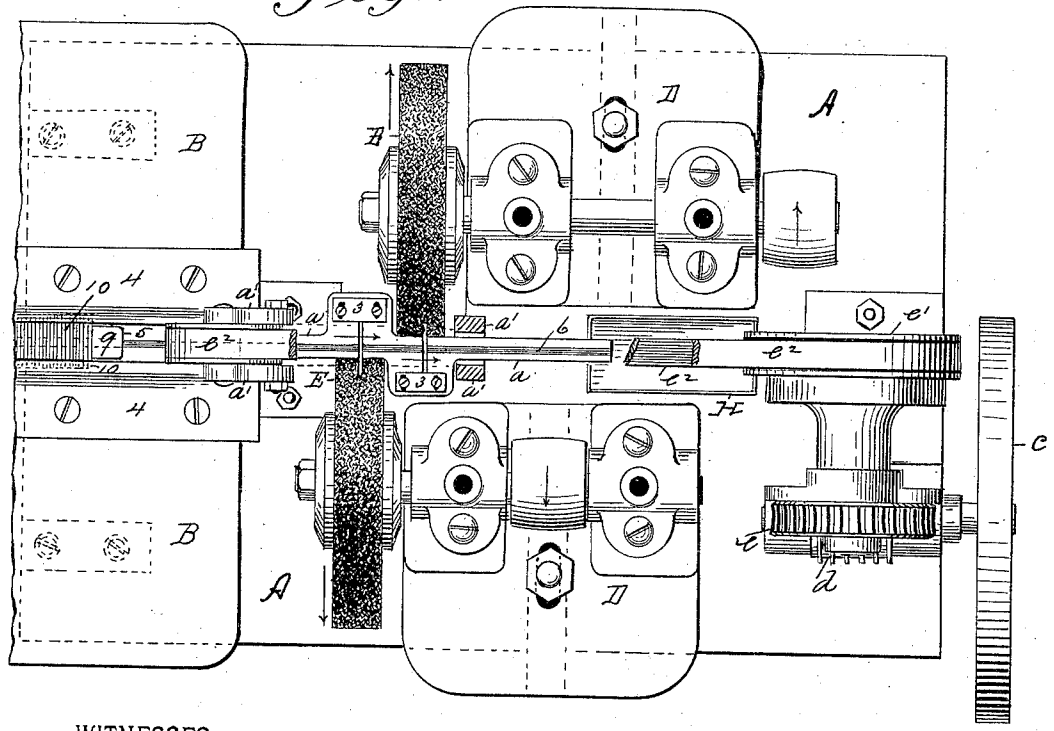


Fig 2



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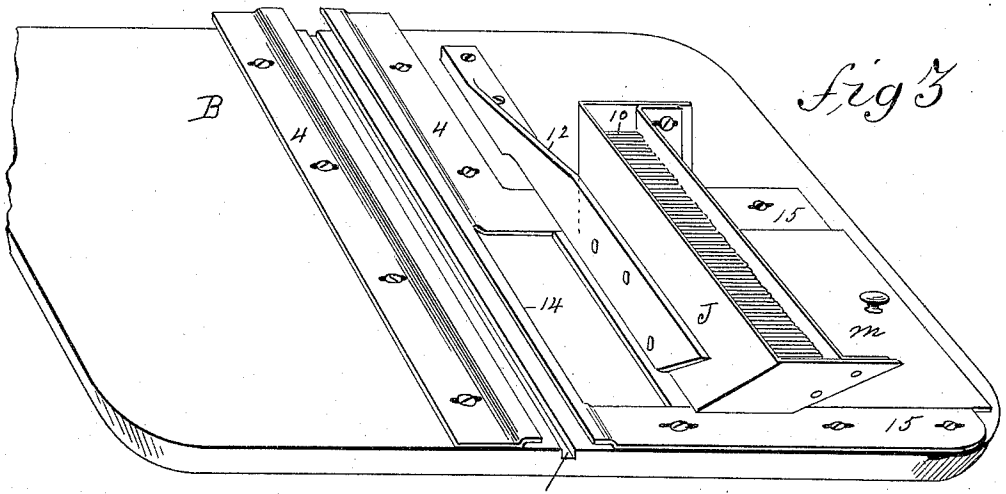


Fig 3

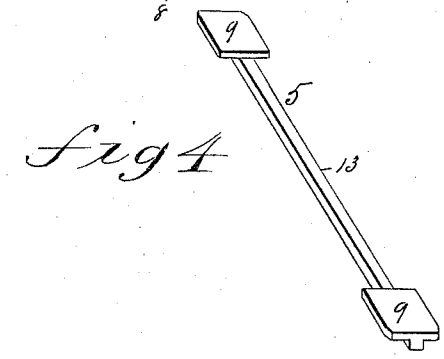


Fig 4

Fig 5



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UNITED STATES PATENT OFFICE.

