

No. 788,212.

PATENTED APR. 25, 1905.

R. L. LYONS.

THREAD CUTTER FOR SEWING MACHINES.

APPLICATION FILED MAY 5, 1902.

3 SHEETS—SHEET 1.

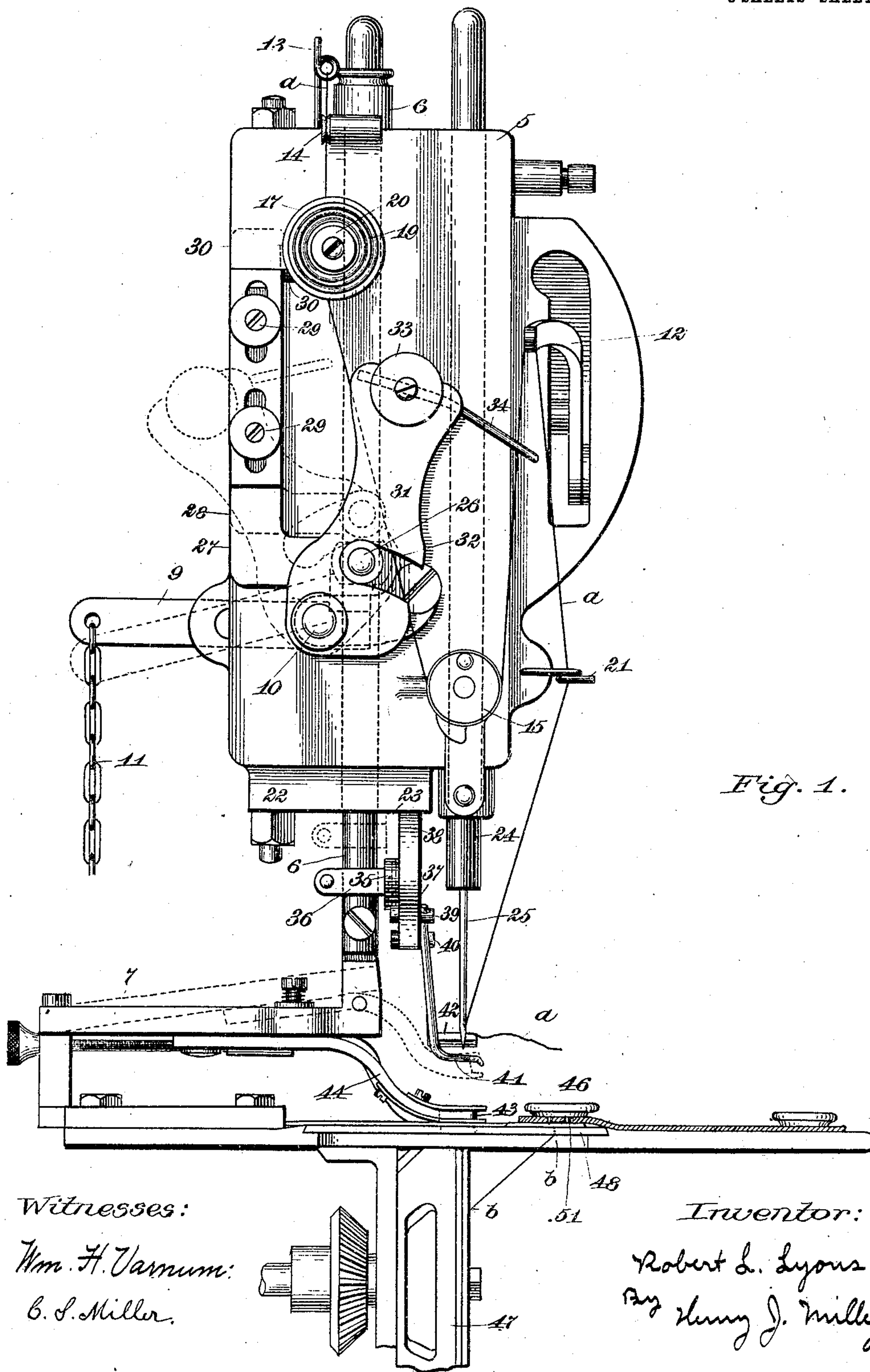


Fig. 1.

