(No Model.) 6 Sheets—Sheet 1.

J. J. JENKINS.

MACHINE FOR PROVIDING KNITTING MACHINE NEEDLES WITH LATCHES.

No. 432,943. Patented July 22, 1890.

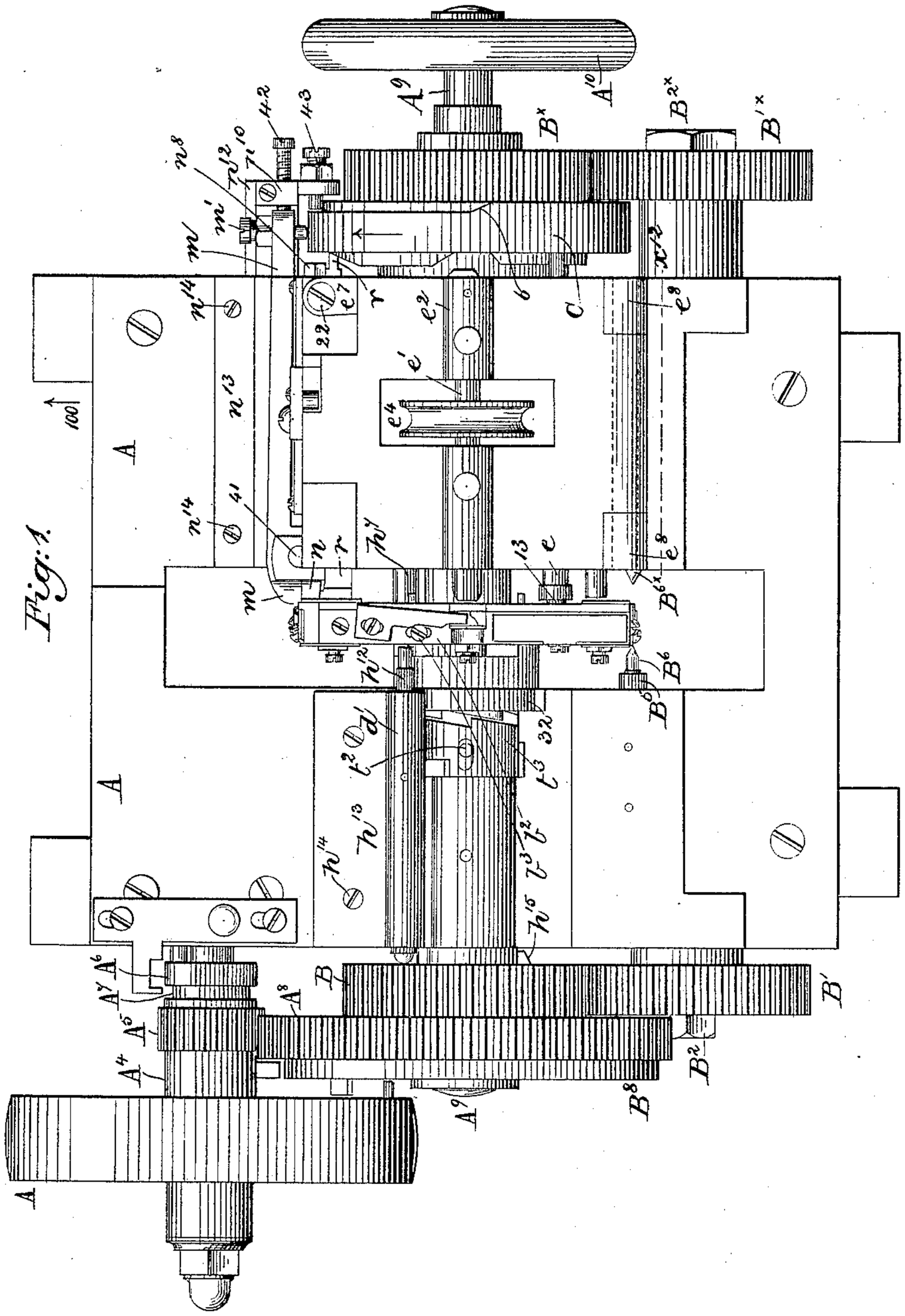

Fig. 1.

Witnesses:
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Roderick L. Emmy-

Inventor:
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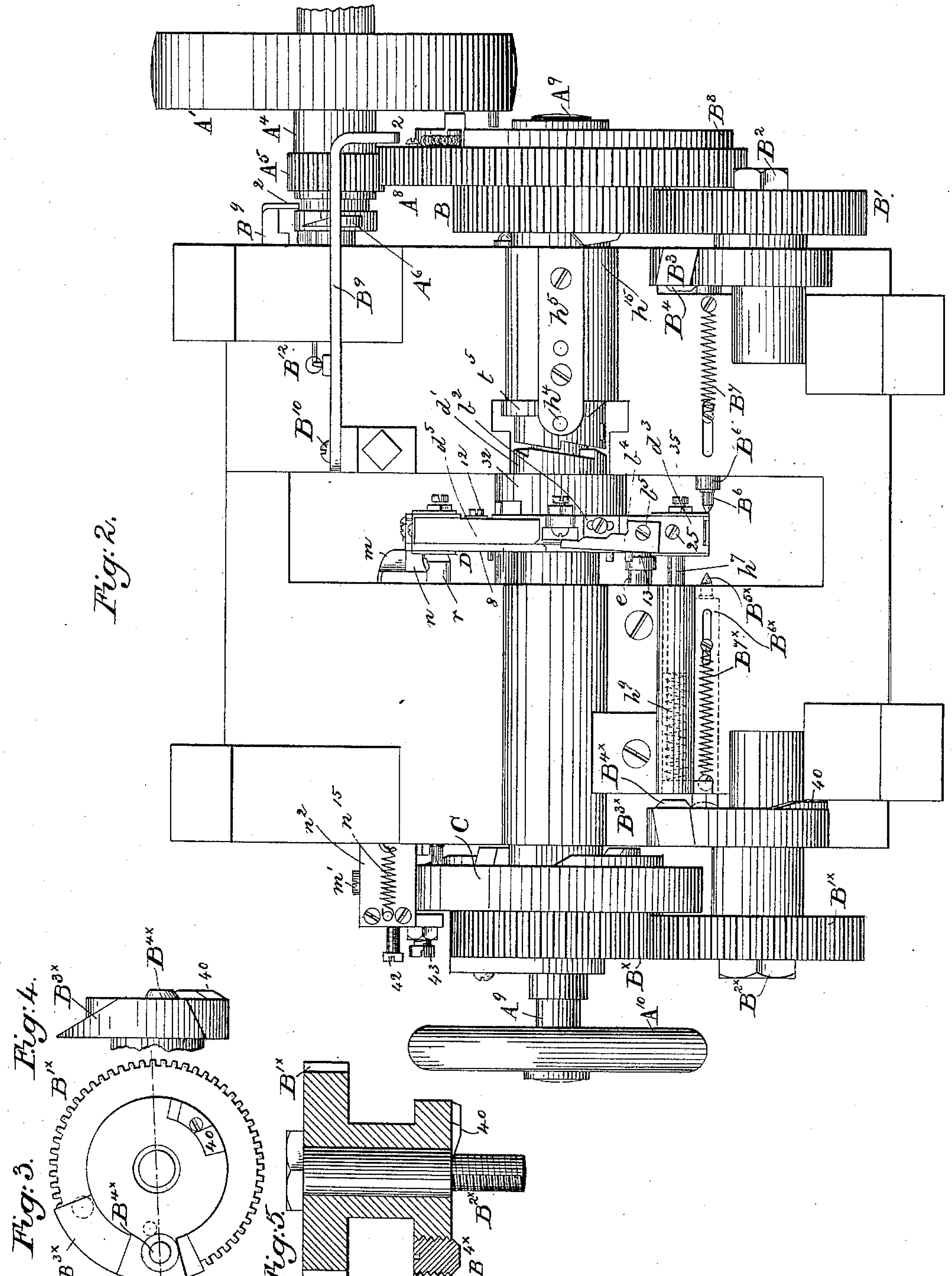
by Crosby & Gregory Attys

(No Model.) 6 Sheets—Sheet 2.

