No. 820,980. PATENTED MAY 22, 1906.

A. E. MILLER.

BROOM SEWING MACHINE.

APPLICATION FILED OCT. 10, 1900.

8 SHEETS—SHEET 1.

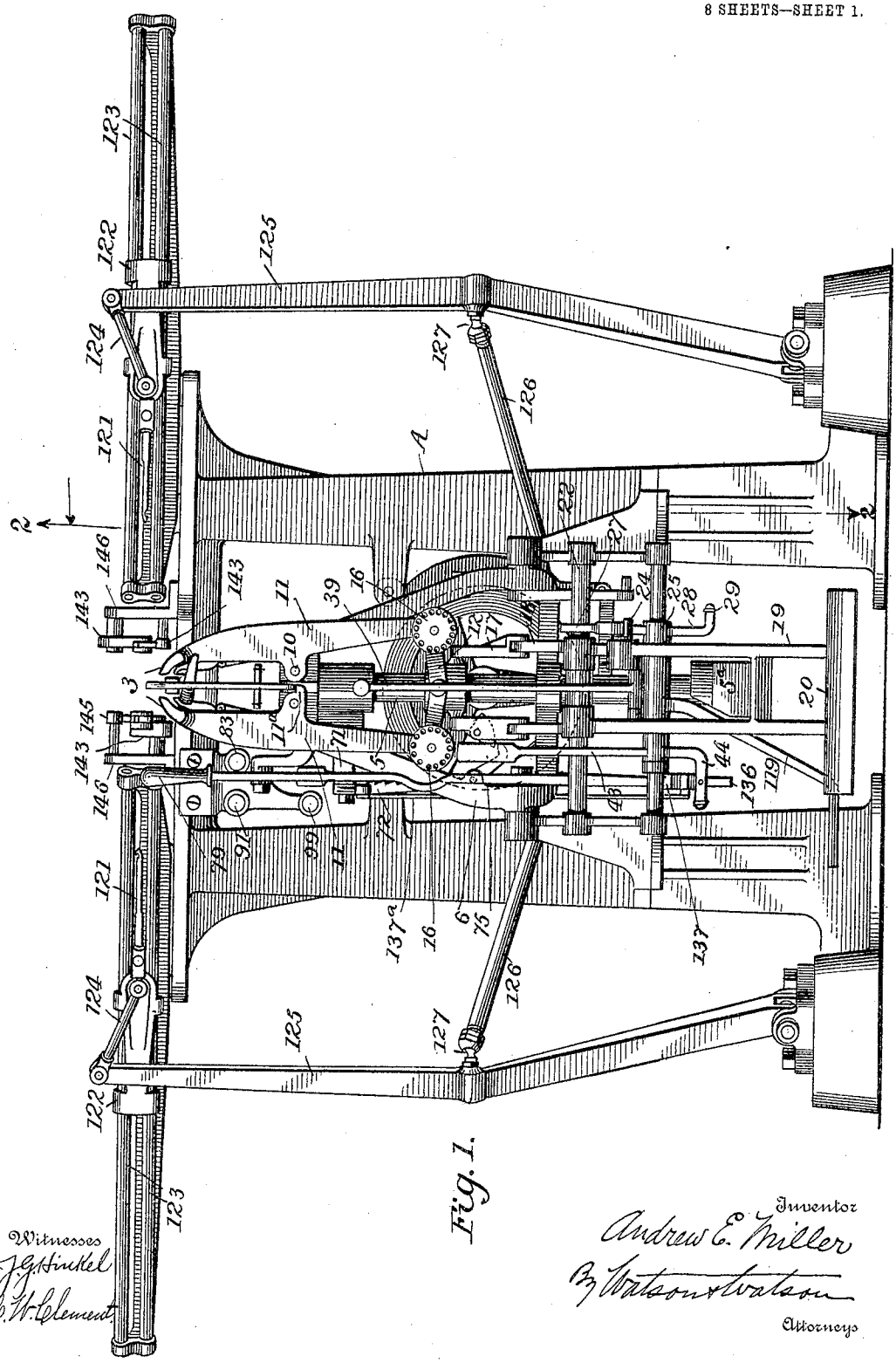

Fig. 1.

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Fig. 18.

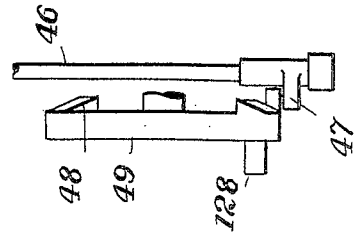

Fig. 2.

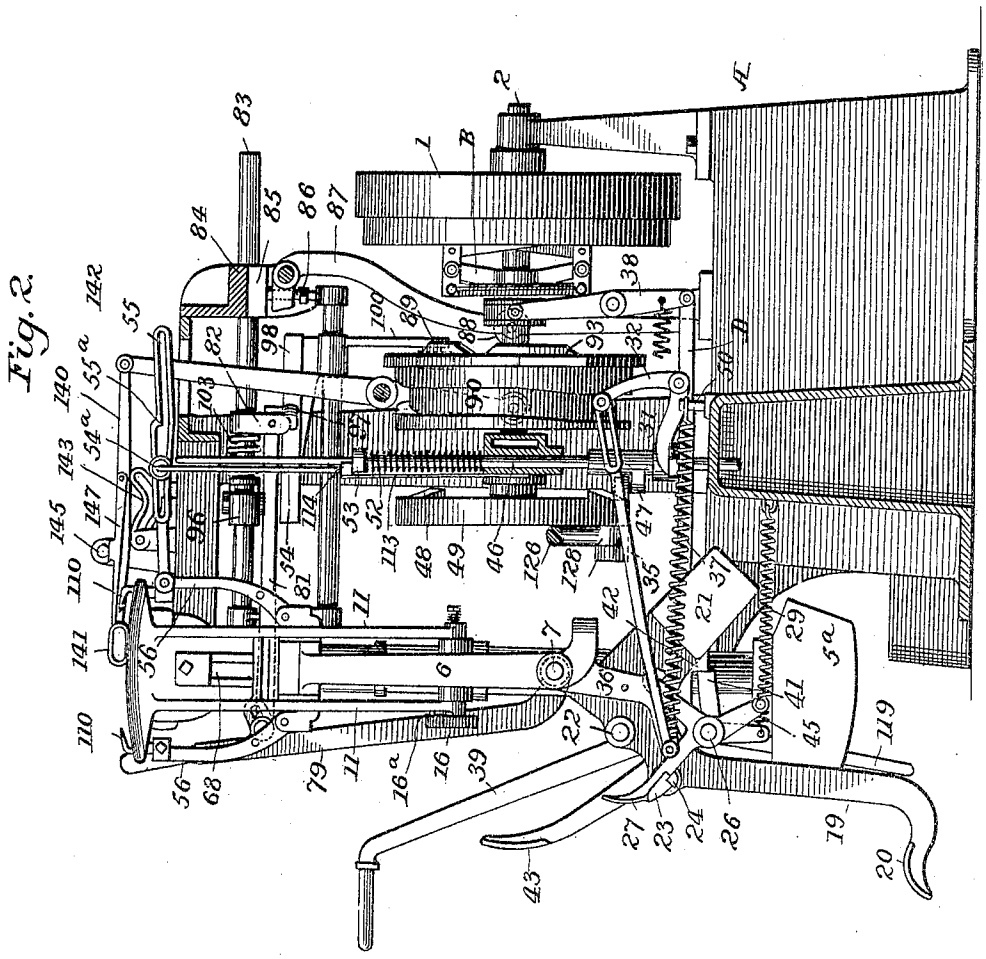

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Fig. 3.