Witnesses:

Wm. H. Varnum:

B. S. Miller.

Inventor:

Robert L. Lyons
By Henry J. Miller
att'y.

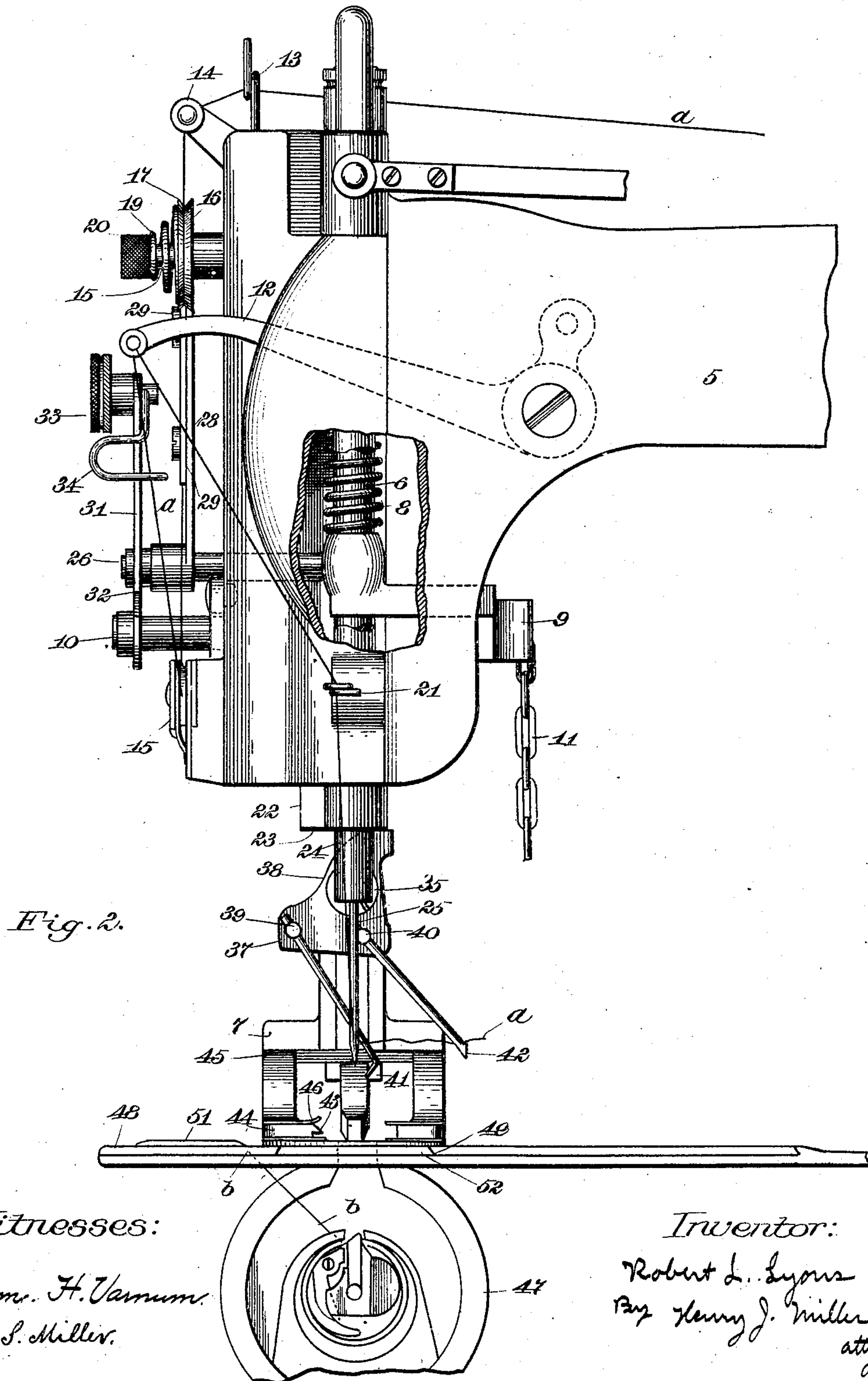
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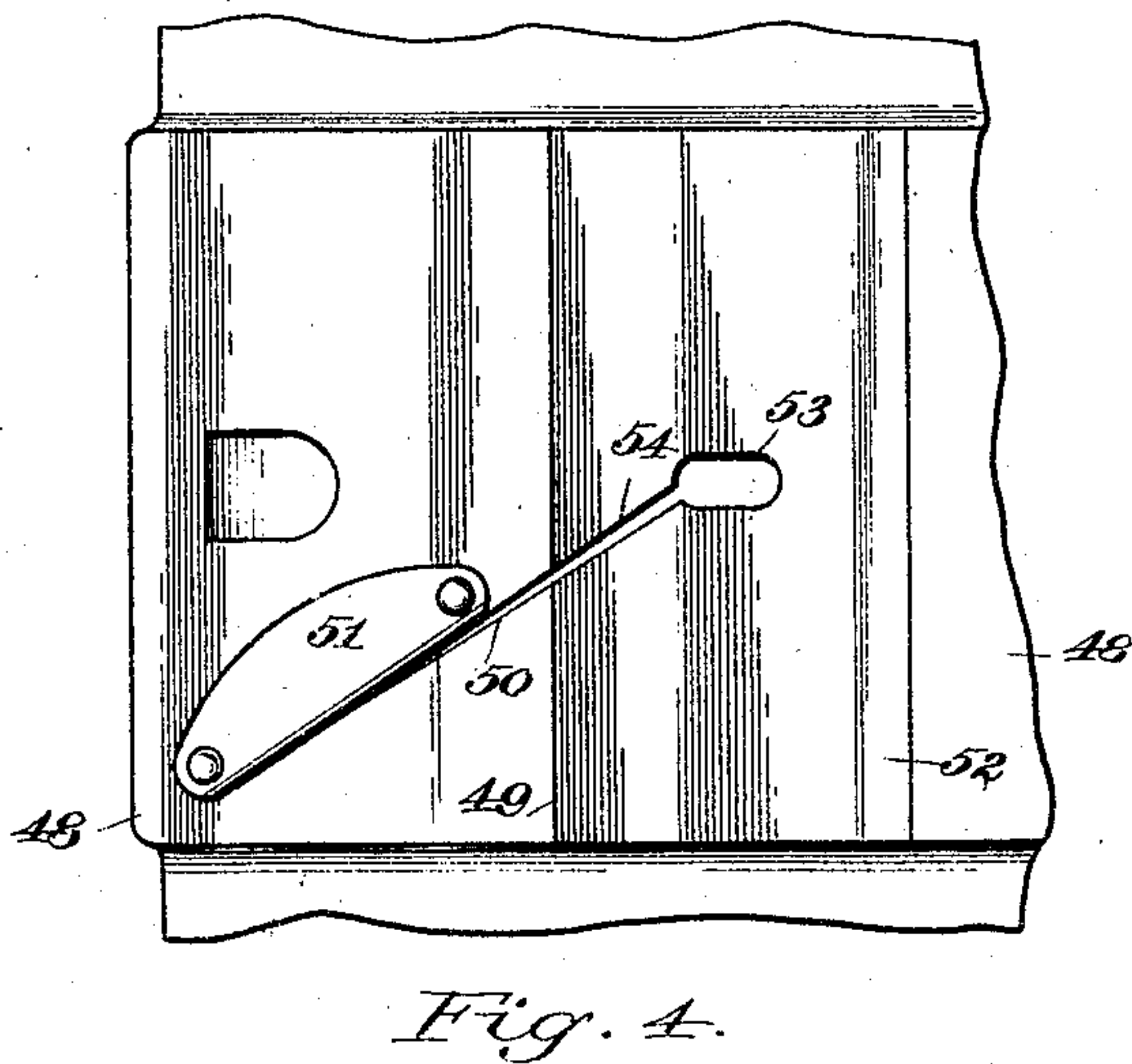