J. J. JENKINS.

MACHINE FOR PROVIDING KNITTING MACHINE NEEDLES WITH LATCHES.

No. 432,943. Patented July 22, 1890.



Witnesses:
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(No Model.) 6 Sheets—Sheet 3.

J. J. JENKINS.

MACHINE FOR PROVIDING KNITTING MACHINE NEEDLES WITH LATCHES.

No. 432,943. Patented July 22, 1890.

Fig: 8.

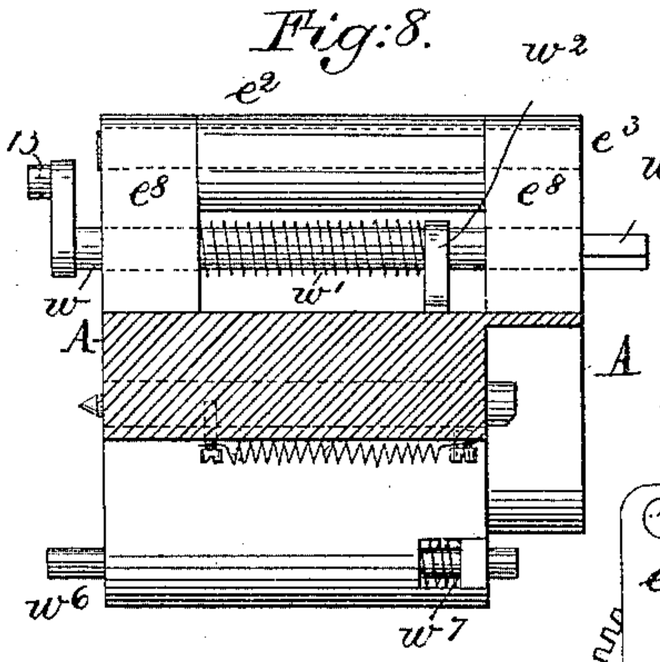
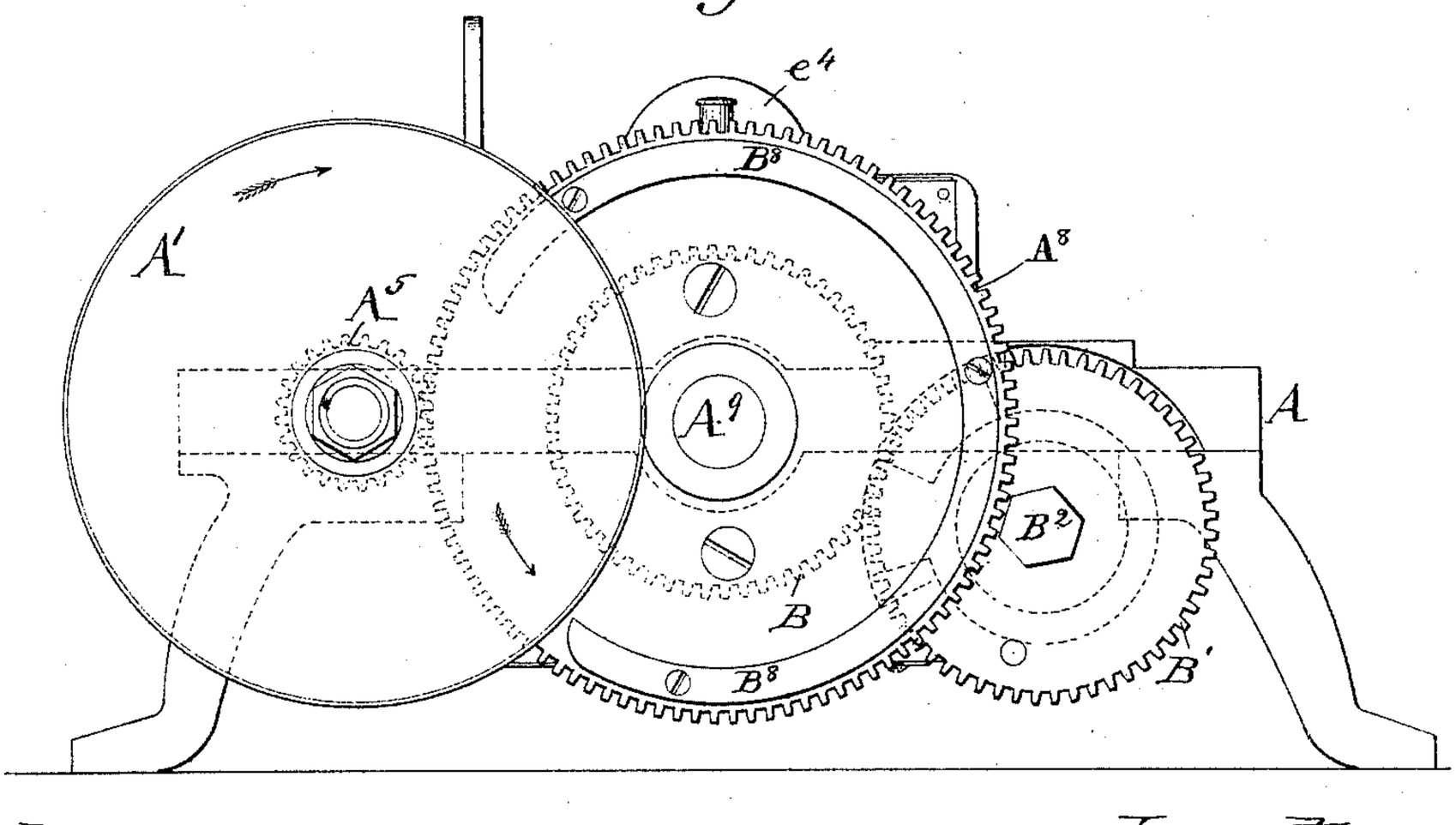


Fig: 6.

Fig: 7.



Witnesses:
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(No Model.) 6 Sheets—Sheet 4.

J. J. JENKINS.

MACHINE FOR PROVIDING KNITTING MACHINE NEEDLES WITH LATCHES.

No. 432,943. Patented July 22, 1890.

Fig: 15.

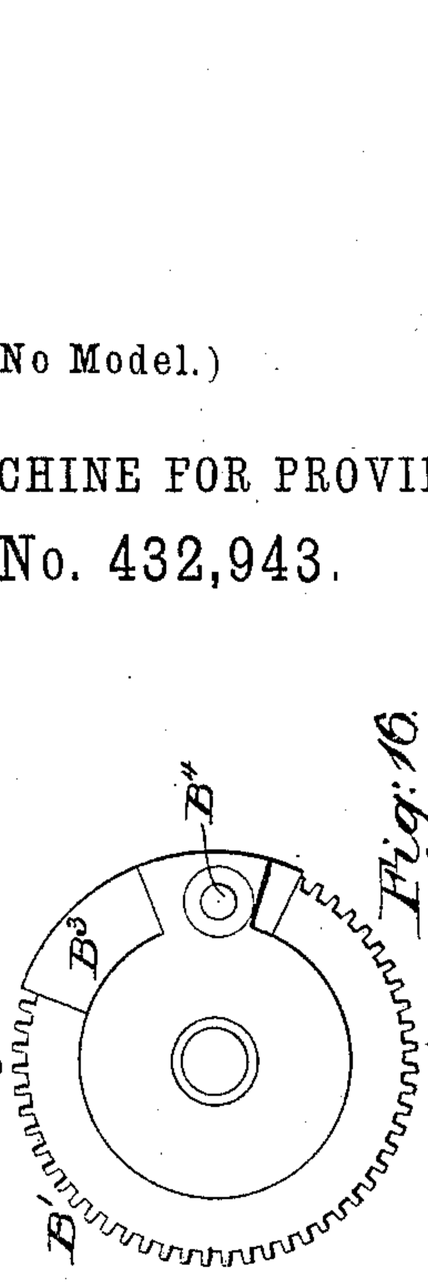


Fig: 16.

