(No Model.) 2 Sheets—Sheet 1.

J. BERRY.

CLAMP FOR HOLDING AND ROTATING NEEDLES WHILE GRINDING THEM.

No. 279,075. Patented June 5, 1883.

Fig. II.

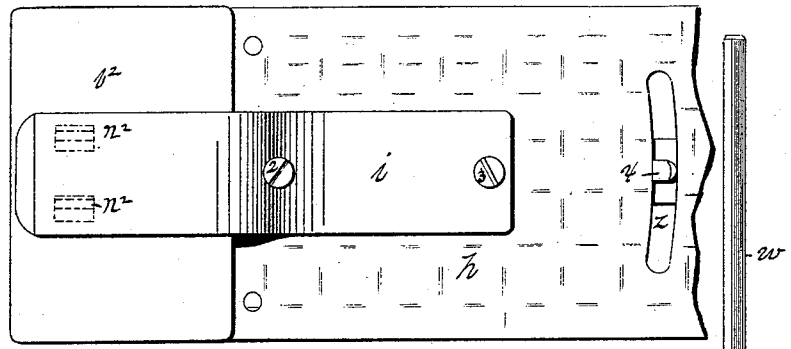


Fig. I.

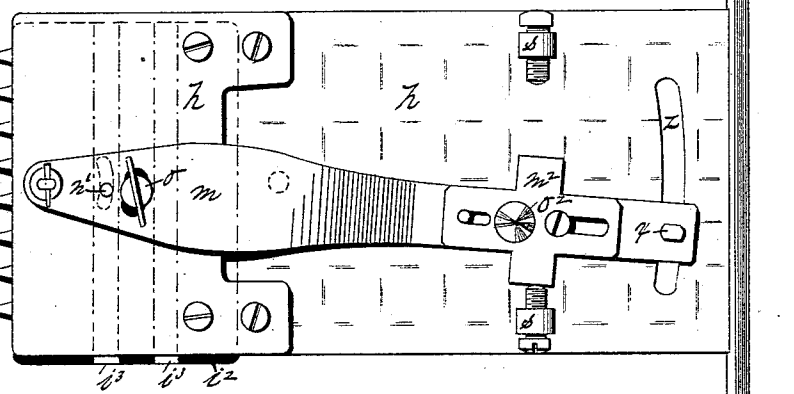


Fig. II.

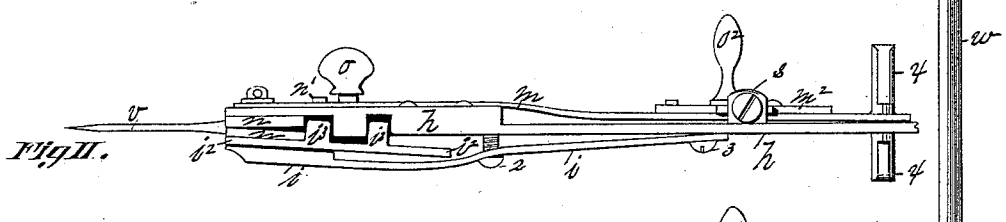


Fig. III.

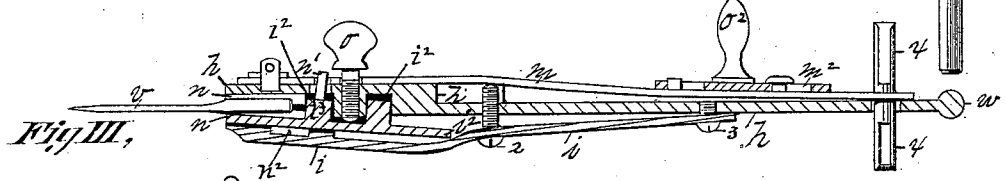


Fig. III.

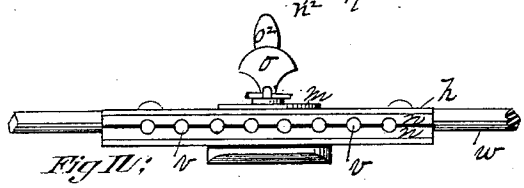
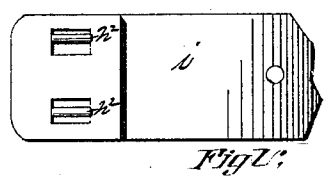


Fig. V.



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(No Model.) 2 Sheets—Sheet 2.

