

(No Model.)

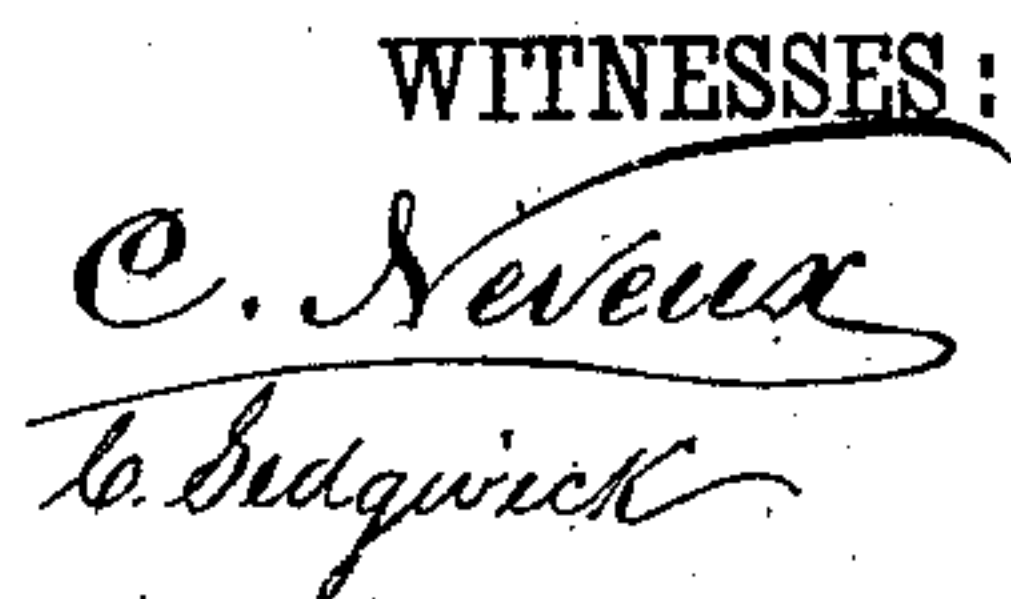
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J. J. M. CHAUVET.

# MACHINE FOR MAKING SEWING MACHINE NEEDLES.

No. 273,027.

Patented Feb. 27, 1883.



INVENTOR:

BY

**ATTORNEYS.**

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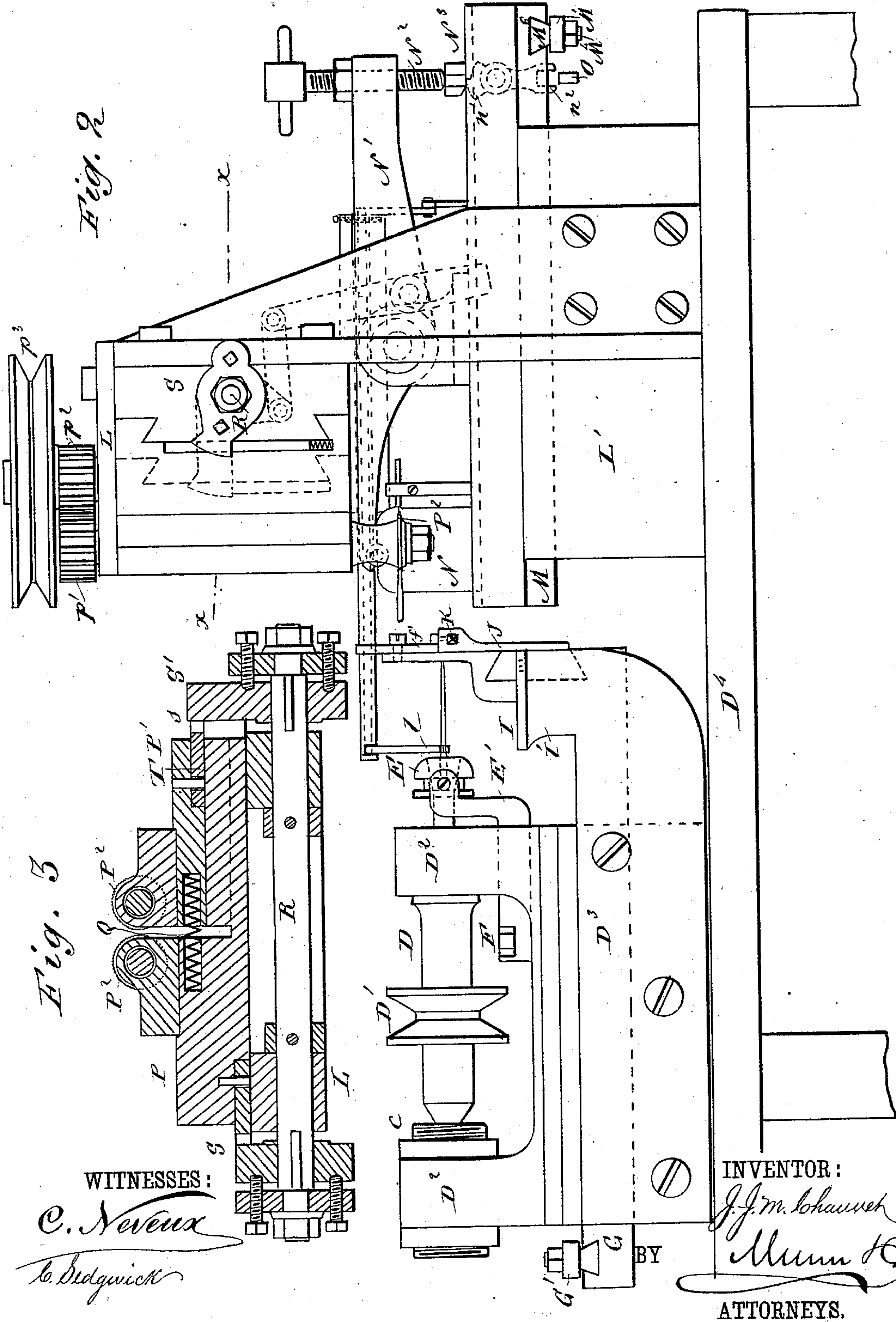
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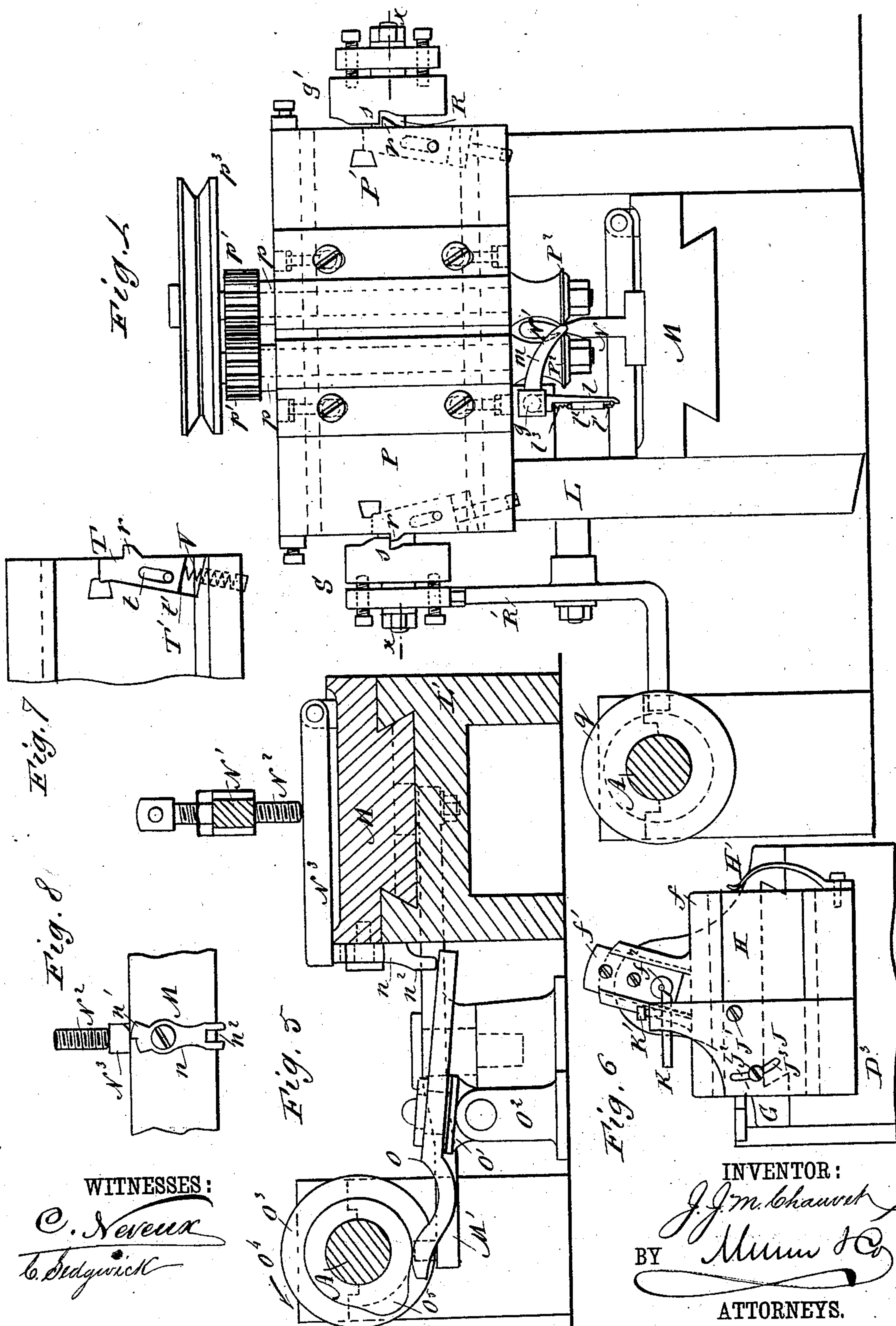
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# UNITED STATES PATENT OFFICE.