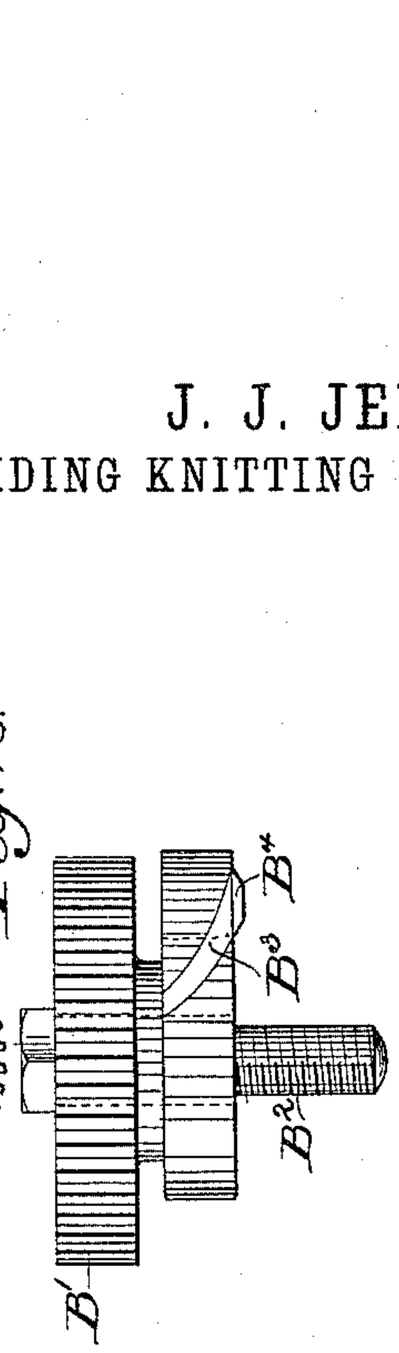


Fig: 12.ª

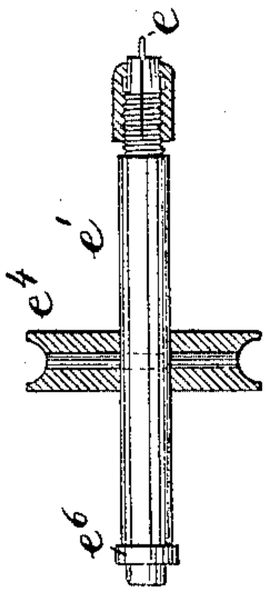


Fig: 11. Fig: 12.

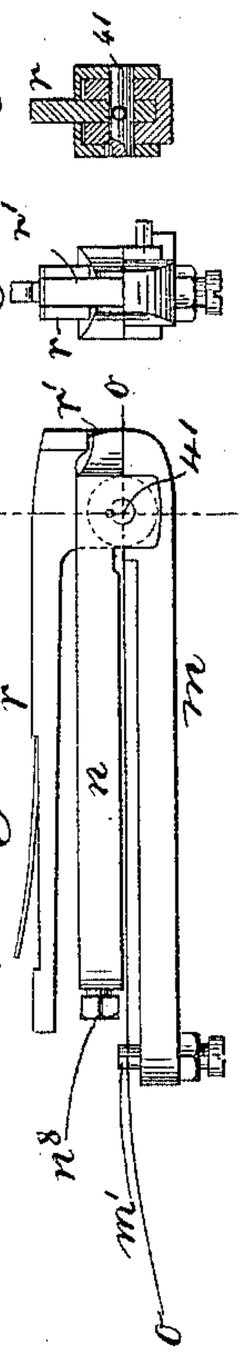


Fig: 13.

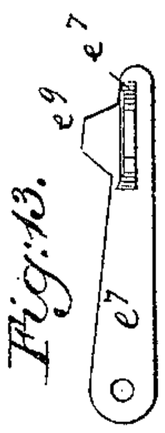
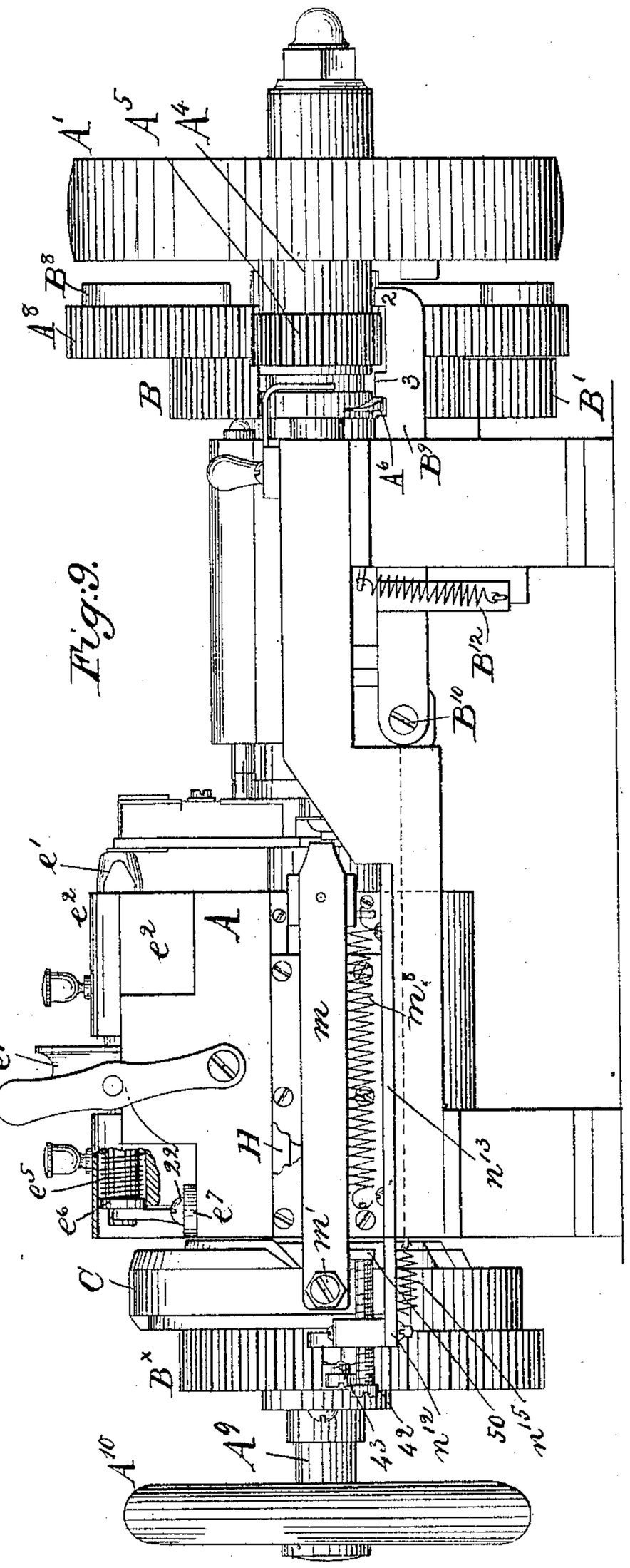


Fig: 14.

Fig: 10.

Fig: 9.



Witnesses:
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(No Model.) 6 Sheets—Sheet 5.

J. J. JENKINS.

MACHINE FOR PROVIDING KNITTING MACHINE NEEDLES WITH LATCHES.

No. 432,943. Patented July 22, 1890.