J. BERRY.

CLAMP FOR HOLDING AND ROTATING NEEDLES WHILE GRINDING THEM.

No. 279,075. Patented June 5, 1883.

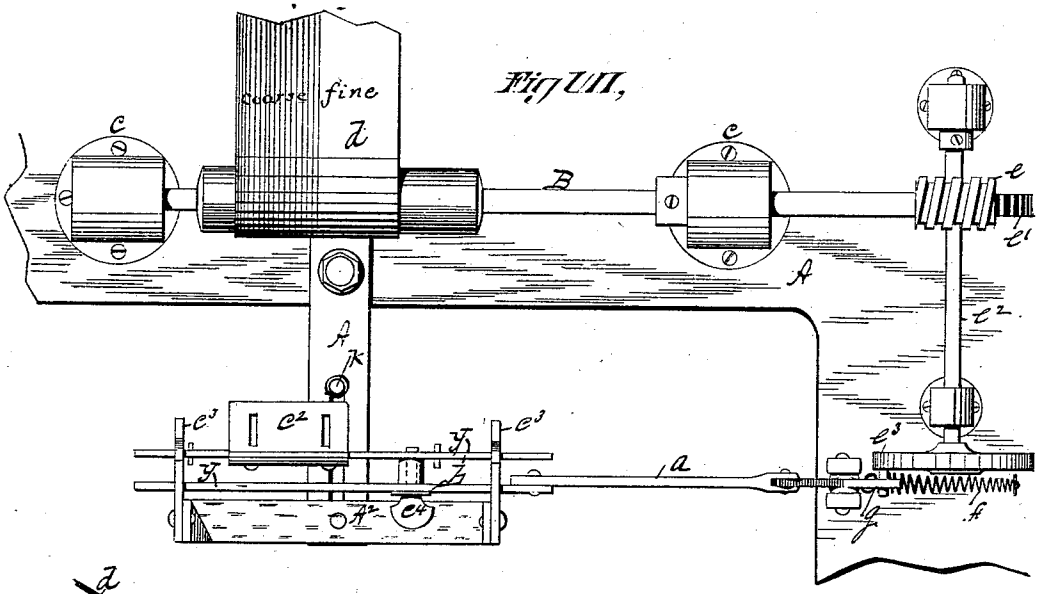


Fig VII.

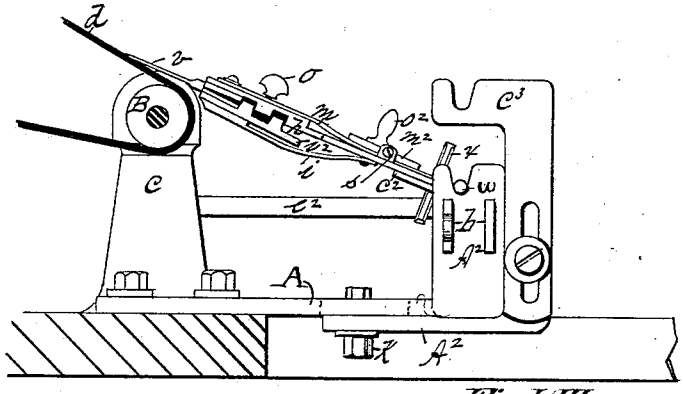


Fig VIII.

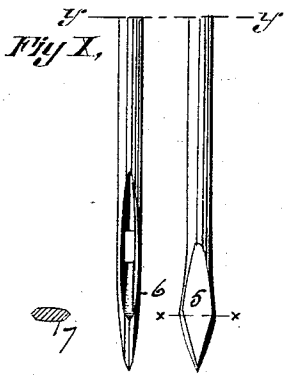


Fig X.