JOHN BERRY, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO THE NATIONAL NEEDLE COMPANY, OF SAME PLACE.

MACHINE FOR GRINDING THE ENDS OF WIRES.

SPECIFICATION forming part of Letters Patent No. 324,641, dated August 18, 1885.

Application filed December 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN BERRY, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Grinding the Ends of Wires to a Conical Form, of which the following is a specification.

This invention relates to improvements in machines for removing the burr from the ends of needle-blanks which have been cut off from wire, and for grinding the ends of said blanks to a substantially uniform conical shape, the object being to provide improved mechanism for holding, moving, rotating, and controlling the blanks while their ends are being ground, to the end that the extremities of the blanks may be so shaped as to facilitate their subsequent formation into perfect needles by cold compression or swaging.

In the drawings forming part of this specification, Figure 1 is a side elevation of a machine for grinding the ends of needle-blanks to a cone shape, constructed according to my invention. Fig. 2 is a plan view partly in section. Fig. 3 is a view of the blank-table separate from the machine. Fig. 4 is a view of the blank-holder; and Fig. 5 is an enlarged view of a needle-blank, showing substantially the form which is given to its ends by the action of the machine.

Heretofore it has been customary to pay no attention to the precise shape of the ends of the short pieces of wire which are cut to provide suitable blanks from which to make needles by swaging or cold compression. In practice, however, it is found that a burr accidentally left on the end of the blank by the cutter or an end thereof, so cut as to leave a face having a plane inclined to the axis of the blank, or of other irregular form, causes a serious imperfection in the swaged needle made therefrom, by serving to produce a concealed chamber in the needle, or to leave a cold sheet-scale on it, the presence of either one being usually developed only when the needle is used, thus occasioning much inconvenience and loss; but by grinding the end of each blank to substantially the form shown in Fig. 5—that is to say, conical—or making each extremity of the blank constitute the apex of a cone, all of the above-named imperfections are avoided. To this end the within-described machine embodies means for supplying a needle-blank holder with a mass of blanks which holds the latter side by side, means for moving the holder and blanks along and rotating the latter while so moved, and for grinding the ends thereof to the aforesaid form while being so moved and rotated.

In the drawings, A is the bed of the machine, on which is bolted a centrally-located angle-piece, A′, and to the latter is bolted a vertical support, d', on which are hung suitable bearings to receive a shaft having thereon a worm, d, and on the end of said shaft a driving-pulley, c, is secured, driven by a belt, c', or other suitable means. The support d' has also a bearing for a short shaft standing at right angles to said worm-shaft, on which is secured a worm-gear, e, engaging with worm d, and a pulley, e', on which a belt, e^2, runs. Two posts, a' a', are bolted to the angle-piece A′, which support between them a pulley, f, over which also belt e^2 runs. Two other posts, a', (making four with the above-mentioned two,) are bolted to the angle-piece A′, between the first-named ones and the support d', and between said four posts is supported a grooved way, a, having a groove, 6, therein, and two lateral projections thereon, on each of which is adjustably secured an abutment-plate, 3.

A box, H, is hung under the rear end of the way a, and the latter extends from the box beyond the posts a', between which the pulley f is supported. A bar, a^2, is secured between said four posts, a', in a position parallel with the way a, through which is a series of adjusting-screws, 2, which are adapted to operate against a shoe, b, which lies on the belt e^2, and keep the latter in a proper position, for purposes hereinafter set forth.

Two head-stocks, D, are so bolted to the bed A as to provide for their adjustment thereon toward or from the way a, and in suitable bearings thereon is placed a shaft carrying on one end a grinding-wheel, E, and on the other or elsewhere on the shaft a driving-pulley, as shown. The said grinding-wheels are located opposite the said lateral projections on the way a, on which are the abutment-plates 3.

A needle-blank table, B, is located at the

end of the way *a*, and is supported on a post, B′, which is bolted to an angle-piece, A^2, the latter being bolted to the bed A.

The table B is provided with a groove, 8, in a line with the groove 6 in the way *a*, and said grooves are of corresponding width and depth, and each side of said groove 8 is adjustably secured to the table by an overhanging guide-strip, 4, one of which is partly cut away, leaving a connecting-strip, 14, and from said cut-away strip there extends two arms, 15 15, at right angles thereto on the face of the table, and between said arms the feed-plate *m* is adapted to slide. A box, J, for holding the blanks 10 which are to be ground is supported (partly by an arm, 12,) over the slide *m*, so that when the latter is drawn from under the box the space between the bottom of the latter and the face of the table will be equal to the diameter of the blanks in the box.

