No. 677,591. Patented July 2, 1901.

H. S. PAGE.

BROOM SEWING MACHINE.

(Application filed July 9, 1898.)

(No Model.) 3 Sheets—Sheet 1.

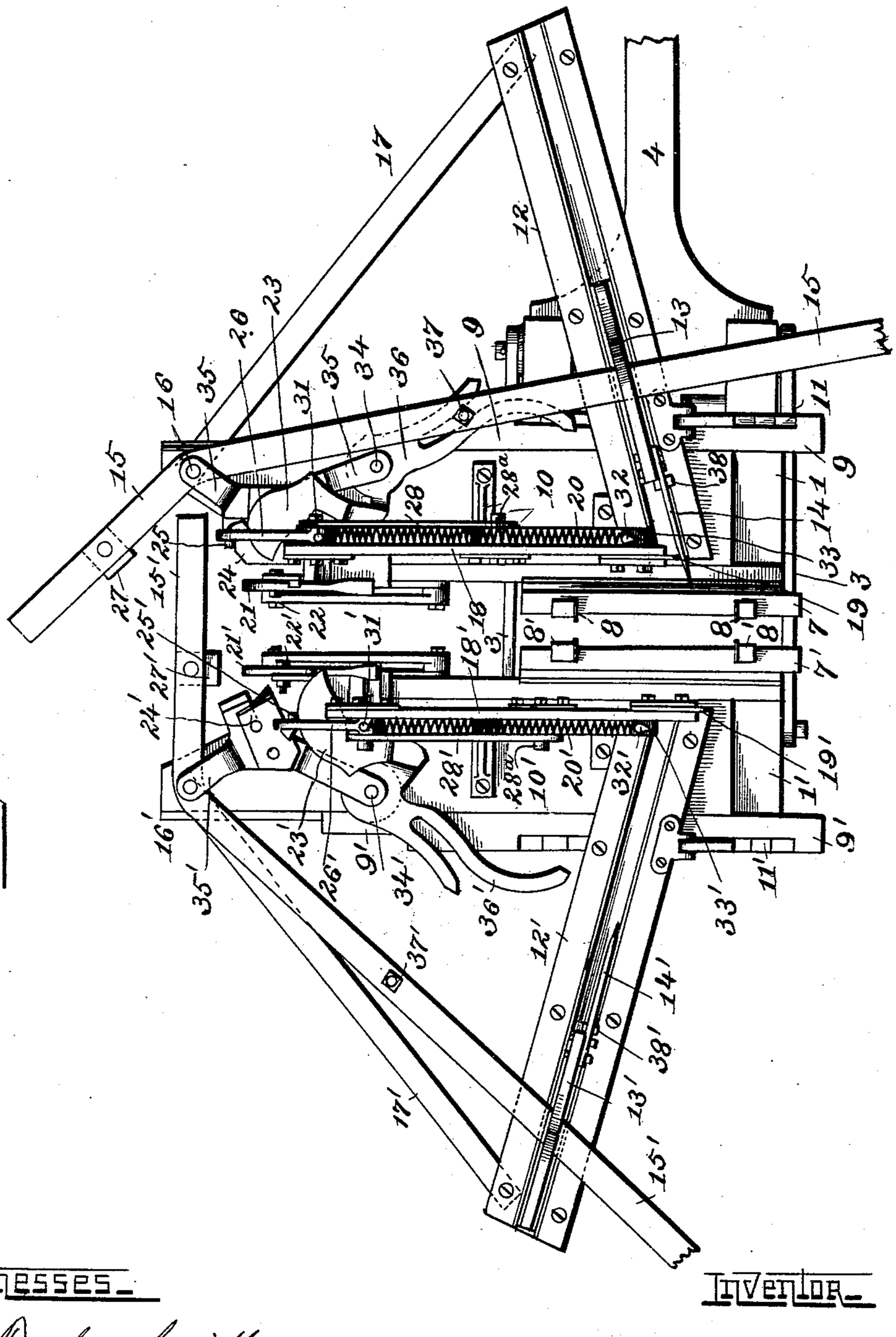

Fig. 1.