JOSEPH J. M. CHAUVET, OF NEW YORK, N. Y.

## MACHINE FOR MAKING SEWING-MACHINE NEEDLES.

SPECIFICATION forming part of Letters Patent No. 273,027, dated February 27, 1883.

Application filed August 18, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH J. M. CHAUVET, of the city, county, and State of New York, have invented a new and Improved Machine for Making Sewing-Machine Needles, of which the following is a full, clear, and exact description.

My invention relates to improvements in machines for making sewing-machine needles; and it consists in the peculiar construction and arrangement of parts, as hereinafter fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improved machine for forming and grooving sewing-machine needles. Fig. 2 is a longitudinal elevation of the same. Fig. 3 is a sectional plan view of the needle-grooving mechanism on the line *x x*, Figs. 2 and 4. Fig. 4 is a cross-sectional elevation of the machine on the line *y y*, Fig. 1. Fig. 5 is a cross-sectional elevation of the same on the line *z z*, Fig. 1. Fig. 6 is a front end elevation of the device for forming the needle out of the piece of steel wire. Fig. 7 is a detail inside elevation of the cam mechanism of the sliding blocks of the needle-grooving mechanism. Fig. 8 is a detail longitudinal elevation of the rocking cam acting on the needle-holding lever of the mechanism for grooving the needles.

The machine is composed of three different mechanisms—one for shaping the butt end of the needle and cutting off the wire, a second for tapering down the wire to form the needle, and a third for providing the needle with the side grooves—all the said mechanisms being operated from one main longitudinal shaft, A, which is rotated by some suitable devices, in the example shown a gear-wheel being provided.

The wire is fed to the machine and into a sliding clutch or holder, A', which is reciprocated by a lever, A<sup>2</sup>, provided between its free end and its fulcrum with a stud, A<sup>3</sup>, against which a cam, B, mounted on the shaft A, operates, the free end of the lever A<sup>2</sup> being drawn toward the said cam by a spring, A<sup>4</sup>. The holder A' is so constructed that it only grasps the wire C, from which the needles are to be made, when the said clutch moves in the direction toward the interior of the machine. By the

holder A' the wire is fed into a clamp, B<sup>2</sup>, which is closed so as to grasp and hold the wire when the holder A' moves in the direction from the clamp B<sup>2</sup>. The clamp B<sup>2</sup> is closed automatically by a cam, B<sup>3</sup>, on the shaft A, and is opened by a spring, B<sup>4</sup>, on the clamp B<sup>2</sup>. The wire C passes through a spring-eye, *a*, or between spring-fingers at the outer end of an arm, C', pivoted to the free end of a pivoted arm, C<sup>2</sup>, to which is pivoted an angle-arm, C<sup>3</sup>, which passes into a cam-groove in the side of a collar, C<sup>4</sup>, mounted on the shaft A.

A reciprocating cutter, C<sup>5</sup>, is located adjoining to the inner surface of the clamp B<sup>2</sup>, and is drawn in the direction from the wire by a spring, C<sup>6</sup>, and is pressed through the wire by a cam, C<sup>7</sup>, whereby the said cutter C<sup>5</sup> cuts off the wire C at the desired length. The end of the wire held by the spring-fingers or spring-eye *a* passes into a cutter-head, *a*<sup>2</sup>, adapted to form the base end of the needle, and mounted on the end of a journaled shaft, *a*<sup>3</sup>, provided with a belt-pulley, *a*<sup>4</sup>, and surrounded by a spring, *a*<sup>5</sup>, which presses the shaft *a*<sup>3</sup> in the direction from the end of the wire C—that is, in the direction of the arrow *a'*, as shown in the top of Fig. 1.

One end of a pivoted lever, *b*, rests against the end of the shaft *a*<sup>3</sup>, and the opposite end of this lever rests against a cam, *b*<sup>2</sup>, mounted on the shaft A, whereby, when the shaft A rotates, the lever *b* pushes the shaft *a*<sup>3</sup> in the inverse direction of the arrow *a'*, upon which the spring *a*<sup>5</sup> presses the shaft *a*<sup>3</sup> in the direction of the arrow *a'*. A spindle, D, provided with a belt-pulley, D', is journaled in standards D<sup>2</sup> on a block, D<sup>3</sup>, which is adapted to slide slightly on the top plate, D<sup>4</sup>, of the machine-frame.