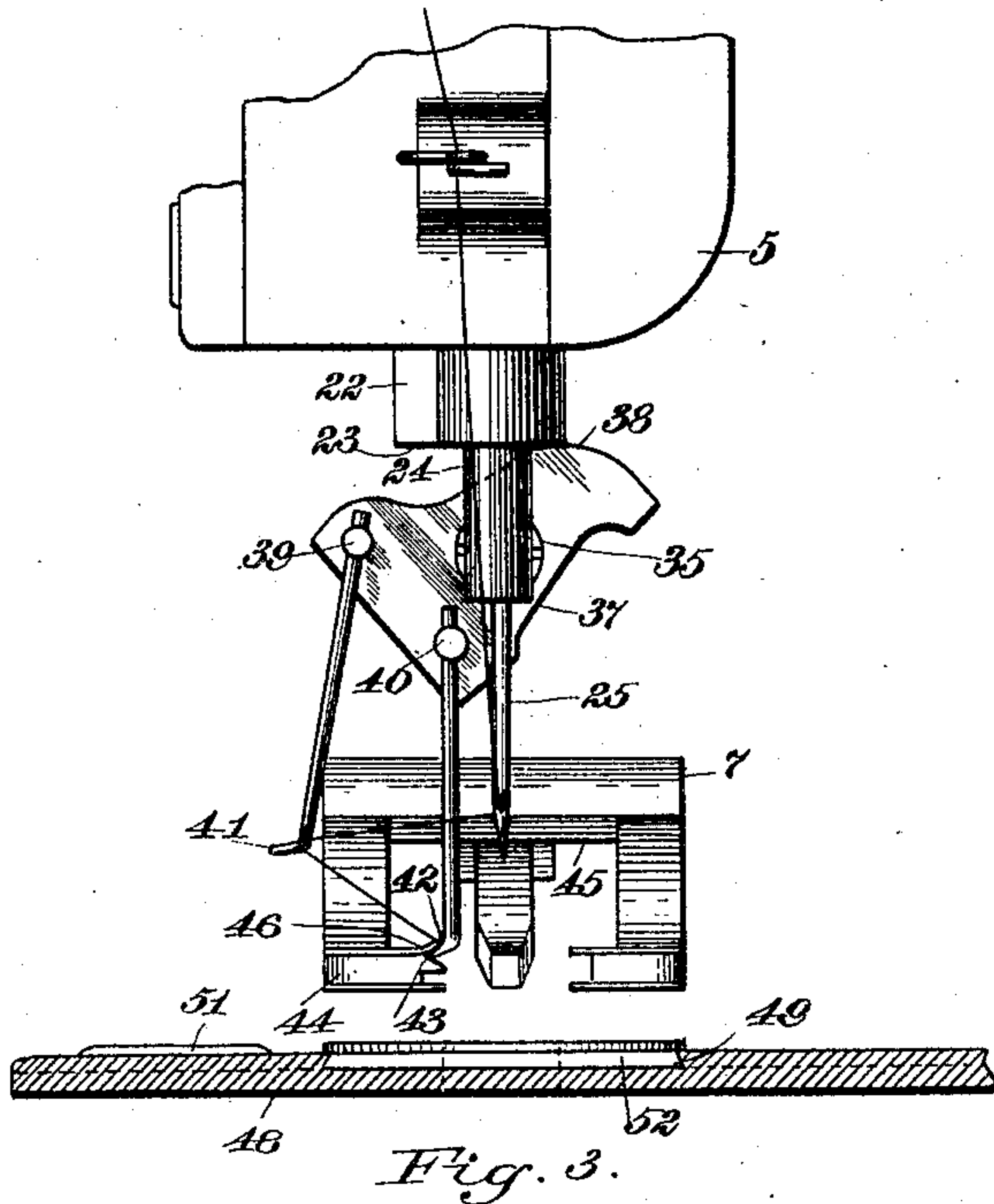
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3 SHEETS—SHEET 3.