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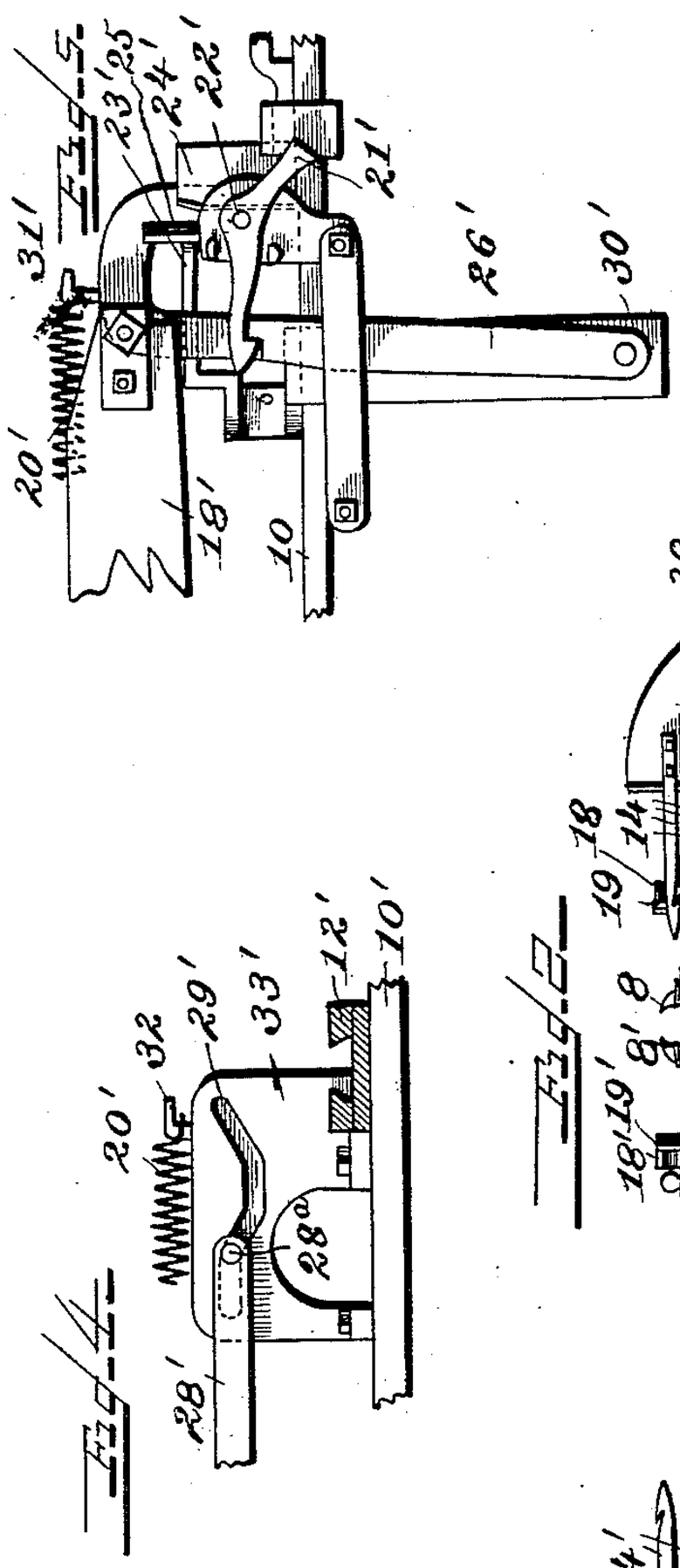