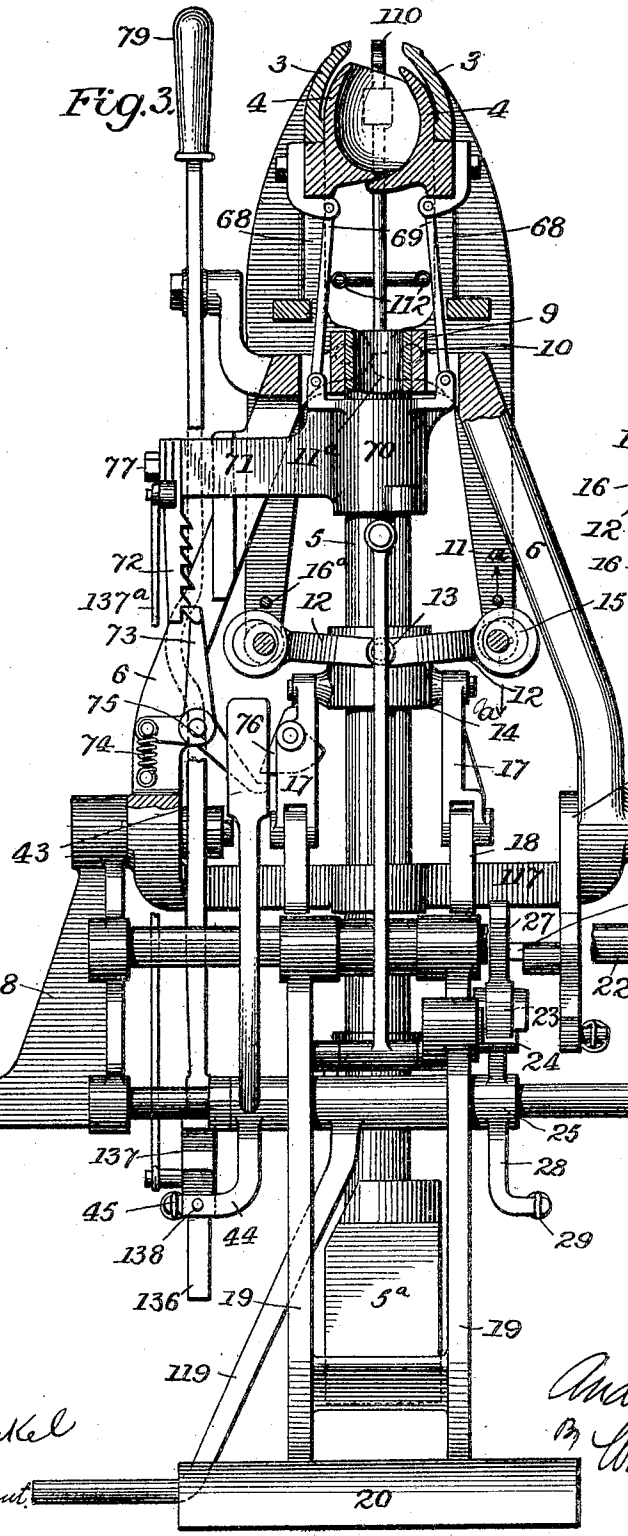

Fig. 3a.

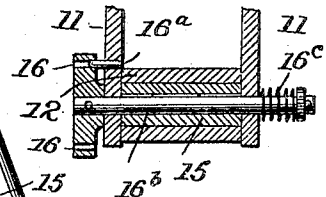

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Fig. 4.