The sliding block D<sup>3</sup> is provided with an arm, D<sup>5</sup>, provided with a stud which enters a cam, *d*<sup>4</sup>, of a collar, *d*<sup>5</sup>, on the shaft A, whereby the block D<sup>3</sup> will be reciprocated.

One of the bearings of the spindle D consists of a screw, *e*, in one of the standards D<sup>2</sup>, for the purpose of adjusting the spindle in position. The outer end of the spindle is beveled, and is provided with one or more transverse slits, forming a chuck or clutch, which is adapted to hold a needle.

An internally-beveled collar, E, surrounds the chuck end of the spindle D, and is held loosely in the upper end of an angle-arm, E', adapted to slide on the top of the block D<sup>3</sup>, through the



lower end of which angle-arm  $E'$  a pivoted lever,  $F$ , passes, which is provided at the end opposite the one passing through the angle-arm  $E'$  with a stud,  $F'$ , passing into a cam-groove,  $F^2$ , in the collar  $C^4$ , mounted on the shaft  $A$ , whereby when the shaft  $A$  is rotated the angle-arm  $E'$  will be reciprocated.

A frame,  $G$ , is adapted to slide longitudinally and horizontally in the block  $D^3$ , and is connected at one end by a pin with the slotted end of a horizontally-rocking lever,  $G'$ , which is provided at the opposite end with a stud passing into a cam-groove,  $G^2$ , of a collar,  $G^3$ , mounted on the shaft  $A$ . In the opposite end of the frame  $G$  a dovetailed transverse slide,  $H$ , is held, which is pressed toward the outer longitudinal side of the frame  $G$ —that is, in the direction of the arrow  $b'$  shown in the right-hand side of Fig. 1—by a spring,  $H'$ .

At the end opposite the one acted upon by the spring  $H'$  the slide  $H$  is provided with a finger,  $d$ , which rests against a former,  $I$ , the edge of which has the same shape as the contour of the completed needle, and which former  $I$  is attached to an upwardly-projecting arm,  $I'$ , of the block  $D^3$ . To the outer surface of the slide  $H$  a plate,  $J$ , is held by two screws,  $J'$  and  $J^2$ , the latter passing through a curved slot,  $J^3$ , thus permitting the said plate  $J$  to be adjusted in the inclination of its inner edge to the vertical plane.

In the upper end of the plate  $J$  a cutter or needle-shaping tool,  $K$ , is held by a binding-screw,  $K'$ , in such a manner that the said tool will be parallel with the end of the frame  $G$ , and can act on the needle-wire, which is held parallel with the longitudinal axis of the frame  $G$ .

To the end of the frame  $G$  a plate,  $f$ , is secured, in the upper end of which a slightly-inclined adjustable support,  $f'$ , is held in such a manner that the said support will be adjoining to the side of the cutting or shaping tool  $K$ .

The wire which is being shaped and formed into a needle passes through a guide-opening,  $f^2$ , of the adjustable support  $f'$ , and will thus be supported at the point at which it is being planed off or shaped by the shaper or cutter  $K$ . The guide-opening  $f^2$  may be made of any suitable size according to the size of the needles. Supporting-plates  $f'$ , having different sizes of guide-openings  $f^2$ , can be secured in the plate  $f$ .

A square bar-shaft,  $g$ , passes through a frame,  $L$ , holding the devices for grooving the needles, and can be reciprocated by a pivoted lever,  $g'$ , having one end slotted and connected with the said sliding shaft  $g$ , and having its opposite end provided with a segmental rack,  $g^2$ . The said segmental rack engages with a sliding rack,  $h$ , provided with a stud,  $h'$ , entering a cam-groove,  $h^2$ , in a collar,  $h^3$ , on the shaft  $A$ . The said square shaft  $g$  is provided with a longitudinal aperture throughout its entire length, and contains a round shaft,  $k$ , which is provided at the end opposite the one toward the mechanism for shaping

the needle with a crank,  $k'$ , to which is connected a rod,  $k^2$ , provided at its opposite end with a stud or finger entering a cam-groove in the side of a collar,  $k^3$ , on the shaft  $A$ , which cam-groove is so constructed that the shaft  $k$  will be rocked in a quarter of a circle at certain times.

The inner shaft,  $k$ , is reciprocated with the square shaft  $g$  surrounding it, and for that reason the crank  $k'$  must be mounted on the shaft  $k$  in such a manner that the said shaft can slide through the crank. To permit this the square shaft  $g$  must have a longitudinal slot through which the crank can pass, and at the end of the longitudinal slot must have a transverse slot to permit the crank to turn the shaft  $k$ .