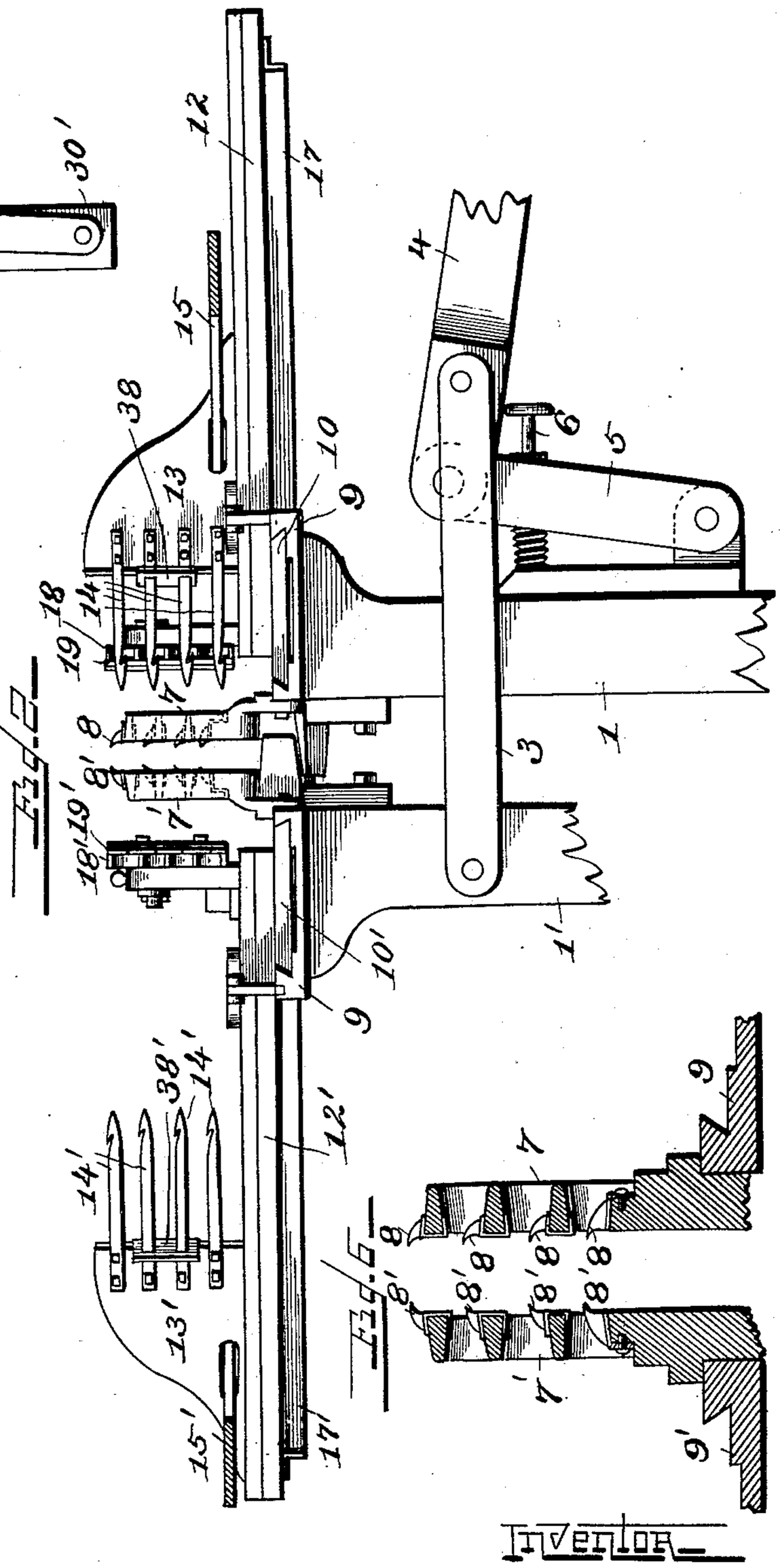
(No Model.) 3 Sheets—Sheet 2.