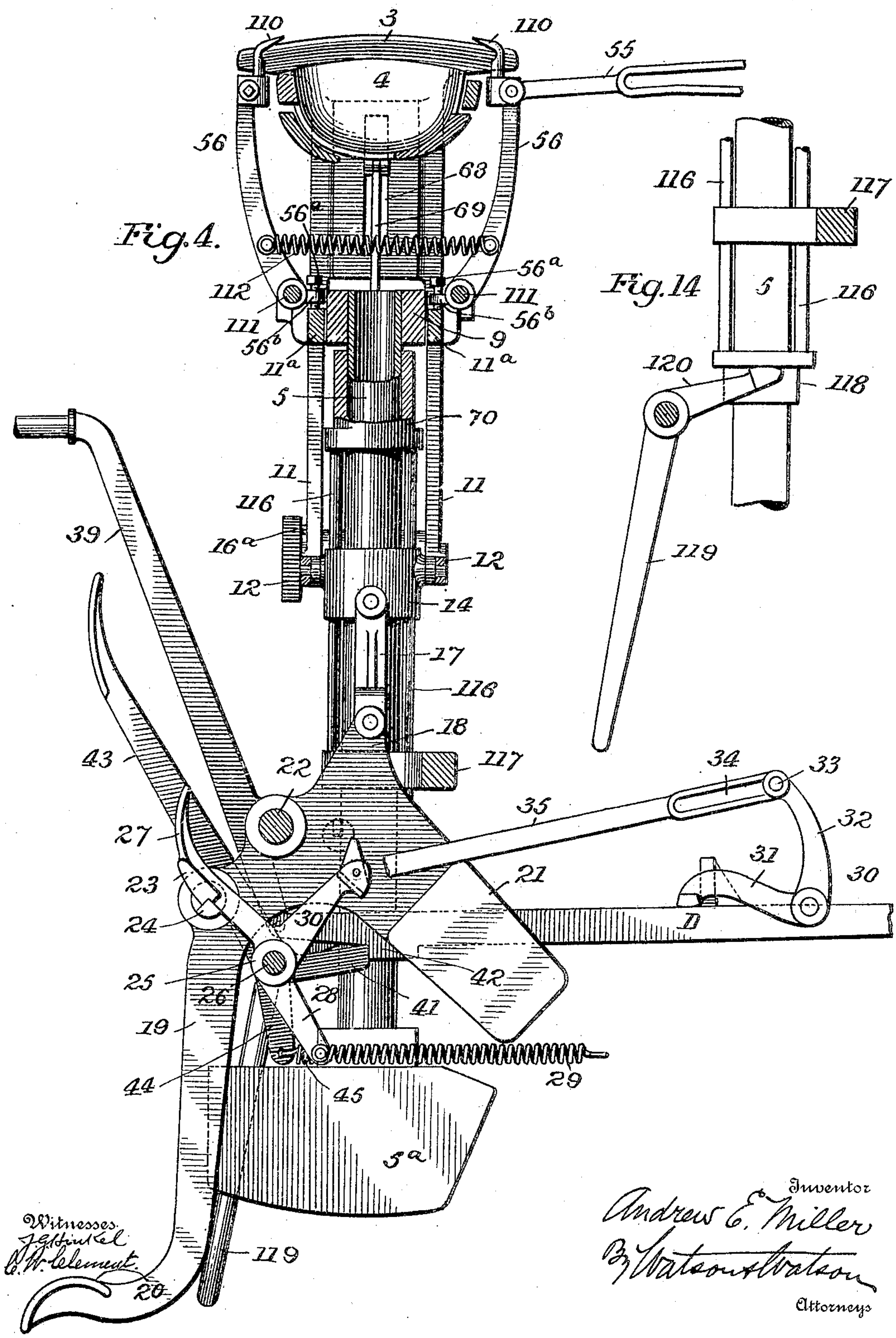

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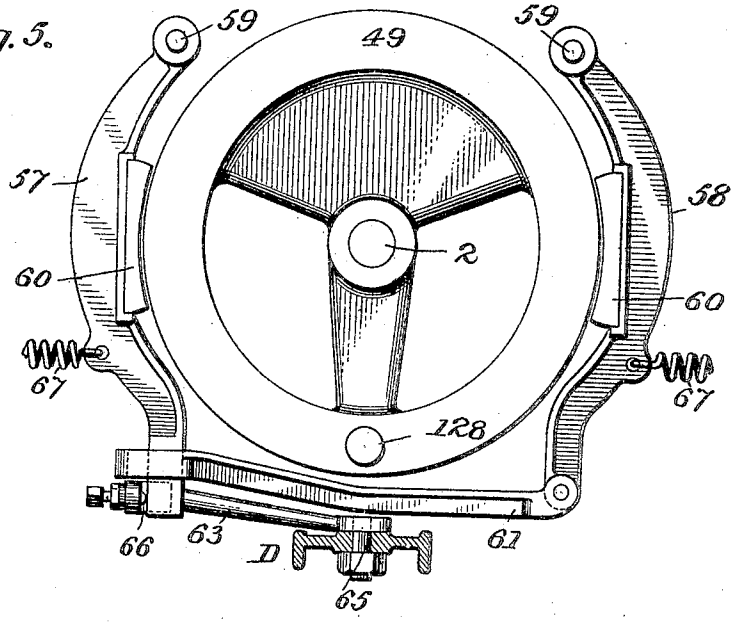
Fig. 5.



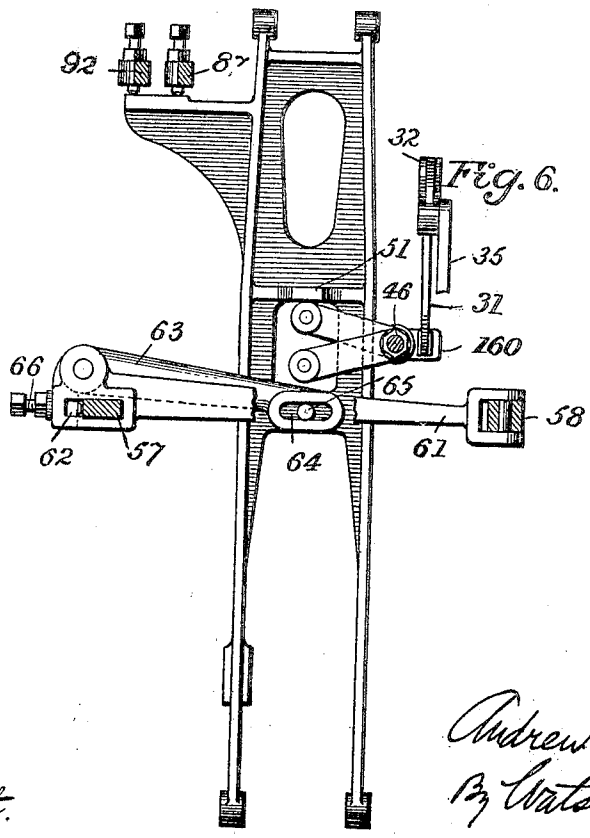


Fig. 6.

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Fig. 7.

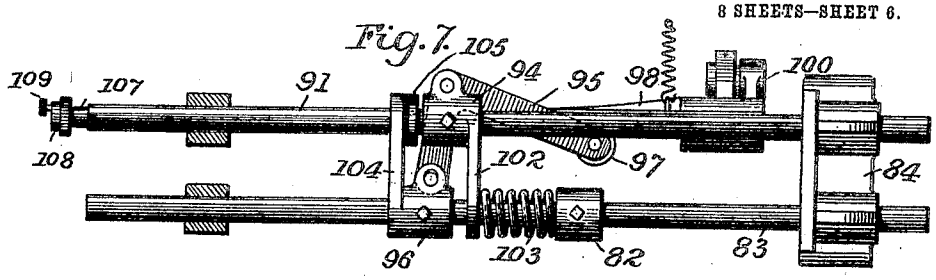

Fig. 8.

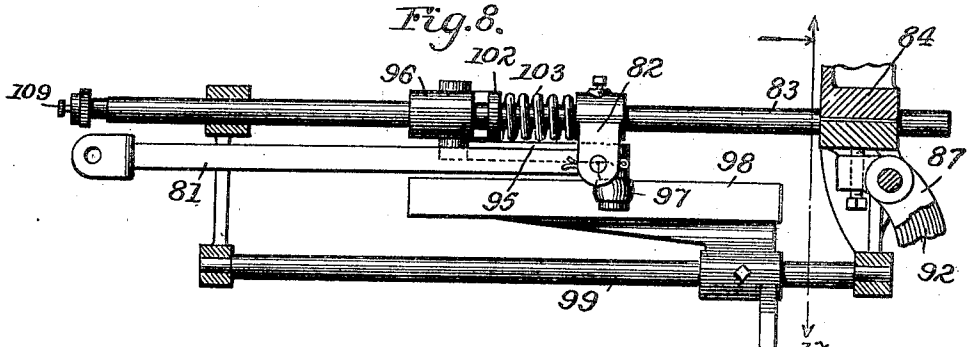

Fig. 10.

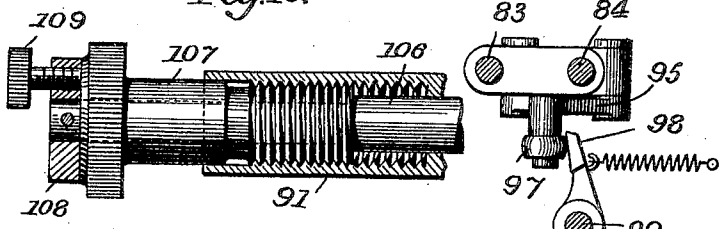

Fig. 9.