Fig:23

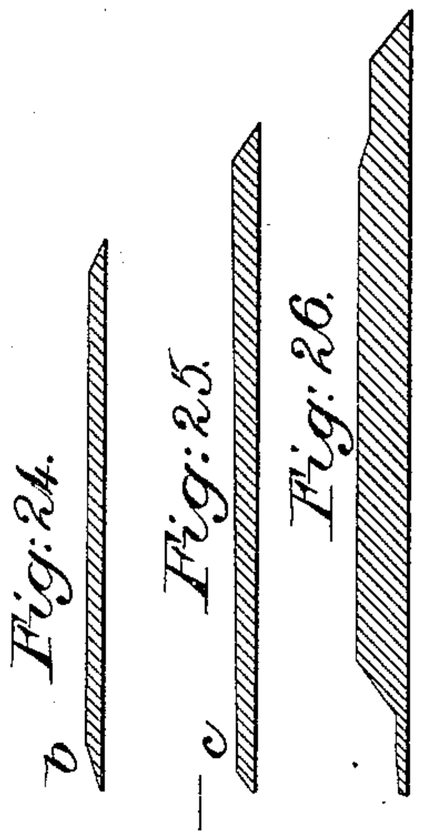

Fig:24.

Fig:25.

Fig:26.

Fig:29.

Fig:30

Fig:31.

Fig:21

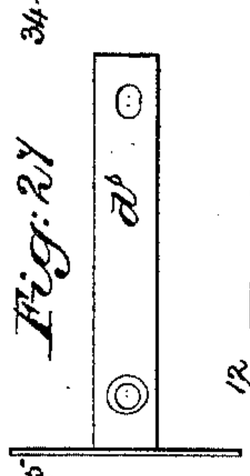

Fig:28.

Fig:35.

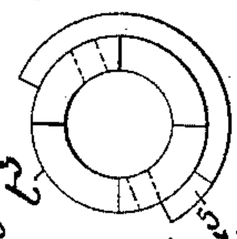

Fig:36.

Fig:33.

Fig:34.

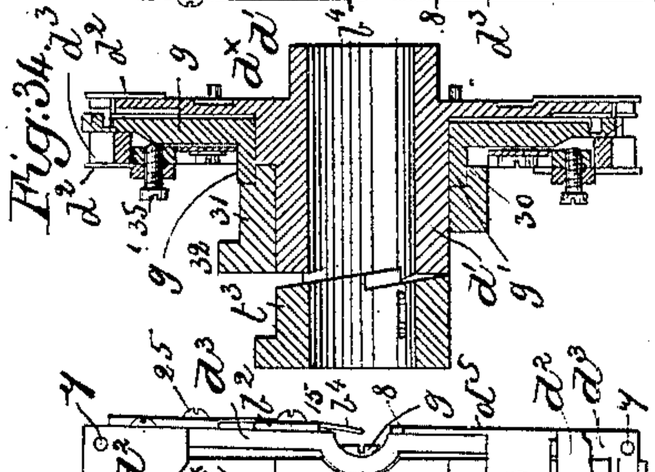

Fig:32.

Fig:20.

Fig:22

Fig:37.

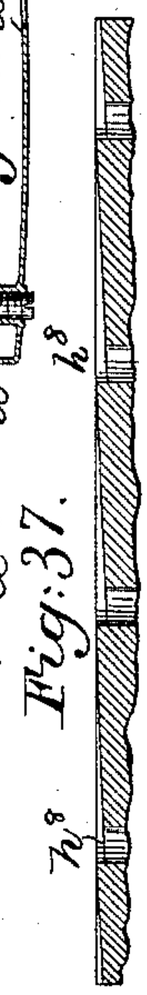

Fig:17.

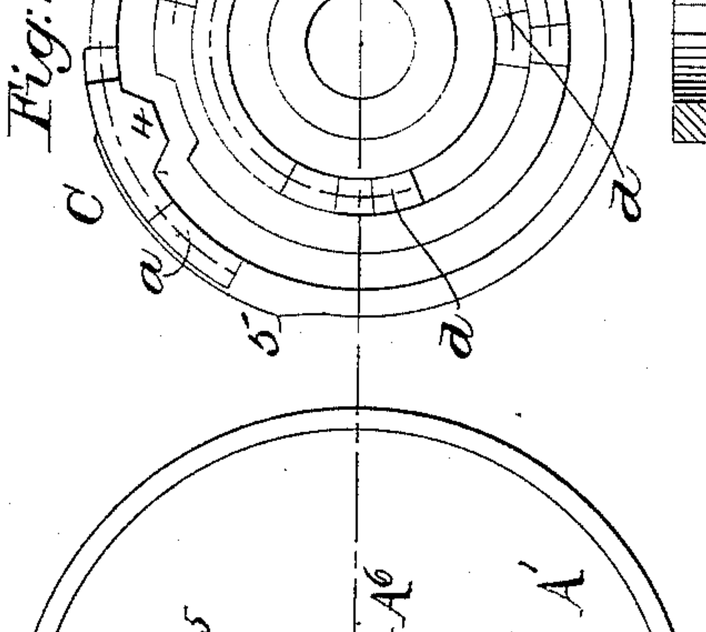

Fig:18

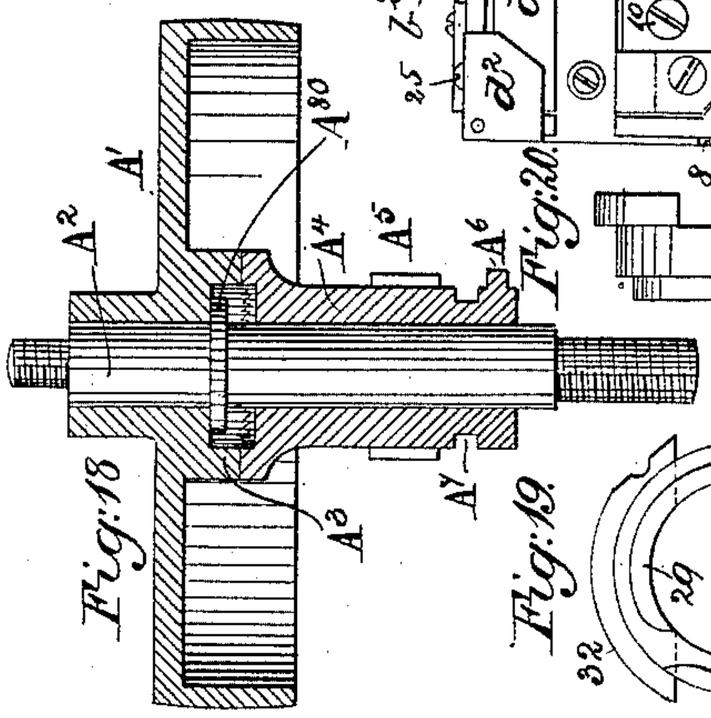

Fig:19.

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Francis L. Emmy-

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by Lemuel W. Gregory Atty's.

(No Model.) 6 Sheets—Sheet 6.

J. J. JENKINS.

MACHINE FOR PROVIDING KNITTING MACHINE NEEDLES WITH LATCHES.

No. 432,943. Patented July 22, 1890.

Fig 38

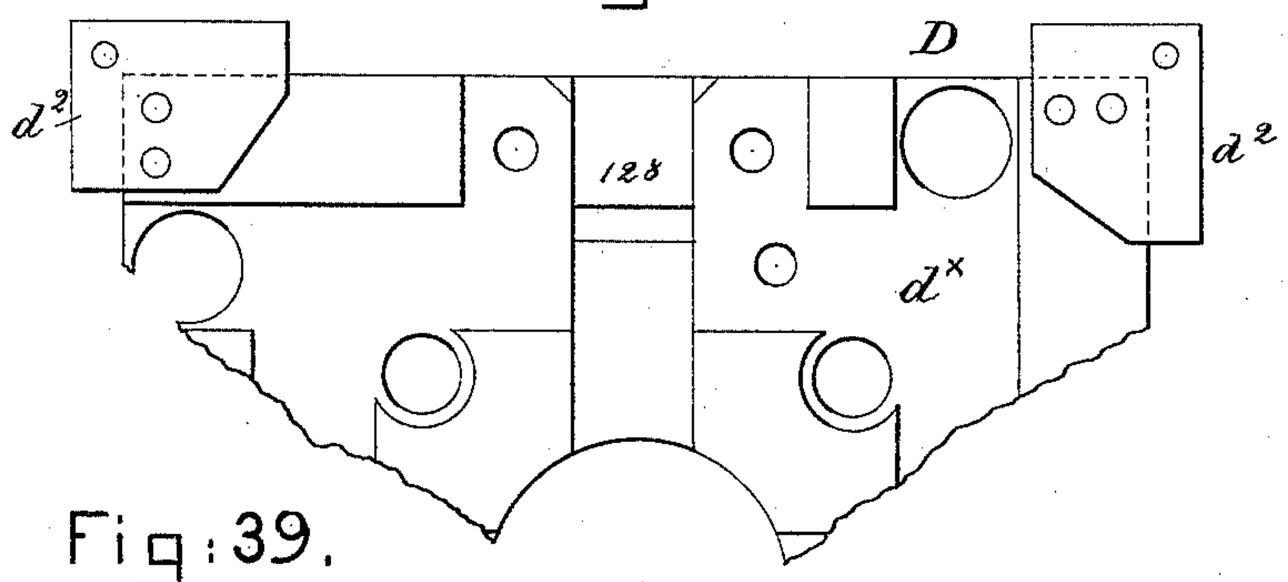


Fig: 39.