At the end toward the mechanism for shaping the needle the shaft  $k$  is provided with a downwardly-projecting arm,  $l$ , which is provided with a slight curve or crook at its lower end, on which arm a sliding pin or finger,  $l'$ , is held in a casing,  $l^2$ , attached to the arm  $l$ , and is pressed downward by a spring,  $l^3$ .

A downwardly-curved arm,  $m$ , projects from the side of the square shaft  $g$  at the end toward the mechanism for shaping the needle.

A frame,  $M$ , slides on the frame  $L'$  parallel with the shaft  $D$  and under the frame  $L$ , which sliding frame  $M$  is operated by a pivoted lever,  $M'$ , provided with a stud passing into a cam-groove,  $M^2$ , in a collar,  $M^3$ , on the shaft  $A$ . The stroke of the frame  $M$  must be adjusted according to the length of the needle. For this purpose the pintle  $M^4$ , which secures the end of the lever  $M'$  to the sliding frame  $M$ , must be made adjustable. This is accomplished by attaching it to a dovetailed block,  $M^6$ , which slides in a transverse dovetailed groove in the under side of the outer end of the frame  $M$ . The said sliding frame  $M$  is provided on the end toward the shaft  $D$  with a block,  $N$ , upon which the needle is placed, and on which it is held by a clamping-lever,  $N'$ , which is pivoted on the sliding frame  $M$ , and is adapted to rock in the vertical plane. The front end of the said lever  $N'$  rests on the block  $N$ , and the rear end is provided with a vertical adjusting-screw,  $N^2$ , which rests on a transverse lever,  $N^3$ , pivoted on the rear end of the top of the sliding frame  $M$ , the free end of the said lever  $N^3$  resting on the upper end of a lever,  $n$ , pivoted to the side of the sliding frame  $M$ , and adapted to swing in the vertical plane parallel with the sides of the frame  $M$ . This lever  $n$  is provided at its upper end with a cam projection,  $n'$ , and is provided at its lower end with a fork,  $n^2$ .

A lever,  $O$ , is pivoted to swing laterally in a block,  $O'$ , which is pivoted to swing in the vertical plane on a standard,  $O^2$ , between the frame  $N'$  and the shaft  $A$ . One end of the said lever  $O$  passes into a cam-groove,  $O^3$ , in a collar,  $O^4$ , mounted on the shaft  $A$ . The cam-groove  $O^3$  is not provided with a circular bottom, but is provided at one point with a protuberance,  $O^5$ , so that at that point the cam-



groove will have less depth than at the other points, and consequently will rock the lever O in a vertical plane, the cam-groove being so formed that it also rocks the lever O laterally.

5 The end of the lever O opposite the one in the cam-groove O<sup>3</sup> is adapted to pass between the shanks of the fork n<sup>2</sup> of the lever n, for a purpose which will be described hereinafter.

Two blocks or plates, P and P', are held 10 flat against the front of the frame L, and are adapted to slide laterally in the vertical plane—that is, they are adapted to move to and from each other, and are pressed apart by a spring, Q, inserted in recesses in their adjoining edges.

15 In each of the said plates P and P' vertical shafts p are journaled at the adjoining or inner edges of these blocks, and the said shafts are provided at the upper ends with cog-wheels p', engaging with each other, and one of them 20 also engaging with a cog-wheel, p<sup>2</sup>, mounted on the same shaft with a belt-pulley, p<sup>3</sup>, on the top of the frame L, whereby both shafts p can be rotated by the pulley p<sup>3</sup>. By this construction the friction on the slides P P', which would be 25 produced by a driving-belt, is entirely avoided.

On the lower ends of the shafts p rotating 30 saws or cutters P<sup>2</sup> are mounted. The said rotating cutters serve to cut the side grooves into the needle, which is held on the block N by the lever N', as will be fully described hereinafter.

In sewing-machine needles one side groove must be longer than the other. For this purpose one cutter P<sup>2</sup> must act on the needle 35 longer than the other. The cutters act on the needle only when the same are pressed against the needle, and as the cutters are held in the blocks P and P' one of the said blocks must be pressed toward the middle of the frame 40 longer than the other. For this purpose I have journaled a transverse horizontal rocking shaft, R, in the frame L, which is connected with a pivoted angle-lever, R', the lower end of which enters a cam-groove, q, in a collar, q', 45 on the shaft A, whereby when the shaft A is rotated the shaft R will be rocked.