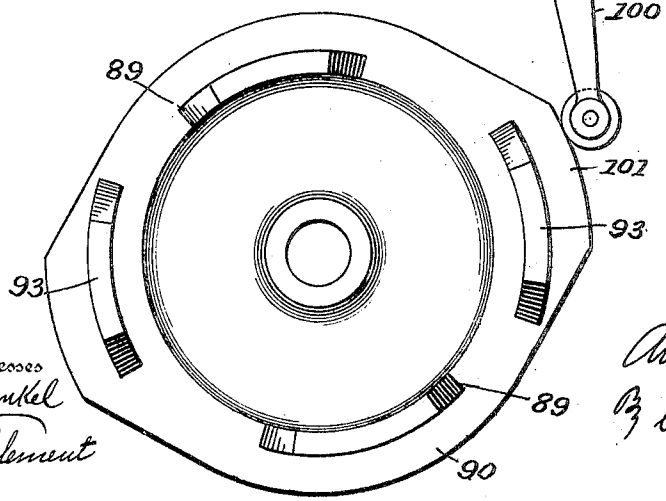

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Fig. 11.

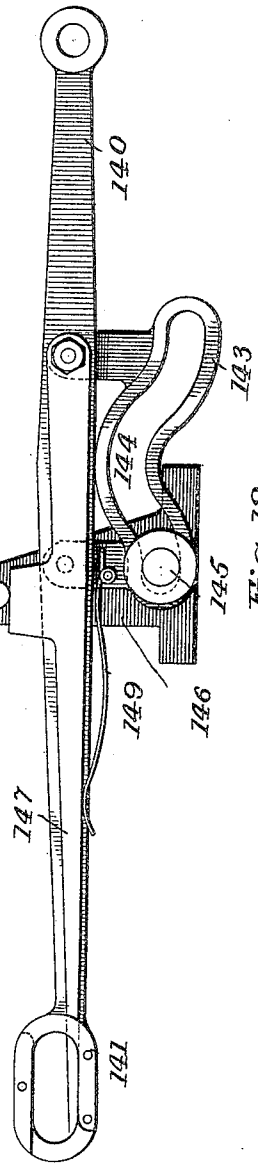


Fig. 12.

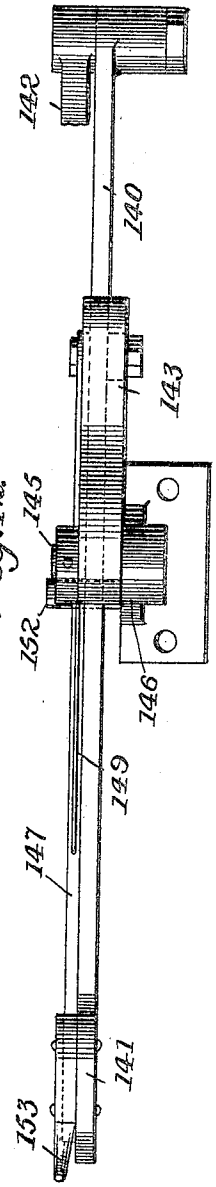
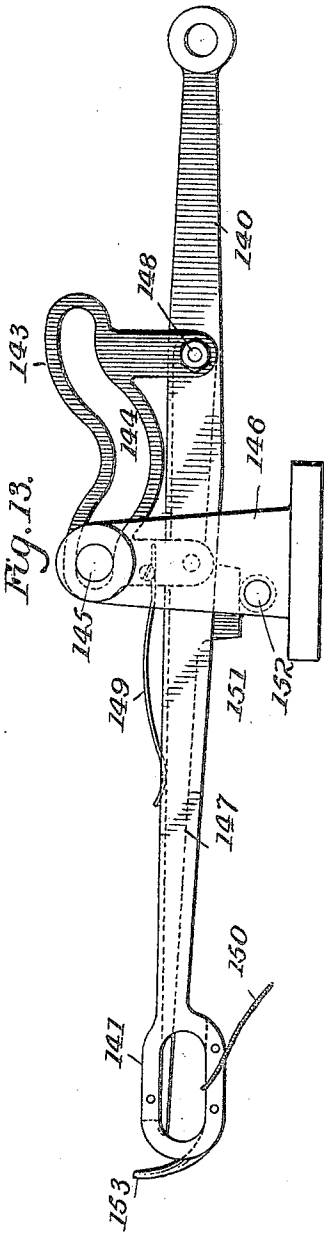


Fig. 13.



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8 SHEETS—SHEET 8.

Fig. 15.

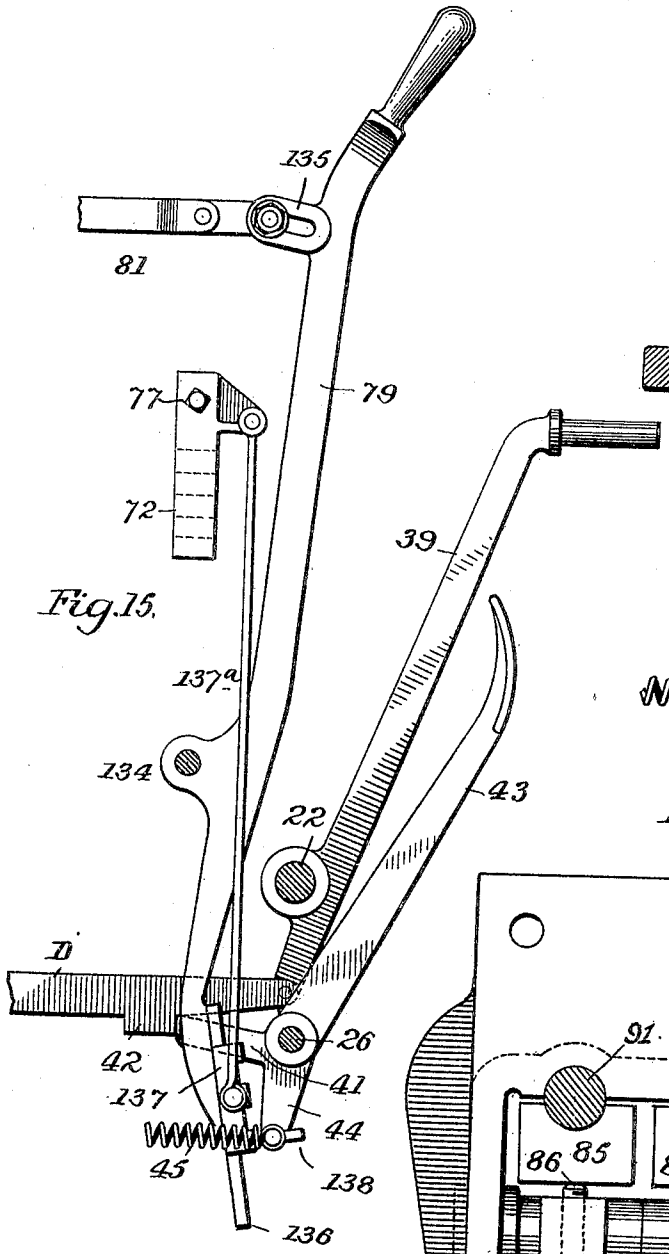


Fig. 16.