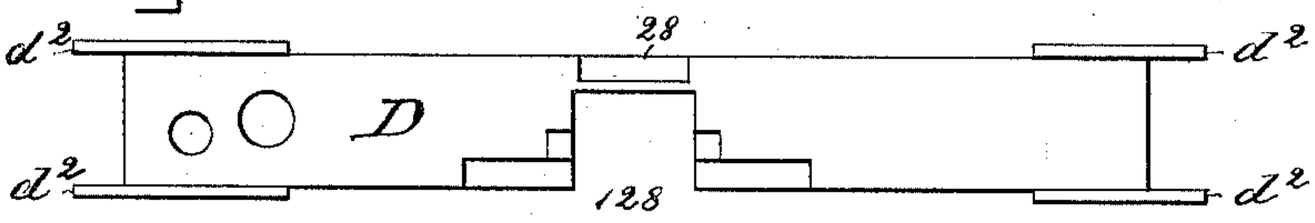


Fig: 42.

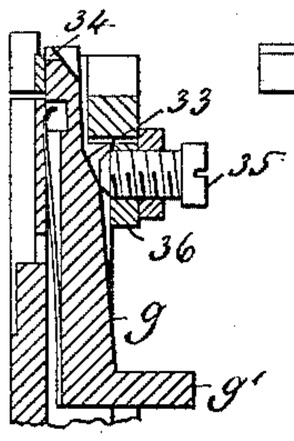


Fig: 40.

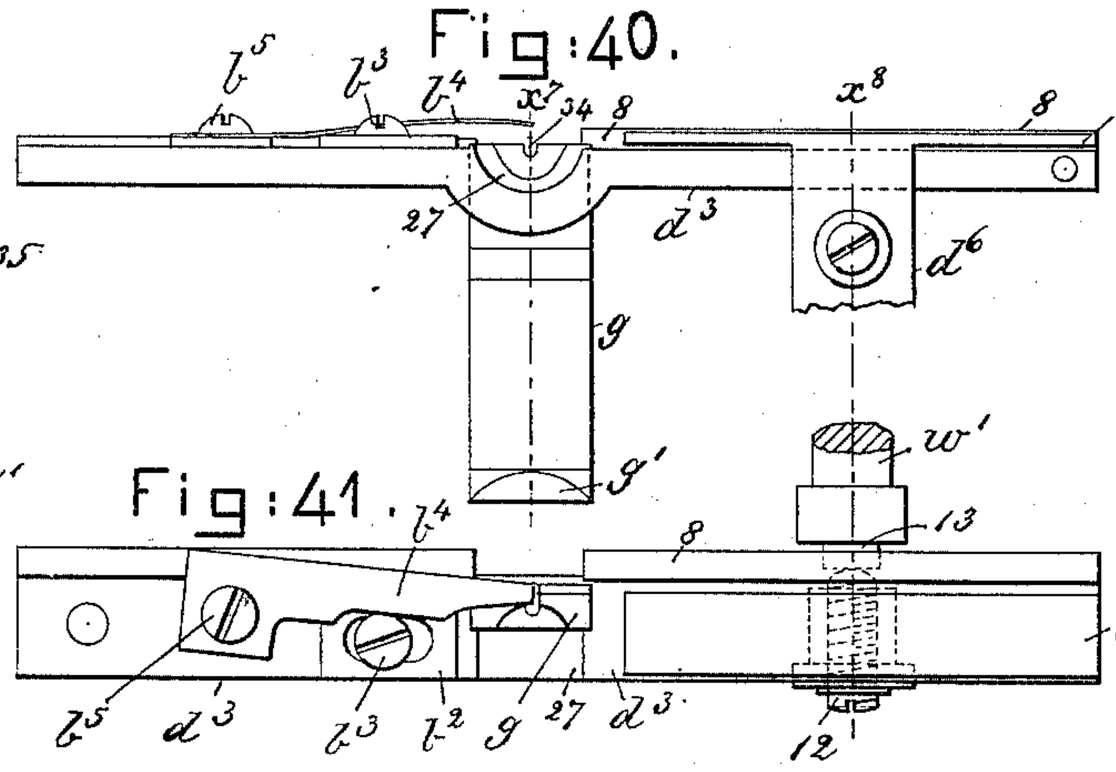


Fig: 43.

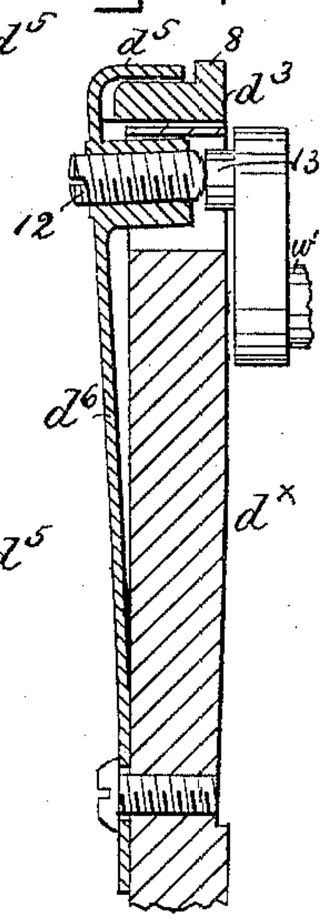


Fig: 41.

Fig: 44.

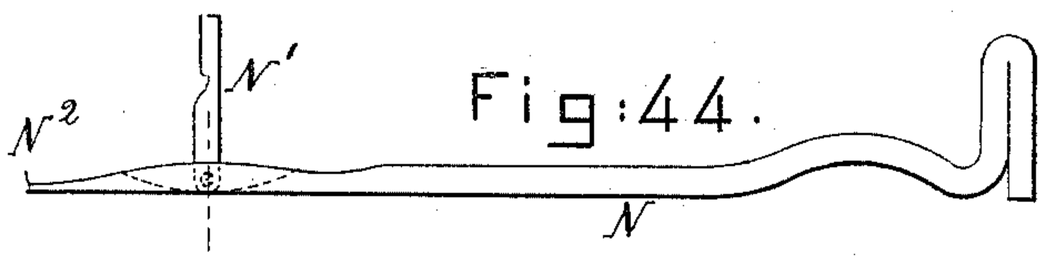


Fig: 45.

Fig: 46

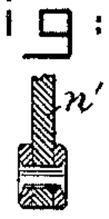
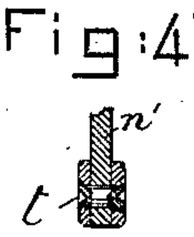


Fig: 47.



Witnesses.
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Fredrick L. Emmy

Inventor.
John J. Jenkins,
by Lemsby & Gregory Attys

UNITED STATES PATENT OFFICE.

JOHN J. JENKINS, OF MANCHESTER, NEW HAMPSHIRE, ASSIGNOR TO WILLIAM COREY, OF SAME PLACE.

MACHINE FOR PROVIDING KNITTING-MACHINE NEEDLES WITH LATCHES.