On the shaft R, I have mounted a small wheel, S', adjoining to the outer edge of the block P', and a large wheel, S, adjoining to the outer edge 50 of the block P, each of the said wheels being provided on the inner surface with a former, s, which formers are to act on teeth r of diagonally-sliding plates T, held in the outer edges of the plates or blocks P and P' in such a manner that the 55 teeth r project from the said outer edges of the plates P and P'. The said plates T are contained in recesses T' in the outer edges of the plates P and P', which recesses increase in depth from the upper toward the lower ends, 60 and in which recesses the plates T are pressed upward by springs V. The plates T are each provided with a longitudinal slot, t, through which a pin, t', passes into the block P or P'. If the pressure is exerted on the tooth r from 65 above, the plate T will be moved downward and along the inner beveled edge of its recess T', and consequently the tooth r will be with-

drawn into the recess; but if the pressure is exerted on the tooth r from below, the plate T cannot yield, as its upper end strikes the end 70 of the recess T', and consequently this pressure against the tooth from below will cause a lateral movement of the plate T and the block P or P' in which it is contained. If the wheels S and S' rock and their formers s move down- 75 ward, the plates T will be pressed within the recesses of the plates P and P'; but if the formers move upward they will strike against the lower edge of the teeth r, and will press the plates P and P' toward each other. As the 80 wheel S' has a greater diameter than the wheel S, the former s of the wheel S' will act on the tooth r of its corresponding plate, T, a less time than the former s of the wheel S acts on the tooth r of its corresponding plate, T, as the 85 former s of the wheel S' moves more rapidly than the former s of the wheel S—that is, the plate P' will be pressed toward the middle of the frame L a less time than the plate P, and consequently the cutter P<sup>2</sup> of the plate P' will 90 act on the needle a shorter time than the cutter P<sup>2</sup> of the plate P, and the result is that the cutter P<sup>2</sup> of the block P' will cut a shorter groove than the other cutter P<sup>2</sup>. An angle-lever, W, is provided at one end, which is in 95 front of the two cutters P<sup>2</sup>, with spring-fingers, which are adapted to seize the needle after it has been grooved. The short arm of the said angle-lever W is connected with one end of a pivoted lever, W', the other end of which is 100 connected with a rod, W<sup>2</sup>, the opposite end of which enters a cam-groove in the side of a collar, U, mounted on the shaft A, whereby when the shaft A is rotated the angle-lever W will be rocked and its free end moved to and from 105 the cutters P<sup>2</sup>.

The spring-fingers at the end of the lever W are adapted to seize the completed needle automatically, and then throw it over by the outward movement of the said lever W. 110

The operation is as follows: The wire C, from which the needles are to be formed, is passed into the machine in the direction of the arrow a', is then received by the reciprocating feeder or holder A', and passed into the clamp 115 B<sup>2</sup>, which holds it during the time that the holder A' is moved back again. From the clamp B<sup>2</sup> the wire is passed through the spring-finger a, which holds it, and from there into the rotary cutter-head a<sup>2</sup>, which forms the base 120 end of the needle. The cutter C<sup>5</sup> is forced in the direction of the arrow b'—that is, toward the wire—by its cam C<sup>7</sup>, and cuts off the wire at the desired length. When the wire enters the cutter-head a<sup>2</sup> the cam b<sup>2</sup> and the lever b 125 have forced the spindle a<sup>3</sup> from the end on which the cutter-head a<sup>2</sup> is mounted toward the end of the wire, and hold it there as long as the wire is being shaped. Then the cam b<sup>2</sup>, on account of its peculiar contour, releases the 130 lever b, and the spring a<sup>5</sup> forces the spindle a<sup>3</sup> in the direction of the arrow a'—that is, from the end of the wire which is being shaped by the said cutter-head a<sup>2</sup>. The piece of wire from