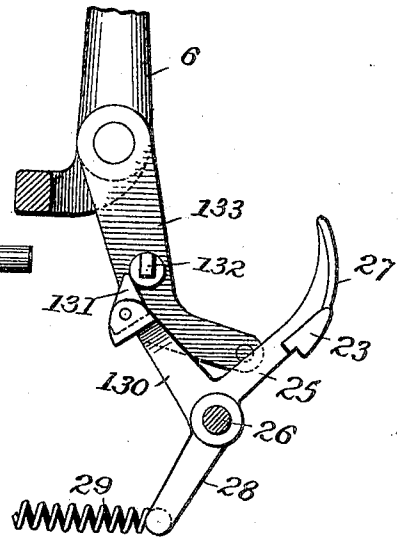


Fig. 17.

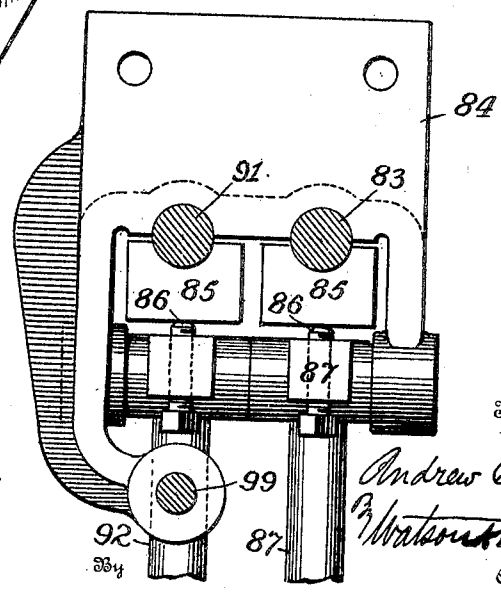
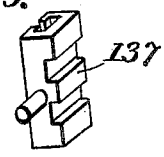


Fig. 19.



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UNITED STATES PATENT OFFICE.

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BROOM-SEWING MACHINE.

No. 820,980. Specification of Letters Patent. Patented May 22, 1906.

Application filed October 10, 1900. Serial No. 32,574.

To all whom it may concern:

Be it known that I, ANDREW E. MILLER, a subject of the Queen of Great Britain, residing at the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Broom-Sewing Machines, of which the following is a specification.

This invention relates to improvements in broom-sewing machinery of the type illustrated in United States Letters Patent No. 618,798, granted to me January 31, 1899.

The several improvements will be fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a broom-sewing machine embodying the present invention. Fig. 2 is a side elevation, partly in section, on the line 2 2 of Fig. 1. Fig. 3 is an enlarged front elevation of the vise-frame and connected parts, portions being shown in section. Fig. 3[a] is a detail. Fig. 4 is a side elevation of the vise-frame, partly in section. Fig. 5 is a face view of the brake-wheel, showing part of the brake-operating mechanism. Fig. 6 is a plan view of parts illustrated in Fig. 5. Fig. 7 is a plan view of the vise-feeding mechanism. Fig. 8 is a side view of the same. Fig. 9 is a view of the cams for operating said mechanism. Fig. 10 is a detail of the device for varying the feed or changing the length of the stitch. Figs. 11 and 12 are side and plan views, respectively, of one of the threading devices. Fig. 13 is a side view of the other threading device. Fig. 14 is a detail of the clamp-raising mechanism. Fig. 15 is a detail of the device for staggering the stitches. Fig. 16 is a detail of the automatic vise-unlocking mechanism. Fig. 17 is a detail, partly in section, on the line 17 17, Fig. 8. Fig. 18 is a view showing the lower end of the vertical rock-shaft with connections for automatically throwing the clutch out of engagement and applying the brake at the completion of each row of stitches. Fig. 19 is a detailed view of the staggering-block and coöperating parts.

The various movable parts of the machine are mounted upon a suitable frame A, which may be of any convenient construction, and upon brackets supported by said frame. Power is applied by means of the driving-pulley 1, which runs loosely upon a shaft 2, and is periodically connected to said shaft by means of a suitable clutch B. Various moving parts are driven from the shaft 2 by connections which will be described hereinafter in their proper order.

Vising mechanism.—The vising mechanism comprises a pair of vise-jaws 3, which grip the broom securely while it is being sewed, and a pair of clamping-jaws 4, which serve to form or shape the broom-head and hold it during its vertical adjustment while the grip of the jaws 3 is relaxed. The vise-jaws 3 are carried by a vise-frame C, comprising a central tubular stem 5, supported by legs 6 6, pivotally carried by trunnions 7, mounted on brackets 8. The tubular stem 5 is arranged in the central plane of the machine between the legs 6 6, and at its lower end it carries a weight 5[a], which tends to hold it in an upright position, Figs. 3 and 4. As shown in Fig. 3, the jaws 3 are pivoted to the head 9 of the vise-frame at 10. The lower ends of the vise-jaw levers 11 are adjustably connected to a pair of toggle-levers 12, said toggle-levers being in the form of yokes, having their inner ends pivotally connected to studs 13 upon the sliding collar 14. It will be evident that when the collar is raised to the position shown in Fig. 3 the vise will be closed, while a downward movement of the collar will draw the lower ends of levers 11 together and open the vise. The vise-levers 11 are in pairs, as shown in Fig. 2, and on the lower end of each pair is mounted an eccentric 15, upon which the corresponding toggle-lever 12 is pivoted. The eccentrics are adjusted by means of hand-wheels 16, each having a series of holes which coöperate with a locking-pin 16[a] upon the vise-lever.

As shown in Fig. 3[a], each hand-wheel 16 is secured to one end of a shaft 16[b], which extends through the levers 11, between which the eccentric is arranged and on which shaft the eccentric 15 is splined. A spring 16[c] is arranged about the shaft between one of the levers 11 and an abutment on projecting end of the shaft beyond said levers and acts to hold the hand-wheel 16 in engagement with the adjacent vise-lever. By moving said shaft 16[b] longitudinally the wheel 16 will be disengaged from the pin 16[a] and can be actuated to rotate the shaft 16[b] and the eccentric 15. When the eccentric is adjusted to the proper position, one of the apertures in said wheel 16 will be in alinement with the pin 16[a]

and the spring 16[c] operate to move the shaft 16[b] longitudinally and again lock the hand-wheel against rotation. It will thus be seen that the eccentrics 15 and their hand-wheels 16 afford a convenient means of adjusting the effective length of the toggle-levers, and thereby adjusting the vise-jaws 3 to adapt the machine to brooms of different thicknesses.

The collar 14 is connected by links 17 with arms 18, which are rigidly connected with a treadle-lever 19, which is operated by a foot-piece or treadle 20, Figs. 2, 3, and 4. The treadle is provided with a weight 21, which constantly tends to raise the foot-piece 20. The treadle-lever is mounted upon a fixed shaft 22. When the treadle is pushed into its lowest position to close the vise-jaws, it is automatically locked and retained in such position by a latch 23, which engages a projecting stud 24 upon the treadle-lever. Latch 23 is carried by a hub 25, which rocks on a shaft 26. The latch is provided with a cam projection 27, which rides over the stud 24 when the treadle is pushed down. Upon the hub 25 is an arm 28, to which is connected a spring 29 for the purpose of holding the latch in engagement with the stud.