Witnesses:

Wm. H. Vanum.

C. S. Miller.

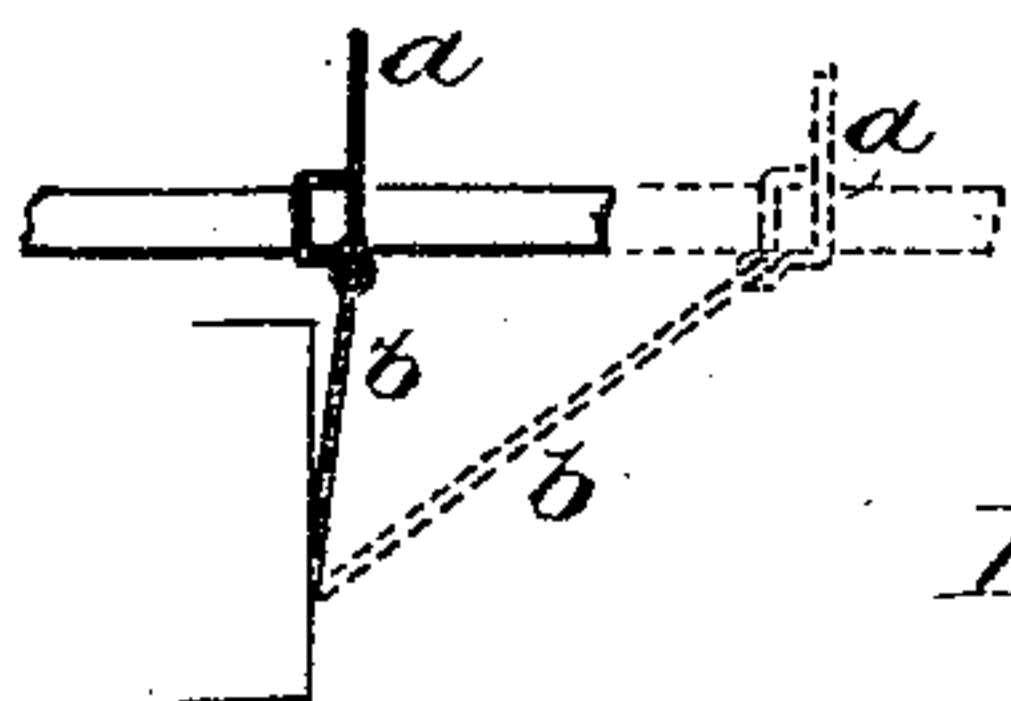


Fig. 5.

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UNITED STATES PATENT OFFICE.

ROBERT L. LYONS, OF WALTHAM, MASSACHUSETTS.

THREAD-CUTTER FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 788,212, dated April 25, 1905.

Application filed May 5, 1902. Serial No. 105,913.

To all whom it may concern:

Be it known that I, ROBERT L. LYONS, a citizen of the United States, residing at Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Thread-Cutters for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in sewing-machines, and particularly to improvements in thread-trimming devices therefor.

The object of the invention is to automatically trim the shuttle-threads before the work 15 has been entirely drawn from the machine.

Another object of the invention is to draw out the shuttle-thread and secure the cut end thereof at a distance from the path of the needle.

20 Other objects of the invention will be apparent from the description and claims.

The invention thus also consists in a work-support having provision whereby the shuttle-thread may be drawn away from the path 25 of the needle without drawing said thread through the needle-hole and means for engaging and securing the shuttle-thread at or about the time the same is severed.

30 So, also, the invention consists in such other novel features of construction of parts as shall hereinafter be more fully described, and pointed out in the claims.

In the drawings, as illustrating the improved shuttle-thread cutter and holder in relation to other parts of a sewing-machine, Figure 1 represents an end view of portions of a sewing-machine, illustrating this invention, the work being partially drawn out. Fig. 2 represents a front view of portions of the same in the position for starting, but before the work is introduced. Fig. 3 represents a front view of portions of the improved machine, partially in section, showing the presser-foot in the elevated position and the 45 positioner and cutter members for the needle-thread in place as immediately after the drawing out of the work. Fig. 4 represents a plan view of portions of the machine-table and work-support, showing the throat-plate 50 slotted diagonally from the needle-hole and

the slotted portion of the work-support with its shuttle-thread cutter and clamp. Fig. 5 is a detail view to illustrate the manner in which the cut end of the needle-thread is drawn down into the work by the shuttle-thread under the movement of the work to the point at which the shuttle-thread is engaged and cut.

Similar numbers of reference designate corresponding parts throughout. 60

In illustrating this invention I have shown the construction and arrangement of the parts adapted for the carrying out of the objects sought to be accomplished, these new parts being shown in relation to the old and well-known parts of the machine with which they coöperate. It is herein understood that the parts which are omitted from the drawings are, or should be, of any well-known construction. 70

As shown in the drawings, the head 5 is of any usual construction and is furnished with the ordinary presser-bar 6, vertically movable and pivotally connected with any usual (except as hereinafter stated) presser-foot 7, 75 this presser-bar 6 being depressed by the usual spring 8 and being moved against the action of said spring by means of the lever 9, pivoted in the head, the shaft 10 of which is fixed to said lever and is journaled in bearings of the head, the inner end of this lever being engaged or connected with the presser-bar and the outer end of the lever being connected with any suitable means for depressing this end and elevating the inner end thereof, 85 this means preferably consisting of the ordinary treadle, with which the lever 9 is connected by means of the chain 11.