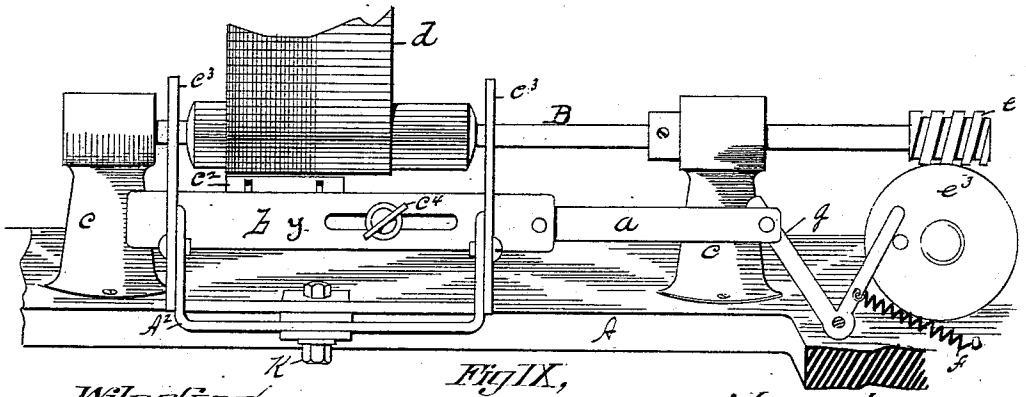


Fig IX.

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Atty

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UNITED STATES PATENT OFFICE.

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

CLAMP FOR HOLDING AND ROTATING NEEDLES WHILE GRINDING THEM.

SPECIFICATION forming part of Letters Patent No. 279,075, dated June 5, 1883.

Application filed June 9, 1882. (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 Clamps for Holding and Rotating Needles while grinding them, of which the following is a specification.

This invention relates to the construction of improved mechanism for holding and giving motion to a series of needles while they are being pointed; and it consists in a clamp to hold a series of needles by their shanks, and to give them a reciprocating rotary motion while they are permitted to lie against a grinding belt or wheel, and in mechanism for giving said clamp a reciprocating motion before said belt or wheel, the object being to provide mechanical devices for holding and giving to needles suitable variable motions, while they are being pointed, to produce needle-points of many different forms, but securing perfect uniformity of shape in each class.

In the drawings forming part of this specification, Figure I is a plan view of a needle-clamp constructed according to my invention, showing clamped therein a series of needles. Fig. II is an edge view. Fig. III is a longitudinal section. Fig. VI is a back plan view, partly in section. Fig. IV is an end view. Fig. V is a plan view of a portion of the clamp-spring. Fig. VII is a plan view of a portion of the grinding-belt, its front shaft, and mechanism connected with the latter for holding and operating said clamp embodying my invention. Fig. VIII is a side elevation of said clamp, together with the mechanism for holding and operating the same. Fig. IX is a front elevation of the mechanism shown in Fig. VII. Fig. X illustrates certain forms of needle which can be produced by the employment of the improvements herein described.

Like letters refer to like parts in the several figures.

In grinding needles heretofore, for the purpose of producing ordinary or specially-formed points, it has been the custom of operatives to hold them between the thumb and finger to give them a rolling motion, and to apply their points at the same time to a proper grinding-surface. The manipulation of needles in that way required great skill if anything approaching uniformity of product was the result, and the reproduction of a particular form anything nearly identical with a model was almost impossible; but by the aid of the improved mechanism herein shown and described uniformity of shape and reproduction thereof are easily accomplished, and such is the rapidity of manipulation that great economy in cost of manufacture is the result.

The needle-clamp and holder consists of a frame-plate, *h*, having a somewhat thick forward end, and a radial slot, *z*, through it near one end. A shaft, *w*, is fixed on its rear end, and a yielding pad, of leather, *n*, or other suitable material, is secured on its under side, just at the end of its front end. A clamp-plate, i^2, having on it the guide-ribs i^3 i^3, which enter loosely into grooves in the under side of plate *h*, is held up against the latter by a clamp-spring, *i*, which bears hardest on said plate near its front edge, and is secured to plate *h* by the screw 3. A screw, 2, passes through spring *i*, and serves to diminish or increase the force thereof. A pin, *n'*, is fixed in one of ribs i^3, or other convenient place on plate i^2, and projects up through a radial slot in plate *h*, as shown in dotted lines in Fig. I. A pad, *n*, like that above described on plate *h*, is secured on plate i^2, directly under the former. The end of spring *i*, which bears up against plate i^2, is made thick, and provided with two shallow cavities for the reception of two rollers, n^2 n^2, Fig. V, which are of a diameter greater than the depth of said cavities.

A lever, *m*, is pivoted near the front end of plate *h*, and from thence extends nearly to the rear end of said plate, and there has a vertical pin, *x*, fixed in it, which passes down through the radial slot *z* in said plate, and one end projects above said lever, as shown. Said lever *m* is perforated radially to let the thumb-screw *o* pass through it, the latter being adapted to be operated, turning in plate *h* against plate *i* thereunder. Lever *m* is also perforated to receive the end of pin *n'* in plate *i*. Lever *m* is provided with an adjusting-slide, m^2, of cross form, held and guided thereon by a screw and a pin, as shown in Fig. I, which pass

through slots therein into said lever beneath. Said slide is provided with a handle, o^2, for conveniently sliding it on said lever. Two stop-studs and screws, *s s*, are fixed in plate *h*, opposite the sides of slide m^2.