SPECIFICATION *forming part of* Letters Patent No. 432,943, dated July 22, 1890.

Application filed March 27, 1890. Serial No. 345,528. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. JENKINS, of Manchester, county of Hillsborough, State of New Hampshire, have invented an Improvement in Machines for Providing Knitting-Machine Needles with Latches, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The machine the subject of this invention is an improvement on that described in application, Serial No. 323,907, filed September 14, 1889.

In this my present machine a series of needles to be drilled are held in a movable carriage containing a series of clamps, the machine being provided with a drill, rivet-wire feeding devices, and heading devices by which to upset the ends of the rivet after the same has been inserted in the needle.

In this my improved machine it is possible to hold a series of needles, one needle being drilled while another is having a rivet inserted into it to hold the latch, and yet another needle is having its rivet upset.

The particular features in which my invention consists will be hereinafter described, and pointed out in the claims at the end of this specification.

Figure 1 is a top or plan view of a machine embodying my invention; Fig. 2, an underside view of the machine shown in Fig. 1. Figs. 3, 4, and 5 are details of one of the cam wheels and gears, to be referred to; Fig. 6, a right-hand end view of Fig. 1; Fig. 7, a left-hand end view of Fig. 1. Fig. 8 is a partial section of that part of the frame-work which carries the clamp-opening bunters or slide-rods and one of the heading devices to upset the rivet, the section being in the line x^{12}, Fig. 1, looking in the direction of the arrow 100. Fig. 9 is a rear side view of Fig. 1; Figs. 10, 11, and 12, details of the rivet-wire jaws or feeding device for inserting the rivet-wire into the hole drilled in the needle, and a cutter. Fig. 12^a shows the drill-spindle and drill detached, the drill being omitted from the other drawings to avoid confusion; Figs. 13 and 14, different views of the drill-spindle sliding lever; Figs. 15 and 16, details of one of the cams for actuating one of the heading-tools; Figs. 17 and 18, two views of the actuating-pulley and clutch device; Figs. 19 and 20, details of the cam for actuating the supporting devices, to be described; Figs. 21 and 22, details of the main cam. Figs. 23 to 26, inclusive, show the respective cam projections of the main cam developed; Figs. 27 and 28, two views of the spring member of the needle-clamping devices and its adjusting screw; Figs. 29, 30, and 31, details of the supporting device. Figs. 32 and 33 are respectively a right-hand face view and a left-hand face view, viewing Fig. 1, of the carriage and its attached parts, to be described. Fig. 34 is a section of Fig. 32 in the line x^2; Figs. 35 and 36, details of the clutch-hub employed to rotate the carriage; Fig. 37, a developed detail taken in the dotted circle, Fig. 33, to show the cam-shaped bottom of the groove in the body of the carriage; Fig. 38, a detail of about one-fourth part of the body of the carriage with all the movable pieces detached; Fig. 39, a top view of Fig. 38. Fig. 40 shows one of the clamps detached, together with one of the movable supports therein. Fig. 41 is a top or plan view of Fig. 40; Fig. 42, a section in the line x^7, Fig. 40; Fig. 43, a section in the line x^8, Fig. 40; Fig. 44, a side elevation of a needle with a latch inserted therein; Fig. 45, a section showing the drilled end of the latch between the walls of the needle. Fig. 46 shows the walls of the needle as drilled in line with the hole in the latch. Fig. 47 shows the rivet inserted and upset to pivot the latch.

The frame-work A is of suitable shape to sustain the working parts. The belt-receiving pulley A′, normally loose on a stud A^2 screwed into the side of the frame, has a hub A^3, provided with clutch-teeth, which hub is at times engaged by clutch-teeth at one end of the power-shaft A^4, it being shown as a sleeve loose on the said stud and having a pinion A^5, a cam A^6, and an annular groove A^7, a collar A^{80} on the said stud preventing the movement of the pulley A′ too far inward on the stud and the movement of the shaft too far outward thereon. The pinion A^5 en-

gages a toothed wheel A^8, fast on the main driving-shaft A^9, extended across the machine and provided, as herein shown, with a hand-wheel A^{10}. The toothed wheel A^8 has fast to it a gear B, which engages a gear B′. (Shown in Figs. 1 and 2 and separately in Figs. 15 and 16.) This gear B′ runs loose on a stud-screw B^2, and the hub of the said gear has a cam B^3, shown as a compound cam, the second member of the compound cam being a bevel-ended lug or screw B^4, terminating at or near the heel of the cam, the adjustment longitudinally of the said screw causing the effective stroke of the cam to be varied more or less, according to the thickness of the needle and the length of the rivet to be headed to hold the latch, the said cam in practice acting upon one end of and moving that one of the riveting devices B^5 located at the left in Fig. 1.

Making the portion B^4 of the compound cam separate from the portion B^3 is the best form known to me; but I desire it to be understood that this invention is not intended to be limited to the exact construction shown and provided for to effect the throw of the cam.

The heading tool or device B^5 is shown as a slide-bar having a suitable point B^6, a little larger in diameter than the rivet to be headed, a spring B^7, connected at one end to the said bar and at its other end to the frame-work, moving the said heading-tool in opposition to the said cam. The like heading tool or device $B^{5\times}$, having a point $B^{6\times}$ and moved in one direction by a spring $B^{7\times}$, is actuated to upset the head of the rivet next to it by a compound cam $B^{3\times}$ $B^{4\times}$ fast to the hub of a gear $B'^{\times}$, (see Figs. 3, 4, and 5,) running loose on a stud-screw $B^{2\times}$, the said gear $B'^{\times}$ being rotated by a toothed wheel $B^{\times}$, also fast on the shaft A^9, before referred to. These two heading tools or devices act simultaneously on the rivet-wire *t*, inserted into the drilled needle, as will be described, and head or upset the ends of the said rivet-wire at the side walls of the needle, as in Fig. 47, the rivets being upset in a countersink in the sides of the needle, the said countersinks being defined, as shown in Fig. 45, before the needle to be drilled is put in the clamp of the carriage.

The toothed wheel A^8 at its outer face (see Fig. 7) has a partial ring B^8, against the periphery of which bears the inturned end 2 (see Figs. 2 and 9) of a latch B^9, pivoted at B^{10} and acted upon by a spring B^{12} to normally keep the said catch against the partial ring B^8. In the rotation of the wheel A^8, as long as the end 2 bears against the partial ring B^8 the projection 3 of the said latch is kept out of the range of motion of the cam A^6, and at such times the clutch-teeth A^3 at the end of the sleeve-like power-shaft remain in engagement with the clutch-teeth of the belt-pulley A′, and the said shaft is rotated by the said belt-pulley.

The power-shaft gear A^5 is one-fourth the size of the wheel A^8 on the main shaft, and at the end of each third rotation of the power-shaft the part 2 of the latch leaves the partial ring B^8, so that the cam A^6 meets the part 3 of the latch, which during the next or fourth rotation of the power-shaft withdraws the clutch-teeth of the power-shaft from the clutch-teeth of the pulley A′, leaving the cam-shaft and machine at rest.

In practice the machine will be provided with a suitable forked lever to enter the annular groove A^7 of the power-shaft, to thereby move it to the left on the stud (see Fig. 1) whenever it is desired to start the machine, the latch B^9 being at such time depressed, this lever in practice being under the control of a suitable lever connected to a treadle, (not shown,) such parts being omitted because they are well known to mechanics and not requiring description.