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(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

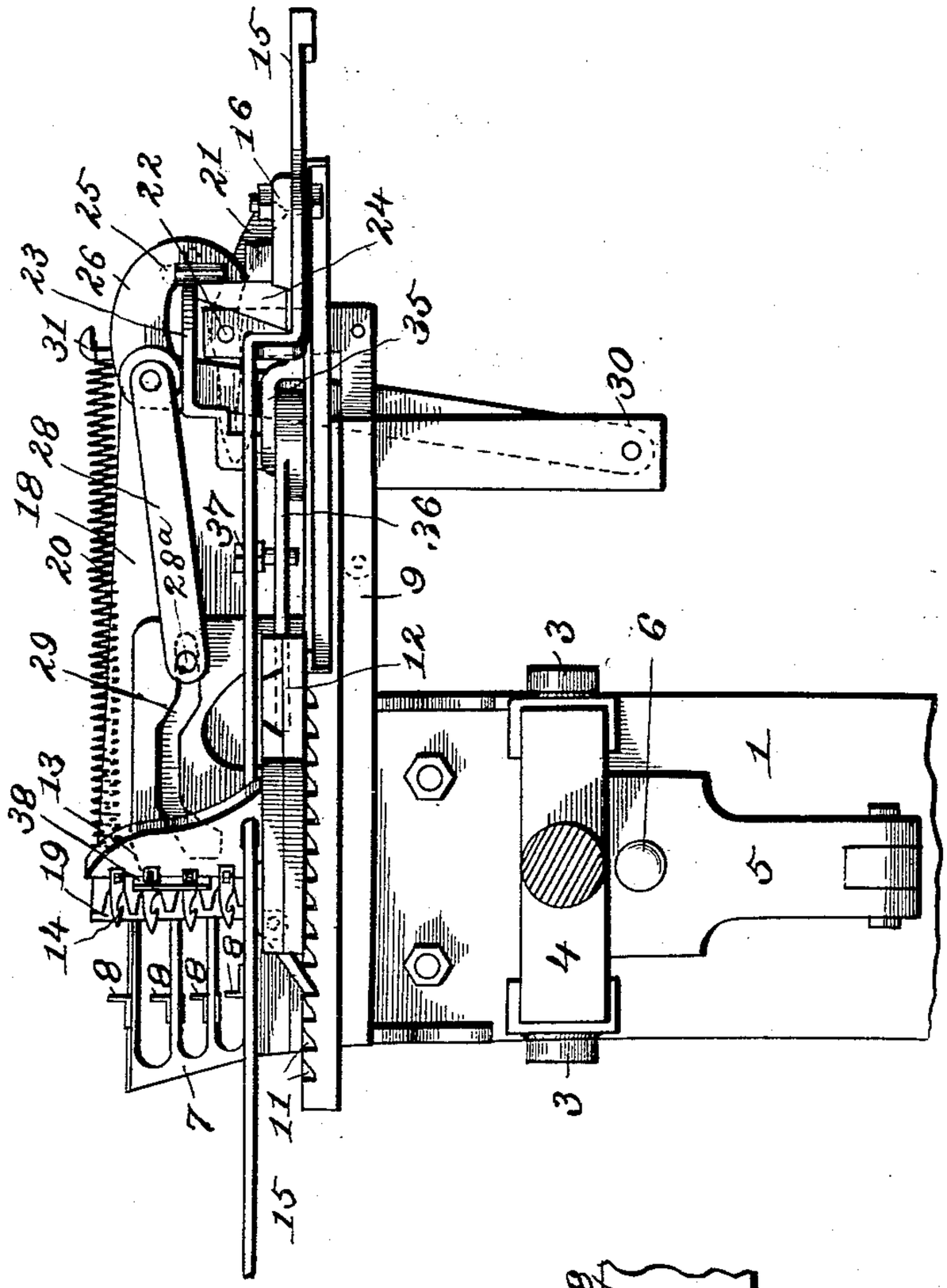
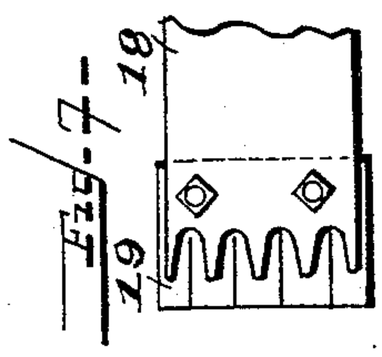


Fig. 7.