Automatic vise-opening.—The latch 23 is operated automatically after each row of stitches to release the treadle and permit the weight 21 to open the vise. An arm 130 on hub 25 is provided with a pivoted extension 131. This extension swings idly in one direction and permits a pin 132 on arm 133 of the vise-frame to pass without effect as the vise-frame is thrown into action. When the vise-frame is released after the last stitch of a row, the vise swings forward and the pin 132 engages extension 131 and raises the latch 23, permitting the weight 21 to open the vise.

Starting and stopping mechanism.—The rear end of the starting-frame D is connected with the starting-clutch B by means of the lever 38 in such manner that the forward movement of the frame causes a rearward movement of the clutch devices which locks the driving-wheel 1 to the shaft 2 and starts the machine. The forward end of the frame D is pivotally connected to a hand-lever 39, swinging on the fulcrum 22, Figs. 1 and 2. The frame D is normally held in its rearmost position by a stop 41, which engages the shoulder 42, Figs. 2, 3, and 4. The stop 41 is rigidly connected with the knee-lever 43 and with an arm 44, to which is connected a spring 45, tending always to hold the stop in engagement with the shoulder. The frame D can be liberated at any moment by pushing the lever 43 rearward, which is usually done by the knee of the operator. When the stop 41 is withdrawn, a spring draws the frame D forward and starts the machine.

The machine is started by pushing the vise-frame rearward. To accomplish this, power is applied to a lever 79, pivoted at 134 and connected by a pin and slot 135 to the vise-frame, Figs. 2, 3, and 15. The lower end of lever 79 is provided with a guide 136, upon which slides a staggering-block 137. Block 137, as shown in Figs. 2 and 15, has alternate elevations and depressions which coöperate with a pin 138, carried by an arm 44, connected to stop 41. It will thus be seen that when the vise is pushed rearward the block 137 will engage the pin 138 and release the frame D, starting the machine. The staggering-block 137 is tied to the broom-dropping rack 72 by a rod 137[a], and its projections and depressions operate alternately on the pin 138 to start the machine in different positions of the vise and stagger the stitches in adjacent rows.

When the machine has finished sewing a line of stitches, it is automatically stopped by devices which throw the clutch out of operation and apply a brake to the running-shaft. A vertically-arranged and vertically-movable rock-shaft 46, Figs. 2, 6, and 18, carries an arm 47, on which is a roller adapted to engage a pair of cam projections 48 on the wheel or disk 49, carried by the forward end of the shaft 2, when said rock-shaft is raised. Upon the lower end of the rock-shaft is an arm 161, carrying the roller 50, which is adapted to engage a part 51 on the frame D and move said frame rearward when shaft 46 is rocked. The spring 52, bearing on the collar 53, tends constantly to raise the rock-shaft 46, which shaft is prevented from rising until the end of the line of stitches is reached by rod 54, controlled by a link 55, connected to one of the pivoted arms 56, which carry the thread-supports 110. The arms 56 are pivoted to the head 9 at 111 and are normally drawn toward each other by a spring 112, Fig. 4. When the vise is open, the arms 56 are thrown out by means of lugs 11[a], formed on one pair of levers 11, and adjustable stops 56[a], carried by said arms 56. These adjustable stops are short threaded pins, which extend through inwardly-extending lugs 56[b] at the lower ends of arms 56. When the vise is closed, the spring 112 draws the arms together until the thread-supports 110 impinge upon the edges of the broom. The adjustment of the thread-supports and of the slotted link 55 therefore depend upon the width of the broom in the machine, and the automatic stoppage of the machine is therefore controlled by the width of the broom in such manner that the last stitch is always at substantially the same distance from the edge of the broom. The rod 54 has a projection which extends into the slot in the link 55. This rod is carried by a leaf-spring 113, and upon the spring is a catch 114, which snaps over the head 53 of the rock-shaft 46 when the rock-shaft is moved to its lowermost position. The link 55 has a shoulder 55[a], Fig.

2, which engages the inturned arms 54ª of rod 54, which end projects into the link 55. As the vise moves forward and immediately after the last stitch shoulder 55ª draws rod 54 forward, releasing shaft 46, which is thrown up by spring 52. A rod 46ª upon the shaft strikes the link 55 and disengages it instantly from rod 54, permitting the vise to move forward, the arms 54ª passing into the rear end of link 55.

The rock-shaft 46 is depressed as the vise is moved to its rearmost position as follows: An elbow-lever pivoted at 30 to the frame of the machine has an arm 31, which engages a projection 160 on the rock-shaft 46 and a vertical arm 32, which has a pin 33, extending into a slot 34 in a link 35, Figs. 2 and 4. The link 35 is connected to an arm 36, extending downward from the vise-frame. Said arm is also connected to a strong spring 37, which moves the vise-frame forward to feed for the stitches.

The operation for starting and stopping the machine is as follows: When the broom has been properly vised, the vise-frame is pushed back by means of the lever 79, which is connected to the vise-frame to carry the broom to the sewing mechanism. When the broom reaches the position for the first stitch, the staggering-block 137 strikes pin in arm 44 and withdraws the stop 41 from the starting-frame D, Figs. 2, 3, and 4. The spring *d* then throws the starting-frame forward and engages the clutch B with the drive-wheel, thus starting the machine. At the same time the lever 31 32 draws down the rock-shaft 46 until the roller on its arm 47 clears the cams 48. The machine is thus automatically started by the mere pushing backward of the vise-frame. As the last stitch is taken the shoulder 55ª of link 55 engages the end of rod 54 and withdraws the catch 114, permitting the spring to raise the rock-shaft 46. The cams 48 then engage the roller upon the arm 47, rocking the shaft and causing the roller 50 upon arm 161 to engage the part 51, thus throwing the starting-frame D rearward and stopping the machine. The stop 41 engages the starting-frame and holds it in its rearmost position until the broom is adjusted for a new seam or a new broom is inserted in the vise.

Braking mechanism.—Referring to Figs. 5 and 6, it will be seen that the brake-wheel 49 is provided with two brake-levers 57 and 58, mounted at their upper ends on fixed pivots 59 and provided with brake-shoes 60. The lower end of lever 58 is pivotally connected with the bar 61, which bar has a slot 62, through which the lower end of brake-lever 57 passes. The bar 61 has pivoted to it the elbow-lever 63, the longer arm of which has a slot 64, into which extends a pin 65, rigidly connected with the starting-frame D. The shorter arm of the elbow-lever has the set-screw which bears against the lower end of the brake-lever 57. The brake-shoes are normally held away from the wheel 49 by springs 67. When, however, the frame D is moved to the rear by the cam 48, the lever 63 is rocked and the brake-shoes are simultaneously engaged with the wheel 49. Thus the clutch is automatically disengaged and the brakes engaged with the running-shaft immediately thereafter. The brakes are retained in engagement with the wheel 49 by the stop 41, Fig. 4, operating on the frame D.