The devices for operating said needle-clamp mechanically consist of a shaft, B, (which may be the one which supports one end of the emery or grinding band *d*, or one especially mounted for this purpose,) supported in suitable stands, *c c*, on the frame or bed A, on which is fixed a worm, *e*. A shaft, e^2, is properly supported under shaft B and at right angles thereto, and is provided with a gear, e', with which said worm *e* engages, and also with crank-disk e^3, fixed to one end thereof. An elbow-lever, *g*, is hung to bed A, with one arm of which a spring, *f*, is connected, and its opposite arm is pivotally connected, by the connecting-rod *a*, with the sliding frame *b*, which is supported in the frame A^2. Said frame *b* consists of two sliding bars, *y y*, adjustably united by the screw c^4, passing freely through a slot in the outer of said bars, through a collar between them, and screwing into the inner one. Said last-named bar has fixed to it a perforated plate, c^2. The frame A^2 is adjustably secured to an arm of bed A by a bolt, *k*, to provide for fixing said frame at convenient distances from the band *d*. Two needle-clamp rests c^3 c^3 are adjustably secured to frame A^2, one at either end thereof, and provided with suitable notches into which to lay the shaft *w* on said needle-clamp.

The operation of the above-described devices in grinding the points of needles is as follows: Ordinarily the needles *v* are first flattened at the points, as in Fig. I, and then finished in the needle-clamp; but the entire operation, including flat and finish grinding, may be done in said clamp. Said needles, having been flattened, are set in any suitable manner so that the flat sides of their points are in one plane, and are held while the needle-clamp is made to grasp their round shanks between its upper and nether pads, *n n*. The clamp is operated for this purpose as follows: Screw *o* is turned against plate i^2, swinging the latter away from plate *h* sufficiently to open the front end of the clamp far enough to receive said needle-shanks between said pads, and when they have been so placed screw *o* is turned back, letting spring *i* operate and clamp the needles and hold them in the position shown in Fig. I. It will now be seen that if the rear end of lever *m* be swung back and forth, the clamp-plate i^2 will be given a reciprocating motion under plate *h*, which will cause the needles *v* to be reciprocally rotated between the pads *n n* on plates *h* and i^2. To cause said swinging movement of lever *m*, and at the same time to properly support said clamp steadily and at the right angle of incline before the band *d*, the shaft *w* is laid in frame A^2, and the clamp is supported about in the position shown in Fig. VIII, with the flattened sides of the needles against band *d*, and at the same time pin *x* in lever *m* is passed through one of the holes in plate c^2 on frame *b*, the latter being given a reciprocating motion through the revolving crank-disk e^2 and spring *f*, whereby lever *m* is vibrated, and the needles *v* are given a regular and uniform rocking or reciprocating rotary motion on said band, which causes said flattened sides of their points to be ground to a true and correct oval, as represented in the needle 6, Fig. X. After one side of said needle-points is ground, the clamp is turned over to bring their opposite sides against band *d*, and the operation is repeated.

It will be observed that band *d* is represented with a portion of its face lighter than the other. This is to indicate coarse and fine emery, the latter for the finish-grinding. Thus, after the above-described grinding is completed, the clamp is lifted and moved to the right, letting pin *x* drop into the right-hand hole in plate c^2, and both sides of the needle-points are finished by substantially the same movements as were given to the clamp in the first grinding, and present uniform and true oval sides. The clamp is opened, as already described, to take out the finished needles, others are put in, and the operations are repeated.