The main shaft A^9 at the right-hand end of the machine (see Fig. 1) has a main cam-wheel C, (shown in face view, Fig. 21, and in diametrical section in Fig. 22,) the different cams thereon being shown as developed in straight lines in Figs. 23 to 26, inclusive. This cam-wheel C has four cams *a b c d* attached to or made a part of it. The cam *a* has a cam projection 4. The periphery of the cam-wheel has a cam projection 5, and the outer face of the cam-wheel has a cam-surface 6. (Shown in Fig. 1.) The main shaft also has splined on it by a pin t^2 (see Fig. 1) the clutch-hub t^3, employed to intermittingly engage the clutch-teeth at the end of the hub *d′* of the carriage D, to be described. The pin t^2 is of slightly-less diameter than the hole which it enters in the hub t^3, so that the said hub, while it rotates with the shaft A^9, may also be slid a little thereon to enenable the teeth of the said hub t^3 to engage the teeth of the hub *d′* and move the carriage one step and retire therefrom and leave the carriage at rest. The hub t^3 is provided with a cam t^5, (see Figs. 2, 35, and 36,) extended partially about the said hub, the said cam, in the rotation of the said hub with the shaft A^9, acting against a pin h^4 (see Fig. 2) in a plate h^5, attached to the frame-work in suitable manner, a suitable spring t^6, partially shown only in Fig. 35, and interposed between the said hub and the frame or bearing for the shaft A^9, normally acting to move the hub t^3 toward the hub *d′* and keep the cam projection t^5 in contact with the pin h^4. The cam projection *t* of the hub t^3 is of such length as to let the teeth of the said hub engage the hub *d′* and rotate the carriage one step during the last quarter-rotation of the main shaft A^9.

The carriage D, loose on the shaft A^9, is to hold and present the needles in succession to suitable tools to drill the needles, insert rivets and head them, and, as herein shown, the said carriage has four clamps to act upon and present a series of four needles successively to the drill, to the rivet-wire-feeding

devices, and to the heading devices to upset the rivet.

I have shown in Fig. 44 a needle N to be drilled, a latch N′, previously provided with a hole, being shown as set into the groove of the needle between its side walls, so as to fill the said space (see Fig. 45) when the drill acts to drill the side walls. Fig. 46 shows the needle drilled ready for the rivet-wire. Fig. 47 shows the rivet *t* upset thereon.

The carriage D is shown as composed of a quadrangular plate $d^{\times}$, having a hub *d′*, provided with ratchet-teeth at one end, and having attached corner pieces or ears d^2, adapted to receive the pins 7, which serve to pivot one end of each clamp, composed of a movable bed d^3 and a spring-plate $d^5\,d^6$, all the said clamps being alike. One of these beds, with a part of its co-operating spring-plate, is shown detached in Figs. 40 and 41, and enlarged. Each bed has a lip 8 along one edge, against which rests one side wall of the needle N, while the back of the said needle rests on the face of the bed, the opposite side of the needle being acted upon opposite the said lip by the end d^5 of the spring-plate $d^5\,d^6$, the shank d^6 being attached by set-screw 10 to the body $d^{\times}$ of the said needle-carriage, the said shank having a stop-screw 12, preferably made adjustable, which stop-screw is acted upon at intervals, as when it is desired to supply a clamp with a needle, by a bunter 13 at the outer end of a bunter or slide-bar *w*, fitted to slide in suitable guide-holes in the frame-work A, the said bunter or slide-bar being moved longitudinally to the left in Fig. 8, to act upon and open the spring plate or jaw, referred to, of the clamp, by the cam *b* on the cam-wheel C, a spiral spring *w′*, surrounding the said bar and acting against a collar w^2 thereon, normally serving to retract the same.

To release and finally discharge the needle from the clamp of the carriage when the rivet shall have been upset, I provide the machine with a second slide-rod w^6, or auxiliary opening device, which is pushed forward to contact with a screw 12 by the cam 40 (see Fig. 3) on the cam-wheel $B'^{\times}$, before described, the spring w^7 retracting the said auxiliary opening device. The bunter 13, in striking the stop-screw 12 to open the jaws in succession, passes through a hole 14 in the body-plate $d^{\times}$.

Each bed d^3, pivoted, as described, at one end on a pin 7, is provided with a gage b^2, made adjustable thereon by a screw b^3, the said gage receiving against it the end N^2 of the needle. Each bed d^3 also has connected to it by a screw b^5 a gage b^4 for the latch, as the latter, previously provided with a hole, is set into the usual groove between the opposite side walls thereof, as in Figs. 44 and 45, to be drilled by the drill *e*, held, in the usual manner, at the end of a rotating spindle *e′*, provided with a belt-pulley e^4 and having its bearings in a block e^2 (shown as pivoted at e^3) in uprights e^8. The rear end of the spindle is shown as provided with a collar e^6, with which co-operates the bifurcated ear of a lever e^7, pivoted at 22, the said lever (shown separately in Figs. 13 and 14) having a cam e^9, which, in the rotation of the cam-wheel C, is acted upon by the cam projection *c* to cause the said spindle to be gradually moved forward and the drill to drill a hole, as shown in Fig. 46, in the walls of the needle and in line with the hole in the latch, a suitable spring e^5 (see Fig. 9) normally acting to retract the said spindle.

Each bed-block d^3 at its free end has an adjusting-screw 25, the end of which enters a threaded hole in the frame $d^{\times}$, a spiral spring 26 (but one spring shown in Fig. 32) interposed between the said bed-block d^3 and the frame $d^{\times}$ normally acting to push out the free end of the said block against the head of the screw, the said screw and spring enabling the hole to be drilled more or less distant from the back of the needle.

Each bed-block d^3 is depressed or concaved at 27 (see Fig. 41) to permit the heading-tool B^6 to come close to the wall of the needle, the lip 8 opposite the recesses 27 being also partially cut away to enable the heading-tool $B^{6\times}$ to come up close to the needle at that side.

The frame $d^{\times}$ at its side next the rivet-wire-feeding devices is cut away, as at 28, to enable the said devices and the cutter, to be described, to work close to the needle. The frame $d^{\times}$ is provided with four like radial slots 128, (see Figs. 38 and 39, where one such slot is shown,) in which are placed like radially-movable supports *g*, having lips *g′*, which lips are engaged and the supports moved alternately out and then in by the cam projections 29 30, forming part of a stationary collar 31, surrounding the hub *d′* loosely, the said collar, as shown, having a lip 32, the ends of which (shown in Fig. 19) rest on the frame-work, (see Fig. 1,) the said shoulders preventing the rotation of the said collar with the carriage D.

Each support *g* is shown as beveled or inclined, as at 33, (see Figs. 30 and 42,) and slotted, as at 34, (see Figs. 29 and 31,) the said slot being for the passage of the drill *e*. Each beveled portion 33, in the outward movement of a support, acts against an adjusting-screw 35 in a plate 36, attached to the frame $d^{\times}$ by suitable screws, the said support *g* near its outer end bearing against one side of and sustaining the needle at that side wall opposite that at which the drill *e* enters the needle, the said support sustaining the needle at its side not only while being drilled, but also while the rivet-wire is being inserted, the supports being withdrawn in succession by the action of the cam projection 30 on the lug *g′* just before the rivet is to be upset or headed. In Fig. 32 two of the supports are shown as retracted and two as pushed out.

The end of the hub *d′* is provided with four clutch-teeth, as shown in Figs. 1, 32, and 34, one tooth for each clamp.

To lock the carriage after each quarter-rotation and while the different operations on the needle are being effected, I have provided a locking device (shown as a bolt h^7) which is acted upon by the cam d, before described, so that the said bolt enters one of the holes h^8 in the frame $d^\times$. Preferably the bottom of the groove (see Figs. 33 and 37,) intersecting the said holes will be inclined between one and the next hole h^8, so as to enable the said bolt h^7 to get a start inwardly to surely enter each hole as the carriage in its movement brings a hole opposite the bolt. The bolt h^7, surrounded by a spiral spring h^9 to aid in retracting it, is actuated by the cam d. As this bolt is forced into each hole h^8 firmly, so as to avoid any possible wabble of the carriage, it has to be started back with a blow when it is to be retracted. To do this I have provided a hammer-rod h^{12}, mounted in a bearing h^{13}, attached by screws h^{14} to the frame-work, the said hammer-rod being acted upon by a cam h^{15} at the inner side of the gear B.