which the needle is to be made, and which has been cut off from the main piece of wire, will thus be held by the spring-finger  $a$  on the lever  $C'$ . By the action of the cam-groove in the collar  $C^4$  on the levers  $C^3$  and  $C^2$  the lever  $C'$  will be moved in the direction of the arrow  $b'$ —that is, toward the mechanism for shaping the needle; or, in other words, the lever  $C'$  carries the needle in front of the clutch end of the spindle  $D$  on the sliding block  $D^3$ , which sliding block  $D^3$  has been withdrawn in the direction of the arrow  $a'$  by the groove  $d^4$  in the collar  $d^5$  on the arm  $D^5$  of the block  $D^3$ . When the needle is in front of the clutch end of the spindle  $D$  the block  $D^3$  is moved in the inverse direction of the arrow  $a'$ , so that the butt-end of the needle passes into the clutch end of the spindle  $D$ . By that time the lever  $F$ , which is operated by the cam-groove  $F^2$  of the collar  $C^4$ , pushes the angle-arm  $E'$ , provided with the collar  $E$ , surrounding the clutch end of the spindle  $D$ , in the inverse direction of the arrow  $a'$ , whereby the clutch end of the spindle  $D$  will be pressed together by the said collar  $E$ , and will clamp and firmly hold the needle. Then the lever  $C'$  is withdrawn, and the spring-fingers separate and release the needle. At the same time that the needle is carried over in front of the spindle  $D$  it is pressed in between the lever  $l$  and its sliding finger  $l'$  on the squared shaft  $g$ , which arm  $l$  at the time hangs down vertically, and is directly in front of the clutch end of the spindle  $D$ . The cutter  $K$  then turns off or shapes the needle, the movement of this cutter in relation to the thickness of the wire of the needle being governed by the former  $I$ , against which the stud  $d$  of the plate  $J$ , holding the cutter  $K$ , rests. During this operation the former remains stationary; but the sliding frame  $G$  is pushed in the direction of the arrow  $a'$  by the lever  $G'$ , actuated by the cam-groove  $G^2$  in the collar  $G^3$ . The needle is gradually forced through the supporting-plate  $f'$ , which supports the needle at the point at which it is being turned off, and thus prevents the breaking of the needle. As soon as the needle has been turned the frame  $G$  is drawn in the inverse direction of the arrow  $a'$  by the lever  $G'$ . Then the shaft  $k$  is rotated a quarter-turn by the cam-collar  $k^3$ , and the rod  $k^2$  and the arm  $l$  are swung upward a quarter of a circle, so that its lower end will be directly in front of and before the block  $N$ , which is slightly grooved in its upper edge to adapt it to receive the needle, the needle being pushed upon this block by the arm  $m$ . The squared shaft  $g$  is moved in the inverse direction of the arrow  $a'$  by the action of the cam-groove  $h^2$  on the sliding rack  $h$ , and the action of the same on the lever  $g'$ , whereby the finger  $l'$ , holding the needle, will be moved toward the mechanism for grooving the needle. At that moment the lever  $O$  is raised, so that its inner end enters the fork  $n^2$  of the lever  $n$ , and then the cam-groove  $O^3$  moves the inner end of the lever  $O$  laterally, so that the cam  $n'$  will be forced under the end

of the lever  $N^3$ , whereby the free end of this lever  $N^3$  will be forced upward and will force the screw  $N^2$  upward, as well as the rear end of the lever  $N'$ , whereby the front end of the said lever  $N'$  will be pressed down on the block  $N$  and will hold the needle in place. After the needles have been grooved the lever  $O$  enters the fork  $n^2$ , and is turned laterally by its cam-groove, so as to swing the cam projection  $n'$  from under the lever  $N^3$ , and thus permitting the rear end of the lever  $N'$  to descend and the lever to be released. The wheels  $S$  and  $S'$ , provided with the formers  $s$ , press the cutters  $P^2$  against the sides of the needle, and the groove will be cut. As stated before, one cutter remains in contact with the needle longer than the other, so that a longer groove will be obtained on one side of the needle than on the other. As soon as the needle has been cut the lever  $O$  moves the cam  $n'$  on the lever  $n$  from under the end of the lever  $N^3$ , permitting the rear end of the lever  $N'$  to descend and the front end of the same to rise, thereby releasing the needle which is grasped by the spring-fingers at the end of the angle-lever  $W$ , and is thrown into a suitable receptacle.

The machine may be adjusted to make needles of different lengths and thicknesses, and the lengths of the grooves and the relative positions may be varied as may be desired. The shafts or spindles  $a^3$  and  $D$  and the pulley  $p^3$  are rotated by means of suitable belting, as circumstances may require.

I am aware that a machine for making sewing-machine needles in which the wire is first cut into required lengths, then pointed, and finally grooved is old; and I am also aware that it is old to cause one of the cutters which form the groove in the needle to act longer on the needle than the other, in order that one side groove may be longer than the other, and I therefore do not claim such inventions.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for making sewing-machine needles, the combination, with a single drive-shaft and the cams thereon, of the cutting, shaping, and grooving mechanisms, and the means for carrying the needle successively from the cutting to the shaping and from the shaping to the grooving mechanism, substantially as herein shown and described.

2. In a machine for making sewing-machine needles, the combination, with the laterally-sliding blocks or plates carrying the shafts on which the groove-cutters are mounted, of rocking formers, and of inwardly and downwardly sliding plates provided with projecting teeth or lugs and held loosely to the outer edges of the said laterally-sliding blocks or plates, substantially as herein shown and described, and for the purpose set forth.

3. In a machine for making sewing-machine needles, the combination, with the laterally-sliding blocks or plates carrying the shafts on which the groove-cutters are mounted, of rocking formers, of inwardly and downwardly slid-



ing plates provided with projecting teeth or lugs and held loosely to the outer edges of the said laterally-sliding blocks or plates, and of springs for pressing the said toothed plates upward and outward, substantially as herein shown and described, and for the purpose set forth.

4. In a machine for making sewing-machine needles, the combination, with the laterally-sliding plates or blocks P and P', of the inwardly and downwardly sliding plates T, held in the edges of the plates P and P', the teeth or lugs *r*, the springs V, and the pin *t*, passing through the longitudinal slot *t* in the plates T, substantially as herein shown and described, and for the purpose set forth.