Witnesses

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BROOM-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 677,591, dated July 2, 1901.

Application filed July 9, 1898. Serial No. 685,545. (No model.)

To all whom it may concern:

Be it known that I, HARVEY S. PAGE, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Broom-Sewing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

It is the object of my invention to provide a device capable of being easily operated by hand for sewing a plurality of threads through a broom. My device sews the required number of threads at one operation and is manipulated by hand. It possesses features of novelty hereinafter fully pointed out and claimed. I accomplish this object by means of the machine illustrated in the accompanying drawings, in which—

Figure 1 shows a top view of the device. Fig. 2 shows a front elevation of the jaws for clamping the broom and the needles and their carriages. Fig. 3 is a side elevation looking from the right of Fig. 1. Fig. 4 is a detail side view of one of the cam devices which guide the threader. Fig. 5 is a detail side view of the threader-retaining mechanism. Fig. 6 is a vertical section taken through the broom-holding jaws. Fig. 7 is a detail view of the elastic grip which holds the threads in place.

I have distinguished the parts on the left side of the device from those on the right by numerals bearing prime-marks.

1 and 1′ are standards on which the entire machine is supported. The standard 1 is fixed and the other, 1′, is mounted on a pivot at the bottom, so as to be capable of being swung to and from the standard 1 by means of links 3, operated by toggle-links 4 and 5, the link 4 constituting a hand-lever. The extent of the movement is limited by a set-screw 6. Securely bolted or otherwise secured to the standards 1 and 1′ are jaws 7 and 7′, between which the broom-straw, tied into a bundle and to be sewed, is securely clamped, the jaws being held by the toggle-links 4 and 5. These jaws are furnished with slots through which the needles of the machine may pass, said slots being of greater length than the width of the broom to be sewed. Secured to the jaws and occupying the slots therein are prongs 8 and 8′, that serve to support the twine with which the broom is sewed.

On the standards 1 and 1′ are fixed guides 9 and 9′, that extend from front to rear of the machine and are dovetailed to receive slides 10 and 10′, that operate thereon. At the outer edge of the guides 9 and 9′ are racks 11 and 11′, the teeth of which are of approximately the same length as the length of the stitches to be made in sewing the broom, as will be hereinafter explained. Fixed to the slides 10 and 10′ are channeled bars 12 and 12′. These channeled bars are set at slight inclines to the slides, as seen in Fig. 1, so that the needle-carriers which operate therein may be carried inwardly at an incline with relation to the broom in order that the needles may be forced through the broom at angles to the sides thereof, thereby providing for the production of stitches running at angles across the broom instead of transversely.

13 and 13′ are slides loosely seated in the channels of the bars 12 and 12′, adapted to be moved inwardly and outwardly in said channel-bars to and from the broom-holding jaws. These slides carry needles 14 and 14′, the needles being of the kind usually used in broom-sewing machines. The number of needles corresponds to the number of rows of stitches to be made in the broom, and the needles are arranged one above the other, occupying positions that enable their passage through the slots in the jaws 7 and 7′. By referring to Fig. 2 it will be observed that the eyes of the needles on the slide 13 open downwardly, while those carried by the slide 13′ open upwardly.

15 and 15′ are hand-levers pivoted at 16 and 16′ to the slides 10 and 10′. These levers pass loosely through openings in the needle-carrying slides 13 and 13′, and when the levers are moved they serve to move the slides 13 and 13′ inwardly and outwardly in the channels of the bars 12 and 12′. The outer ends of the channeled bars 12 and 12′ are connected to the rear ends of the slides 10 and 10′ by braces 17 and 17′.