The rivet-wire-feeding device is shown as a pair of jaws m n, jointed together by means of a pivot-pin 41, provided with a transverse hole, (see Fig. 12,) through which the rivet-wire o, to be used to secure the latch in place in the needle, may be fed. The jaw n is fitted to and adapted to slide longitudinally in a suitable groove in a metal block H, connected to or forming part of the frame-work. The pivot-pin 41, referred to, also constitutes the fulcrum, about which may turn the cutter-carrier r, provided at its forward end with a suitable blade or cutter r', the said cutter-carrier having an attached spring r^2, which normally acts to keep the cutter away from the rivet-wire. The rear end of the jaw m has an adjusting-screw m', which, in the rotation of the cam C, is acted upon by the cam projection 5 to cause the jaws to grasp the rivet-wire, as when the same is to be fed forward, and its free end, which is to constitute a rivet, is to be inserted through the drilled hole in the sides of the needle and through the latch.

The wire o, which is to be fed, as described, to constitute the rivets, is led from a suitable reel under a spring n^{10}, attached to a slide-bar n^{12}, said bar being adapted to be reciprocated longitudinally, the gib n^{13}, attached by the screws n^{14}, serving as one of the guides therefor. The slide n^2 has a screw 43, which, in the rotation of the cam C, is acted upon by the cam projection 6 to reciprocate the said bar in one direction, or to the right in Fig. 1, a spring n^5 (shown in Fig. 2) moving the said bar in the opposite direction. The bar n^{12} has a regulating-screw 42, which when the bar is moved by the said spring comes in contact with a lug 50 at the lower side of the jaw-lever m, (see Fig. 9,) the position of the said screw on the slide n^{12} controlling the length of the rivet t. The jaw member n has at its rear end an adjusting-screw n^8, which, in the rotation of the cam C, is struck by the cam projection a, the latter cam moving the jaws m n forward while grasping the wire between them, the screw referred to being provided to accommodate for greater or less throw of the jaws. The spring m^8 (shown in Fig. 9) moves the jaws and cutter to the left in opposition to the cam a, referred to. The cam 4 on the cam-wheel C serves to actuate the cutter-carrier r and cause the cutter to at the proper time cut off the rivet-wire close to the outer wall of the needle. Part of the jaw m acts as one member of the rivet-wire cutter. The jaws m n are opened just before the said jaws start back, or to the left in Fig. 1. The spring n^{15} is a little stronger than the spring m^8.

The movement of the slide-bar n^{12}, having the wire-holding or friction device n^{10}, to the right in Fig. 9 and to the left in Fig. 1, is derived from the spring n^{15}, the extent of such movement being controlled by the depth of the cam 6. While the spring n^{15} acts to move the slide-bar n^{12}, the regulating-screw 42 acts against the lug 50, the jaws m n are open, and enough wire for the rivet then to be inserted in the hole drilled in the needle extends beyond the jaws m n. As soon as the screw 43 contacts with the bottom of the cam 6 the movement of the said slide stops, and at the same time the cam 5 acts on the screw m' to close the jaws m n on the rivet-wire as the said jaws are being moved longitudinally by the cam a, the jaws at such time clamping the rivet-wire between them and drawing enough of said wire under or from the friction device n^{10} to make the second rivet to be inserted. When the jaws are again opened, the spring m^8 retracts or moves the jaws m n to the left in Fig. 9, and after a short movement the lug 50 strikes the regulating-screw 42, and thereafter the inclines of the cam 6 act on the screw 43 to move the slide-bar n^{12} to the left, the spring m^8 causing the jaws to follow in the same direction.

The jaw members and the cutter and the means for feeding and controlling the wire are and may be all substantially as in my said application, Serial No. 323,907.

In the operation of the machine, a needle having been properly inserted in a clamp of the carriage then uppermost, and a latch previously drilled having been inserted in the usual slot of the needle, the needle while so clamped snugly is drilled by moving the drill-spindle forward, and the hole having been made the drill is retracted. The first needle having been drilled, the carriage is given a quarter-rotation, a second needle is put into the second clamp ready to be drilled, as described, and while the second needle is being drilled the wire-feeding jaws are moved forward to insert the rivet-wire into the hole previously drilled into the first needle referred to, and the said rivet is cut off. While the drill and wire-feeding devices are being retracted the carriage is again moved a quarter-turn, a third needle is again placed in position in the third clamp to be drilled, as

before, and the second needle to be drilled is provided with a rivet, the first needle to be riveted being held in the clamp at the bottom of the carriage when no operation is performed upon it. While the fourth needle is being drilled, the first needle, previously drilled and provided with a rivet, is brought into position opposite the heading tools or devices B^6 $B^{6\times}$, which are thrown forward together to act upon the opposite ends of the said rivet and properly head or upset it, so that it will maintain its position in the needle and retain the latch in place, and during this operation the third needle which was drilled is being provided with a rivet. While this fourth needle is being drilled, and just after the first needle has its rivet headed, the clamp holding the said first needle which was drilled comes opposite the clamp-opening rod or bar w^6, which is thrown forward to act upon the screw 12 of the clamp-spring holding the said first needle, pushing the said clamp-spring aside and letting the needle drop from the carriage into a suitable receptacle.

The gages herein shown and described for positioning the end of the needle and for positioning the latch are the same as in my said application.

The end of the needle may be provided with the usual hook, if desired, before the needle is drilled.

After the latch has been properly secured the outer end thereof, employed for handling, will be broken off and the latch will be finished in usual manner.

I do not desire to limit my invention to the exact shape of the movable carriage or to the devices employed to actuate it step by step.

It is obvious that the carriage having the clamps might be stationary and a frame having the drill and the rivet-wire-feeding device and heading devices might be moved step by step, as practiced in some screw-making machines.

I claim—

1. An organized machine for providing knitting-machine needles with latches, it comprehending a carriage or bed provided with a series of clamps to hold the needles to be drilled, a drill-spindle and drill to drill a hole in the needles in succession, jaws to grasp and insert a rivet-wire into the said holes, headers to head the rivets, means to reciprocate the said headers and to actuate the drill-spindle and the rivet-wire-feeding jaws and to change the relative positions of the carriage or body on the one hand and the said spindle, rivet-wire feeding and heading devices on the other hand, whereby several needles may be simultaneously acted upon, substantially as and for the purposes set forth.

2. A carriage or bed and a series of clamps connected thereto, composed each of a bed, as d^3, and a clamping-spring jaw, combined with means to adjust the said bed d^3 and to automatically open the clamping-jaws, to operate substantially as described.

3. The carriage, combined with a bed, as d^3, a co-operating clamping-spring, a support g, notched, as described, to rest against one side of the needle while the latter is being drilled, and means to actuate the said support, substantially as described.

4. The carriage, the bed d^3, attached thereto, having a lip, as 8, combined with the support g, notched at one end, and beveled, as at 33, and with the screw 35, to operate substantially as described.

5. The carriage, the attached bed d^3, and the clamping-jaws d^5 d^6, combined with the adjusting-screw 12, the bunter or rod, and means to actuate it to press the portion d^5 of the said clamping-jaw away from the lip 8, substantially as described.

6. The carriage having a series of needle-clamping beds and having a hub, as d', toothed, as described, combined with the ratchet-toothed hub t^3, having the cam projection t^5, splined, as described, on a shaft a^9, and with the pin h^4, to operate substantially as described.

7. In a machine for providing knitting-machine needles with latches, a carriage having a series of needle-clamping devices, combined with rivet-wire-feeding jaws and heading-tools, and means to actuate them to feed the rivet-wire and upset or head the same in the needle, substantially as described.

8. The clamping-bed to hold the needle, and the heading-tools, combined with the compound cams, substantially as described, to actuate the said heading-tools, a portion of the said cams being adjustable, to operate as and for the purpose set forth.

9. In a machine for providing knitting-machine needles with latches, a movable carriage provided with a series of holes h^8 and a locking device, and means to actuate it to lock the said carriage in place, combined with a hammer-rod h^{12} and means to actuate it, to operate substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN J. JENKINS.

Witnesses:
N. P. HUNT,
SAM C. KENNARD.