5. In a machine for making sewing-machine needles, the combination, with the plates P and P', carrying the shafts on which the groove-cutters are mounted, and provided with sliding plates T, having projecting teeth or lugs *r*, of the rocking shaft R, and the wheels S S', provided on the sides with the formers *s s*, of different sizes according to the desired length of the grooves, which formers act on teeth or lugs of the said sliding plates, substantially as herein shown and described, and for the purpose set forth.

6. In a machine for making sewing-machine needles, the combination, with the laterally-sliding plates carrying the shafts on which the groove-cutters are mounted, of cog-wheels mounted on the said shafts, of an additional cog-wheel engaging with one of the cog-wheels on the said shafts, and of a belt-pulley united with the additional cog-wheel, substantially as herein shown and described, and for the purpose set forth.

7. In a machine for making sewing-machine needles, the combination, with the plates P and P', carrying the shafts *p p*, on which the cutters P<sup>2</sup> are mounted, the block N, the lever N', the screw or support N<sup>2</sup>, the transverse lever N<sup>3</sup>, and the swinging cam-lever *n* for raising the lever N<sup>3</sup> and the lever N', substantially as herein shown and described, and for the purpose set forth.

8. In a machine for making sewing-machine needles, the combination, with the plates P and P', holding the shafts *p p*, on which the cutters P<sup>2</sup> are mounted, of the block N, the lever N', the screw or support N<sup>2</sup>, the transverse lever N<sup>3</sup>, and the swinging lever *n*, provided at its upper end with a cam projection, *n'*, and at its lower end with a fork, *n*<sup>2</sup>, adapted to receive the end of a vertically and laterally swinging lever, O, substantially as herein shown and described, and for the purpose set forth.

9. In a machine for making sewing-machine needles, the combination, with the plates P and P', carrying the shafts *p p*, on which the cutters P<sup>2</sup> are mounted, of the block N, the lever N', the screw or support N<sup>2</sup>, the transverse lever N<sup>3</sup>, the swinging lever *n*, provided with a cam projection, *n'*, and a fork, *n*<sup>2</sup>, the vertically and laterally swinging lever O, and the collar O<sup>4</sup>, mounted on the shaft A, and provided

with a cam-groove, O<sup>3</sup>, having a protuberance, O<sup>5</sup>, in its bottom, substantially as herein shown and described, and for the purpose set forth. 70

10. In a machine for making sewing-machine needles, the combination, with the groove-cutters, of the sliding frame M, the lever M', operated from the main shaft, and the pintle M<sup>4</sup>, sliding in a transverse groove in the frame M, substantially as herein shown and described, and for the purpose of adjusting the stroke of the frame M, as set forth. 75

11. In a machine for making sewing-machine needles, the combination, with the sliding block D<sup>3</sup>, of the supporting clutch-spindle D for holding the needle-blank, and of the frame G, sliding in the block D<sup>3</sup>, and carrying the cutter for turning off and shaping the needle, substantially as herein shown and described, and for the purpose set forth. 80

12. In a machine for making sewing-machine needles, the combination, with the cam *d*<sup>4</sup> on the shaft A, and the sliding block D<sup>3</sup>, provided with the arm D<sup>5</sup>, having a stud engaging with said cam, of the supporting clutch-spindle for holding the needle-blank, of the frame G, sliding in the block D<sup>3</sup>, and carrying the cutter for turning off and shaping the needle, and of devices for moving the block D<sup>3</sup> and the frame G independently from each other and directly from the main shaft, substantially as herein shown and described, and for the purpose set forth. 85

13. In a machine for making sewing-machine needles, the combination, with the sliding block D<sup>3</sup>, holding the clutch-shaft which holds the needle while the same is being shaped, of a locking-collar surrounding the clutch end of the shaft, a sliding arm to which the said collar is attached, and of devices for moving the sliding block and the sliding lever independently of each other directly from the main shaft, substantially as herein shown and described, and for the purpose set forth. 90

14. In a machine for making sewing-machine needles, the combination of the sliding block D<sup>3</sup>, supporting the spindle D, for holding the needle-blank while the same is being shaped, the collar E, surrounding the clutch end of the spindle D, the slide-arm E', to which the collar E is attached, the pivoted lever F, connected with the sliding arm E' and acted upon by a cam-collar on the shaft A, and of the arm D<sup>5</sup>, connected with the block D<sup>3</sup> and acted upon by a collar on the shaft A, substantially as herein shown and described, and for the purpose set forth. 95

15. In a machine for making sewing-machine needles, the combination, with the block D<sup>3</sup>, adapted to slide in the direction of the length of the needle, of the frame G, sliding in the block D<sup>3</sup>, parallel with the same, and carrying the mechanism for shaping the needle, substantially as herein shown and described, and for the purpose set forth. 100

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