Broom-dropping devices.—The broom is held in the clamps 4, and after each seam is sewed it is dropped a fixed distance to position the broom for the next row of stitches. The broom-clamps 4 are vertically movable in guide-slots 68 in the vise-jaws 3, Figs. 3, 4. The lower ends of the clamps 4 are connected by links 69 with a head 70, sliding on the stem 5. The head 70 is provided with an arm 71, upon which is a depending rack 72, coöperating with the pivoted pawl 73, which pawl is held in normal engagement with the rack by a spring 74. The pawl 73 has an arm 75, which projects into the path of a block 76, pivotally carried by one of the links 17. Each time the links 17 are lowered to open the vise-jaws the block 76 throws back the pawl 73 momentarily and permits the rack 72 and the broom-clamps supported thereby to drop a distance equal to the space between consecutive teeth of the rack. The rack 72 can be removed and a rack having differently-spaced teeth substituted, the racks being removably held in place by the bolt 77.

The head 70, as shown in Figs. 3, 4, and 14, is supported by rods 116, extending downward through the transverse part 117 of the vise-frame into the collar 118, sliding on the vise-shank 5. The treadle 119 has an arm 120 extending under the collar 118. By pushing down the treadle the operator, through the connections named, raises the head 70, the jaws 4, the spacing-rack 72, and other connected parts, including the staggering-block 137, which is connected with the arm 71 by a link 137ª, Figs. 1, 3, and 15.

Feeding mechanism.—It is desirable to be able to vary the lengths of the stitches according to the thickness of the brooms and to meet various requirements of the trade. The present invention includes means for producing stitches of any desired length within certain limits and means whereby the length of stitch can be almost instantly changed. After the broom is clamped the vise-frame is pushed to the rear by handle 79 against the tension of the spring 37, Fig. 2, which tends to throw it forward. The vise-frame is connected by a link 81 to hub or arm 82, rigidly connected to a sliding rod 83, Figs. 2, 7, 8, and 17. The rod 83 slides in a groove in the under side of a bracket 84, and it is alternately

clamped and released by the movement of the block 85, set-screw 86, and lever 87, said lever having a roller 88, which coöperates with a pair of cam projections 89 on a cam-wheel 90. A second rod 91 is similarly gripped and released by means of a lever 92, operated by cam projections 93 on said cam-wheel. The rods 83 and 91 are gripped alternately and released alternately. Upon the rod 91 is a fixed hub 94, upon which is pivoted a lever 95. One arm of the lever is pivotally connected to a hub 96, fixed on rod 83. The other arm carries a roller 97, which bears against a blade 98, carried by a rock-shaft 99. Said shaft is rocked periodically by an arm 100, operated by the projections 101 upon the cam-wheel 90. Upon the hub 94 is an arm 102, through which the rod 83 passes, and between the said arm and the hub 82 is a spring 103. A hub 96, fixed on rod 83, is similarly provided with an arm 104, through which the rod 91 passes. An adjustable stop-collar 105 on rod 91 coöperates with arm 104 to limit the relative movement of the rods.

The operation of the feeding device, is as follows: The lever 100 is rocked twice during each rotation of the cam-wheel 90, and the clamps of each of the rods 83 and 91 are twice tightened and released. While the blade 98 is moved forward, referring to its position in Fig. 8, the rod 91 is clamped and rod 83 is moved to the left, compressing spring 103. As the blade 98 retreats the rod 83 is clamped and rod 91 released, which permits spring 103 to expand and push arm 102 and rod 91 to the left until stop 105 is intercepted by the arm 104. The length of stitch is regulated by the position of stop 105. This stop is connected to a rod 106, Fig. 10, passing through the center of rod 91. The end of rod 106 is reduced and upon it is mounted the threaded sleeve 107, which turns in the threaded opening in the end of rod 91. Upon the end of rod 106 is a collar 108, in which is a set-screw 109, adapted to lock the sleeve 107 and hold it in adjustment. A knurled ring is provided for turning the sleeve 107, and by means of said sleeve the length of stitch may be instantly varied. It will be evident that the blade 98 has a uniform forward-and-backward movement, referring to its position in Fig. 8, caused by the cams 101. The lever 95 follows the blade 98 in its rearward movement until stopped by the stop 105, after which the blade 98 leaves the lever 95 and roll 97 and moves to the rear to the end of its stroke. The parts 95 and 98 are therefore separable and, in fact, separate more or less at each stroke of the part 98, depending upon the position of the stop, and therefore upon the length of the stitch. The part 98 may be termed a "driving" member and the part 95 a "driven" member. The driven member 95 is connected positively to the vise through the hub 96, rod 83, hub 82, and link 81.

Sewing and threading mechanism.—The needles 121 are carried in heads 122, sliding on a pair of guide-rods 123. The needle-heads are reciprocated by the connecting-links 124, rocking arms 125, and links 126, said links 126 being connected by universal joints 127 to the rocking arms. The inner ends of the links 126 are jointed to a common crank-pin 128 upon the brake-wheel 49. The mechanism for operating the needles is practically the same as that shown and described in my patent above mentioned. The needle-threading devices are shown particularly in Figs. 1, 2, 11, 12, and 13.

Referring to Figs. 12 and 13, which illustrate the right-hand threading device, 140 indicates an arm or lever having at its forward end an eye 141, its rear end being jointed to cam-lever 142, the lower end of which carries a roll which runs in a cam-groove in the cam-wheel 90. Rigidly connected with the arm 140 is cam-piece 143, having a serpentine slot 144, into which projects a fixed pin 145 on the bracket 146. A thread-clamping finger 147 is pivoted to the arm 140 at 148 and extends across the eye 141. This finger is constantly pressed downward by a spring 149, which gives it a tendency to clamp the thread 150 against the lower wall of the eye. When the threading-arm is moved to its rearmost position, a foot 151 on the clamping-finger engages and rests upon a fixed pin 152 on the bracket 146, thus raising the forward end of the finger to the upper side of the eye. The shape of the cam-slot 144 is such that the foot 151 descends upon the rest 152 during the last portion of the rearward movement of the arm. When the arm starts to move forward, it begins to rise, the foot 151 is raised from its support, permitting spring 149 to press the finger and clamp the thread. During the balance of the forward movement of the arm and the like part of its rearward movement the thread is held in the eye while it is carried around and engaged with the needle. The eye 141 is provided with a hook or support 153, in which the thread is placed by the operator before the first stitch is taken. The left-hand threading device (illustrated in Fig. 11) is constructed and operated in the same manner as the right-hand device, with the exception that its parts are inverted and it has no thread-support, such as 153.

The general operation of the machine is similar to that of machines heretofore invented and constructed by me and described, for instance, in Letters Patent No. 618,798, previously referred to.