18 and 18′ designate slide-bars, which I will hereinafter call "threaders." These thread-

ers are movably mounted above the slides 10 and 10′, their length extending parallel of the length of the said slides and they being adapted to operate backward and forwardly to and from the path of the needles in the passage of said needles to the broom-holding jaws.

19 and 19′ are strips of rubber secured to the forward ends of the threaders, the said strips being provided with a series of slits corresponding to the number of needles and likewise to the number of rows of stitches to be produced in sewing the broom. These strips 19 and 19′ serve as a tension device for the sewing-twine, the twine passing through the slits therein, where it is held in position to be caught by the needles.

The threaders 18 and 18′ are arranged to be projected forwardly by springs 20 and 20′ in the manner to be hereinafter particularly pointed out.

21 and 21′ are dogs pivoted at 22 and 22′ to brackets carried by the slides 10 and 10′.

23 and 23′ are cam members pivoted to the slides at 34 and 34′.

24 and 24′ are upright flat-spring posts fixed to the slides 10 and 10′ near the rear ends thereof.

26 and 26′ designate what I term "drivers," provided with studs 25 and 25′ at their sides, adapted to engage the rear edges of the flat springs 24 and 24′. These drivers are pivoted to hangers 30 30′ (see Figs. 3 and 5) and are capable of rocking on said pivot. The drivers are pivoted to the threaders 18 and 18′, and their upper ends extend rearwardly in a curve upon which the lugs 25 and 25′ are carried. The pivots connecting the threaders and drivers join them, so that they are required to move in unison.

28 and 28′ designate links one end of each of which is connected to the pivot that joins the threaders and drivers. The opposite end of each link carries a pin 28^a, engaged in the threaders 18 and 18′.

29 and 29′ are cam-grooves in standards 33 and 33′, mounted on the slides 10 and 10′, in which grooves the pins carried by the links 28 and 28′ are adapted to ride, the said pins being fixed to the threaders 18 and 18′. By arranging the said pins to ride in the said cam-grooves the threaders are caused to partake of a rise-and-fall motion in their movement that allows for the sewing-twine carried thereby being carried either above or below the eyes of the needles 14 and 14′, as required in order to have the needles catch the twine. On the drivers 26 and 26′ are hooks 31 and 31′, to which the rear ends of the springs 20 and 20′ are secured, the forward ends of said springs being connected to hooks 32 and 32′ on the cam-groove containing standards 33 and 33′.

27 and 27′ are tripping-blocks carried by the hand-levers 15 and 15′, said blocks being arranged on the levers in such positions that when the forward ends of the levers are moved outwardly the blocks will be carried against the dogs 21 and 21′ and coming in contact with said dogs trip them.

36 and 36′ designate slotted arms projecting from the cam members 23 and 23′. The slots in these arms are adapted to receive pins 37 and 37′ on the hand-levers 15 and 15′, whereby the cam members may be swung on their pivots in engagement with the drivers 26 and 26′.

On the needles I have provided removable stop-plates 38 and 38′, adapted to limit the movement of the needles, the said plates being adapted to strike against the jaws 7 and 7′ as the needles are carried inwardly.