A needle-blank holder, 5, Fig. 4, having an abutment plate or head, 9, at each end united by a rib, 13, is adapted to slide in the groove 8 in the table and in the groove 6 in way *a*. In practice the space between the heads 9 is equal to the length of the cut-away part of strip 4 and to the width of the slide *m*, and the thickness of the heads 9 above rib 13 is somewhat less than the diameter of the needle-blanks, so that the belt e^2 will bear only on the latter in order to rotate them. The blank-holder, as shown in Fig. 4, is somewhat enlarged. Several blank-holders are employed with each machine, as hereinafter described.

To provide means for moving the pulleys *e* and *f* and the way *a* up and down for adjustment, the support *d*′ and the posts *a*′ are adjustably secured to the angle-piece A′. Table B is also capable of a like adjustment.

The operation of the machine is as follows: The length of the blanks or wires 10 having been determined, the strips 4 4 on the table B are adjusted to a proper distance apart to permit the ends of the blanks to pass freely under their overhanging borders, as seen in Fig. 2, the abutment plates 3 3 are adjusted so that their inner edges shall be on a line with the said guide-strips 4, and the head-stocks D are properly set to bring the peripheries of the wheels E into proper relation with the ends of the blanks as the latter arrive opposite the wheels. The under face of the belt e^2, adjoining the way *a*, is then, by screws 2 in bar a^2, forced downward sufficiently to cause the belt to bear on the blanks when they and the holder 5 are between it and the way *a*. The box J being supplied with blanks in the order shown, the holder 5 is placed on table B, the opening between its heads 9 being opposite the opening in strip 4 and the end of slide *m*. The latter is then drawn from under box J, letting the bottom course of blanks in the box drop on the table. The slide is then moved toward the box and against the ends of said bottom course of blanks, carrying the latter bodily onto the holder. The operator then pushes the latter and the blanks over the table, and the end of the holder far enough under belt e^2 to cause the latter, which is running in the direction indicated by the arrows in Fig. 1, to engage with the surface of the blanks, they and the holder being held up against the pressure of the belt by the way *a*, on which the holder slides, the slight friction between the latter and the way being sufficient to keep the blanks turning. The action of belt e^2 on the blanks causes them to be all rotated simultaneously, and to be so forced against the forward head 9 of the holder as to draw that along, so that the blanks and the holder move together, the blanks continuing to revolve while passing and bearing against the wheels E, and until they pass from under belt e^2. As the blanks arrive between the wheel E and the plate 3, one end thereof comes in contact with the latter, and the blanks are thereby prevented from moving endwise when they come in contact with the wheel, first one end being ground and then the other as they pass each wheel, and then the holder and ground blanks are carried off from the end of the way *a* and dropped into the box H. As soon as the first holderful of blanks has passed along out of the way, another one is pushed under belt e^2, so that two or more are moving along the way *a* at the same time.

The above-described manner of treating the needle-blanks insures uniformity of length, which, together with the aforesaid advantage arising from the conical-shaped end, contributes to the production of needles of uniform length and quality.

It is obvious that the within-described machine may be employed for cone-shaping pieces of wire for other purposes than for needle-blanks, and for use in any art where such pieces are required.

What I claim as my invention is—

1. In a machine for grinding the ends of wire to a cone shape, a way for a wire-holder to slide on having an abutment-plate on opposite sides thereof, a wire-holder having two heads, between which to place the wires which are to be ground, a belt to move over and in contact with said wires, one or more grinding-wheels adapted to revolve near to and in a plane at right angles to said way, and means, substantially as described, for regulating the pressure of said belt against the wires, combined and operating substantially as set forth.

2. In a machine for grinding the ends of wire to a conical shape, a way for a wire-holder to slide on having on opposite sides thereof an abutment-plate adjustable to and from the center of the way, a wire-holder for holding pieces of wire, having two heads thereon, a belt to move over and in contact with said wires, one or more grinding-wheels adapted to revolve in a plane at right angles to said way and adjustable toward and from the latter, and means, substantially as described, for regulating the pressure of said belt against the wires, combined and operating substantially as set forth.

3. The way *a*, the belt e^2, the wire-holder 5, having an abutment-plate, 9, at each end, and having a sliding motion on said way, which is imparted to it through the contact of said belt with the pieces of wire carried thereon, the shoe *b*, and means, substantially as described, for forcing the shoe against said belt, combined and operating substantially as set forth.

4. The grooved way, the table B, grooved to coincide with the way, and having the guide-strips 4 4 thereon, one of which is cut away at its side and has arms 15 thereon, the holder 13, the box J, and the slide *m*, combined and operating substantially as set forth.

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Witnesses:
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A. M. HOWARD.