The operations of the particular improvements constituting the present invention have been referred to in the foregoing detailed description, and further allusion thereto may therefore be omitted.

It will be obvious that various modifications and mechanical equivalents may be

substituted for the devices described, and such are included within the spirit and scope of my invention and intended to be covered by the following claims.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a broom-sewing machine, the vise-feeding mechanism comprising a pair of relatively movable rods to one of which the vise is connected, means for alternately holding and releasing said rods, means for imparting movement to each rod when released and coacting devices connected with said rods whereby each rod is given the same extent of movement.

2. In a broom-sewing machine, the combination with sewing mechanism, and a vise, of means for feeding the vise intermittently to the sewing mechanism comprising a pair of feed-rods to one of which the vise is connected, means for moving said rods alternately step by step, and a stop arranged to limit the relative movement of the rods.

3. In a broom-sewing machine, the combination with sewing mechanism, and a vise, of means for feeding the vise intermittently to the sewing mechanism comprising a pair of feed-rods to one of which the vise is connected, means for moving said rods alternately step by step, a stop arranged to limit the relative movement of the rods, and devices for adjusting the stop to vary the length of stitch.

4. In a broom-sewing machine, the combination with sewing mechanism and a vise, of a pair of rods to one of which the vise is connected, a stop carried by one of said rods, a spring for moving one of the rods until intercepted by the stop, means for positively moving the other rod, and means for clamping said rods during their periods of rest.

5. In a broom-sewing machine the combination with sewing mechanism, and a vise, of a pair of parallel feed-rods to one of which the vise is connected, mechanism for moving said rods alternately step by step, connections between said rods whereby each is given the same extent of movement, and means for clamping said rods during their periods of rest.

6. In a broom-sewing machine the combination with sewing mechanism, and a vise, of a pair of parallel feed-rods to one of which the vise is connected, mechanism for moving said rods alternately step by step including connections between said rods whereby the movable rod is actuated by devices connected with the stationary rod, and means for clamping said rods during their periods of rest.

7. In a broom-sewing machine, the combination with sewing mechanism, and a vise, of a pair of rods to one of which the vise is connected, an adjustable stop carried by one of said rods, a spring for moving one of the rods until intercepted by the stop, means for positively moving the other rod, and means for clamping said rods during their periods of rest.

8. In a broom-sewing machine, the combination with sewing mechanism, and a vise, of a pair of parallel rods to one of which the vise is connected, means for imparting to said rods an alternate step-by-step forward movement, said means including an elongated vibrating blade 98 adapted to operate the feeding mechanism throughout its travel.

9. In a broom-sewing machine, the combination with sewing mechanism, and a vise, of vise-feeding mechanism comprising a rod to which the vise is connected, a second parallel rod, an arm on one of said rods, an adjustable stop on the second rod arranged to coöperate with said arm, a spring tending to move said rods relatively, a lever arranged to move said rods relatively in opposition to the spring, and means for gripping the rods alternately during their periods of rest.

10. In a broom-sewing machine, the combination with sewing mechanism, and a vise, of vise-feeding mechanism comprising the rods 83 and 91, the adjustable stop on said rod 91, a spring surrounding said rod 83, an arm on rod 83 coöperating with said stop, an arm on said rod 91 coöperating with said spring, an elbow-lever arranged to move said rods relatively and compress said spring, and means for gripping said rods alternately to hold them during their periods of rest.

11. In a broom-sewing machine, the combination with sewing mechanism, and a vise, of a vise-feeding mechanism comprising a pair of parallel rods, means for moving said rods alternately, and an adjustable stop to vary the relative movement of said rods, said stop having, for its adjusting means, a bar within the rod, a sleeve on said bar having a threaded portion engaging a threaded socket in the rod, and means for locking said sleeve to secure any desired adjustment.

12. In a broom-sewing machine, a clutch, means tending to throw the clutch into action to start the machine, a device for locking the clutch out of action, a vise, a block movable with the vise-frame and having staggered surfaces adapted to engage said locking device, and broom-dropping mechanism connected to said block and adapted to move the latter relatively to the locking device.

13. In a broom-sewing-machine, an automatic stopping mechanism, comprising means for throwing off the power and applying the brake, in combination with a part adapted to bear on the edge of the broom during the sewing operation, and a connection between said part and the stopping mechanism, for the purpose set forth.

14. In a broom-sewing machine, a part adapted to impinge on the edge of the broom

during the sewing operation, in combination with automatic stopping mechanism connected with and brought into action by said part, whereby the last stitch made before stopping is placed in proper relation to the edge of the broom.

15. In a broom-sewing machine, the combination of a vise, pivoted binder-supports arranged to bear upon the edges of the broom during the sewing operation, automatic stopping mechanism, and a connection between said mechanism and one of said binder-supports, whereby the time of stopping is governed by the position of said support.

16. In a broom-sewing machine, the combination of a clutch, a vertically-movable rock-shaft having an arm adapted to throw the clutch out of action, cams arranged to rock said shaft while in one of its positions, a spring tending to throw the shaft into position to be rocked by the cams, a latch holding said shaft out of said position, a binder-support, and means connected with said support for releasing said latch, for the purpose set forth.

17. In a broom-sewing machine, the stopping mechanism comprising the vertically-movable rock-shaft, a spring and latch therefor, a binder-support, a link connected with said support and provided with a shoulder adapted to operate the latch, and the extension of the rock-shaft adapted to release the latch from said shoulder.

18. In a broom-sewing machine, the combination with the sewing-needles, of the threading devices each comprising a cam-lever, an arm pivotally connected to said lever, a cam rigidly connected to said arm, a fixed pin or guide coöperating with said cam, a thread-clamping finger pivotally connected to the arm, a spring for moving said finger in one direction to clamp the thread, and a fixed stop against which the finger abuts to unclamp the thread.

19. In a broom-sewing machine, a threading device comprising the cam-lever, an arm pivotally connected to said lever at one end and having an eye in its opposite end, a cam-piece rigidly connected to said arm and provided with a cam-slot, a fixed guide coöperating with said cam-slot, a finger pivoted to said arm and extending across the eye, a spring arranged to move said finger in one direction to clamp the thread in the eye, and a fixed stop against which the finger abuts to unclamp the thread.

20. In a broom-sewing machine, the combination of a pair of pivoted vise-jaws, toggle-levers for closing said jaws, and means for varying the effective length of the toggle-levers whereby the degree of closing of the jaws may be varied.

21. In a broom-sewing machine, the combination of a pair of pivoted vise-jaws, toggle-levers for closing said jaws, and adjustable connections between said toggle-levers and the lower ends of the jaws whereby the degree of closing of the jaws may be varied.

22. In a broom-sewing machine, the combination of a pair of pivoted vise-jaws, toggle-levers for closing said jaws, eccentric pivot-pins between said levers and jaws, and means for adjusting said eccentrics to vary the degree of closing the jaws.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW E. MILLER.

Witnesses:

ANNA J. GRIM,

HAMILTON CASSARD.