In the operation of this machine it is required that the two sets of needles be alternately carried through the broom-straw and threaded and drawn back, bringing the sewing-twine through the straw each time. It is further required that each stitch be of a determined length and that the needles be fed through the entire thickness of the broom to receive the twine. To arrive at the results above stated, I hold the broom-straw in a fixed position between the jaws 7 and 7′ and move the sewing devices. I take a bundle of straw and tie it loosely into approximately the shape of the broom to be made and clamp it firmly between the jaws by the toggle 4 5. I then take a number of pieces of sewing-twine corresponding to the number required to bind the broom, cut to the required length, and passing each of them around the bundle of straw through the elongated slots in the jaws 7 and 7′ secure one end of each piece of twine to a part of the straw, leaving a loose end of sufficient length to be sewed throughout the entire width of the broom. The straw is at this time in condition for the sewing operation. In sewing I first pass the needles 14′ on the left-hand side of the machine through the bundle of straw by drawing the hand-lever 15′ inwardly, so that the eyes of said needles project beyond and through the straw. I then place the loose end of each piece of twine in the eyes of the needles 14′ by hand and push the said lever outwardly, carrying the needles, with the twine in the eyes thereof, through the straw to their first position. When this has been done, the parts of the machine are in the position shown in Figs. 1 and 2, and the twine carried through the broom-straw has been drawn, with the needles, into the slits in the rubber strips 19′. The hand-lever 15 is then drawn inwardly, and the needles 14 are carried through the straw, when their eyes receive the sewing-twine by catching the said twine where it is upheld by the slitted strip 19′ At this time the threader 18 at the right-hand side of the machine is in rear position. The hand-lever 15 is then moved outwardly, and the needles 14 are drawn through the straw, carrying the twine therewith. Immediately upon the needles reaching the right-hand side of the broom the threader 18 is released in the manner

herein described and at a time that will cause the said threader to strike the needles. The consequent result is that the rubber strip 19 is forced onto the needles at the locations of the slits in said strips and the needles enter said slits and carry the twine therewith. The movement of the needles being continued, they pass out of the strips; but the twine remains therein ready to be caught by the needles 14′ as they are subsequently brought through the broom in the sewing operation. When the lever 15 is moved inwardly, the pin 37, carried thereby, operates in the slotted arm 36 and causes this arm and the cam member 23 to be moved, so that the cam member is thrown rearwardly in contact with the rear end of the driver 26, carrying the driver rearwardly, and with it the threader 18, against the action of the spring 20. The driver is carried rearwardly until the stud 25 thereon engages the rear edges of the upright spring-post 24, where the driver is maintained for the time being. On the reverse movement of the hand-lever 15, which draws the twine through the broom-straw, the pin 37 operates in the slot of the arm 36, causing the cam member 23 to be moved forwardly against the spring-post 24, throwing the post to one side and carrying the stud 25 from the spring-post, so that the driver is released and may be drawn forward by the spring 20 and carry the threader 18 correspondingly, so that the twine carried thereby in the slits of the strip 19 is again brought to the position to be caught by the needles 14′, when they are carried through the straw in the same manner as that first described. As the needles 14′ are carried through the straw the threader 18′ is carried backward by reason of the driver 26′ being engaged by the cam member 23′, operated in like manner to that described in connection with the corresponding parts at the opposite side of the machine. These operations are carried on in the manner stated through the entire sewing of the broom, each set of needles being alternately carried inward and outward to draw the sewing-twine backward and forward through the straw. Each time the threader 18 or 18′ at either side of the machine is permitted to move forward by the driver being disengaged from the spring-post 24 or 24′ the driver moves forwardly under the impelling power of the spring 20 until it is caught by the dog 21 or 21′, and the parts are retained in this position until the hand-lever being moved is thrown outwardly to a position where the tripper-block 27 or 27′ is brought against the dog 21 or 21′ and releases said dog from engagement with the driver, permitting the threader to be projected forwardly under the action of the spring 20 or 20′. As the threader moves forwardly the pin 28^a, connecting the threader and the links 28 and 28′, rides in the cam-grooves 29 and 29′, carrying the twine under or over the needles, according to the side of the machine at the time being operated.

The two sides of the machine are identical except in that the cam-grooves 29 and 29′ are reversed from each other, so that the threader at the right-hand side of the machine may ride upwardly in its forward movement, and the threader at the left-hand side may ride downwardly in order to allow the needles on the right-hand side to receive the twine in their eyes, which open downwardly, while the needles at the opposite side of the machine have their eyes open upwardly.