To grind spear-pointed needles, as represented by 5, Fig. X, and by the section 7 of same about line *x x*, and other special forms, the clamp is held at different degrees of incline before band *d*, and different degrees of rotary motion are given to the needles. Thus, to form said spear-points on the needles *v*, the preliminary operations are as above described for grinding ovals, after which the rear end of the clamp is lifted and shaft *w* rested on the rests c^3. The pin *x* in lever *m* is now disengaged from the reciprocating frame *b*, and the slide m^2, which, during said preliminary operations, remained in the position shown in Fig. I, is now moved up on said lever, carrying the arms of said slide above the stops *s s* and letting the edges of lever *m*, as it is vibrated, swing quite against said stops, and increasing the reciprocating movement of plate i^2, and consequently the rotation of the needles. While the clamp is operated in this position it is held, as before, by one hand to let the needles properly bear on band *d*, and with the other hand lever *m* is operated to rotate the needles, first to bring one edge of their points and then the other onto the face of the band *d*, and every needle of the series will be ground uniformly to the shape shown in Fig. X at 5, or to such shape as the angle of incline of the clamp, together with the incline line of the grinding-band and the degree of rotation of the needles, unitedly determine, and the supporting devices for the rear end of the clamp, and the pitch of the band *d*, can be so adjusted as to adapt them to co-operate with the clamp to produce an endless variety of point forms uniform in size and contour.

The ribs i^3 i^3 on plate i^2, adapted to lie in grooves in plate *h*, serve to guide the clamp-plate in its transverse movements, and the

rolls n^2 n^2 in spring i obviate friction between the faces of said spring and the clamp-plate i^2, as the latter, while being pressed against the needle-shanks, is reciprocated under plate h.

Screw c^4, passing through the front slotted bar of frame b into the rear bar thereof, serves to adjust the latter and plate c^2 to bring said plate to the proper position before the grinding-band d.

When said clamp is employed for grinding the ordinary round-pointed needles, lever m is adapted to give to the clamp-plate i^2 sufficient reciprocating lateral motion under plate h to roll the needles held by the clamp far enough in each direction to effect the even grinding of their points on all sides thereof.

It will be understood that needles clamped and held as above described may be made to roll slightly between the pads n n, or to make an entire revolution therebetween.

What I claim as my invention is—

1. A portable needle-holding clamp capable of being turned from side to side to hold and give to needles, while grinding their points, an oscillating motion, consisting of the following elements, viz: a frame-plate supporting the operative parts of said clamp, a clamp-plate adapted to bear against said frame-plate and attached to the latter by a spring, and a vibratory lever pivoted to said frame-plate and engaging with said clamp-plate, combined and operating substantially as set forth.

2. A portable needle-holding clamp capable of being turned from side to side to hold and give to needles, while grinding their points, an oscillating motion, consisting of the following elements, viz: a frame-plate supporting the operative parts of said clamp, a clamp-plate adapted to bear against said frame-plate and attached to the latter by a spring, and a vibratory lever pivoted to said frame-plate and engaging with said clamp-plate, and mechanism, substantially as described, for varying the vibratory movements of said lever, combined and operating substantially as set forth.

3. In combination, the frame-plate h, the clamp-plate i^2, spring i, provided with the rolls n^2 n^2, the screw o, and mechanism, substantially as described, for imparting to said clamp-plate a reciprocating transverse motion across the face of said plate h, substantially as set forth.

4. In combination, the frame-plate h, the clamp-plate i^2, adapted to be pressed against plate h by a suitable spring, and the lever m, pivoted to plate h, and adapted to engage, by means substantially as described, with said clamp-plate, substantially as set forth.

5. In combination, the frame-plate h, provided with the lever-stops s s, the lever m, the slide m^2, adjustable on said lever, and the clamp-plate i^2, substantially as set forth.

6. In combination, the frame-plate h, having the transverse shaft w thereon, the clamp-plate i^2, the lever m, provided with the pin x, the sliding frame b, provided with the perforated plate c^2, and mechanism, substantially as described, for imparting a reciprocating motion to said frame b, substantially as set forth.

7. In combination, the frame A^2, providing supports for the rear end of the needle-clamp, the frame b, having its front bar slotted, the rear bar having the perforated plate c^2, secured thereto, and the screw c^4, passing through said slot into said rear bar, substantially as set forth.

8. As an improvement in forming the points of needles, first presenting a series of needles arranged side by side at an angle to the grinding-surface and rolling them back and forth to a determined extent to grind the needles to form oval faces, and then increasing the angle of the needles to the grinding-surface and again turning them back and forth, but to such greater extent as will bring the opposite edges successively upon the grinding-surface and form converging beveled edges, substantially as set forth.

9. The clamp constructed to hold a series of needles, and provided with appliances whereby said needles may be oscillated, while grinding, to any desired extent, in combination with a rest arranged adjacent to the grinding-surface, and with a support, the rest and support having bearings for the clamp at different heights, substantially as and for the purpose set forth.

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