Each time that the hand-levers 15 and 15′ are moved outwardly to their fullest extent the rear ends of the levers are brought against the inner parts of the braces 35 35′, which serve as stops. The continued pressure against the hand-levers causes the slides 10 and 10′ and the parts carried thereby to be moved rearwardly, the movement effected each time being the extent of one of the notches of the teeth 11 11′, so that the needle-carriers are moved rearwardly a corresponding distance to present the needles to the broom at the location of the next stitch to be produced in the broom.

I claim as my invention—

1. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides located at each side of said jaws, channel-bars carried by said slides, needle-carriers arranged to operate in said bars, and needles fixed to said carriers, substantially as described.

2. In a broom-sewing machine, the combination of means for holding the broom, a series of needles for stitching said broom, and a threader comprising bars and slitted rubber strips carried by said bars adapted to receive and hold the sewing-twine under tension, substantially as described.

3. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides, needle-carriers and the needles fixed thereto, means for operating said needle-carriers, reciprocating threaders arranged to receive the sewing-twine, means for retracting said threaders, and springs whereby the threaders are projected forwardly, substantially as described.

4. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides, needle-carriers and the needles fixed thereto, means for operating said needle-carriers, reciprocating threaders arranged to receive the sewing-twine, drivers having connection with said threaders, means for retracting said drivers, and springs arranged to project said drivers forwardly, substantially as described.

5. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides, needle-carriers and the needles fixed thereto, means for operating said needle-carriers, reciprocating threaders, drivers having connection with said threaders, means for retracting said drivers, dogs arranged to hold said drivers in retracted posi-

tions, springs arranged to project the drivers forwardly, and means for tripping said dogs, substantially as described.

6. In a broom-sewing machine, the combination of a frame, broom-holding jaws, needle-carriers and the needles fixed thereto, reciprocating threaders, means for operating said threaders and slitted strips carried by said threaders adapted to receive the sewing-twine and deliver it to said needles, substantially as described.

7. In a broom-sewing machine, the combination of a frame, broom-holding jaws, needle-carriers and the needles fixed thereto, reciprocating threaders, means for operating said threaders, reciprocating slides on which said parts are mounted, standards on said slides provided with cam-grooves, and pins carried by said threaders arranged to operate in said grooves to cause said threaders to rise and fall in their forward movement, substantially as described.

8. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides mounted on said frame, racks on said frame, pawls carried by said slides arranged to engage said racks, needle-carriers and the needles fixed thereto, and means for operating said needle-carriers, substantially as described.

9. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides mounted on said frame, needle-carriers and the needles fixed thereto, reciprocating threaders, drivers connected to said threaders, hand-levers for operating said needle-carriers, springs adapted to move said threaders forwardly, and means for retracting said drivers, comprising cam members having arms arranged to be engaged by said hand-levers, substantially as described.

10. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides, needle-carriers and the needles fixed thereto, hand-levers by which said needle-carriers are actuated, reciprocating threaders, drivers connected to said threaders, springs arranged to project said drivers and threaders forwardly, cam members arranged to engage said drivers, said cam members being provided with slotted arms adapted to be engaged by said hand-levers for the purpose of moving the arms and retracting said drivers, substantially as described.

11. In a broom-sewing machine, the combination of a frame, broom-holding jaws, reciprocating slides, needle-carriers and the needles fixed thereto, hand-levers by which said needle-carriers are actuated, reciprocating needle-threaders, drivers connected to said threaders, springs arranged to project said drivers and threaders forwardly, spring-posts fixed to said slides adapted to engage said drivers when retracted, cam members pivoted to said slides adapted to retract said drivers and also to press said spring-posts sidewise for the purpose of releasing said drivers, said cam members being arranged to be engaged by said hand-levers whereby they are actuated, substantially as described.

HARVEY S. PAGE.

In presence of—
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