The head 5 is provided with the usual take-up lever 12, mounted and actuated in the ordinary manner. It has also the guides 13, 14, and 15, over which the needle-thread is directed, and is furnished with the tension-disks 16 and 17, mounted on the post 18 and pressed together by the spring 19 bearing against the nut 20 on said post and the surface of the disk 17. At the front or side of the head 5 is the guide 21. At the lower portion of the head is a member 22, preferably in fixed relation to the head and having the under bear- 100

ing-surface 23, the extension of which will be seen in Fig. 1 of the drawings. Adjacent to the front end of this member 22 is the needle-bar 24, mounted for vertical reciprocation 5 under the operation of the usual driving mechanism. This bar is shown as provided with a needle 25.

From the presser-bar 6 extends the stud 26, which works through an opening in the 10 head 5, and on the outer portion of this stud is fixed the plate 27, having the upwardly-extending member 28, carrying the screw-clamps 29 29, on which the slotted portion of the tension-release wedge 30 is adjustably mounted, 15 this wedge 30 being positioned to enter between the disks 16 and 17 and cause their separation as the presser-bar is elevated.

On the stud-shaft 10, fixed on the head, is pivoted the thread-puller plate 31, having the 20 cam-slot 32, working over the stud 26, which stud acts to swing the plate 31 as it, said stud, moves upward and as a stop against the end of said slot in the forward movement of the plate. At the upper end of this plate 31 25 is the adjustable screw-clamp 33, carrying the thread-puller 34, this puller being designed to be adjusted to work in relation to the action of the tension-release.

At the lower portion of the presser-bar is 30 secured the bearing 35, preferably by means of the clamp 36, and on this bearing is rotatable the cam-plate 37, having the cam edge 38. In perforations of this plate are adjustably secured the studs 39 and 40. In or on 35 the stud 39 is adjustably mounted the shank of the needle-thread positioner 41, and in or on the stud 40 is adjustably mounted the shank of the needle-thread cutter member 42.

The needle-thread cutter member is herein 40 shown in relation with a cooperating cutter member 43, forming part of the arm 44 of the usual button-clamp 45, said arm being provided with the spring-plate 46; but where no button-clamp is used or desired this member 45 43 and the spring-plate 46 may be supplied to any suitable supporting portion of any presser-foot.

The needle-thread *a a* is strung through the guide 13 over the guide 14, between the disks 50 16 and 17, to and under the guide 15, then through the perforation in the lifter-arm 12, through the guide 21, and through the eye of the needle 25.

The shuttle 47 is of the usual construction 55 and operation, having any ordinary form of tension device or other well-known means for exerting more or less resistance to the running out of the shuttle-thread *b b* therefrom.

The work-support preferably comprises a 60 plate 48, having an opening 49 from the front rearwardly approximately above the position of the shuttle, and a slot 50, extending diagonally from said opening and having converging sides. At one edge of said slot is secured 65 a thin cutting-blade 51, the cutting edge of

which approximately follows the edge of the slot 50 or may overlap the same. In the opening 49 is removably contained the throat-plate 52, furnished with the needle hole or passage 53 and with the slot 54 having converging 70 sides, which slot when the throat-plate is in position registers with the slot 50 in the portion 48. It is, however, evident that the portions 48 and 52 are made in separate parts 75 merely as a matter of convenience and that the slot from the needle-hole to the cutter may be formed in one piece of material without changing the invention.

At the completion of the sewing the needle is in the position shown in Fig. 2 of the draw- 80 ings. The needle-thread, however, extends in practically a straight line from the eye of the needle down through the work where the shuttle-thread extends through the last loop of the needle-thread and lies somewhat in the 85 approximately vertical position between said loop and the shuttle. In making the last of a group of stitches in this class of machine and on the last upward stroke of the needle the needle-thread is drawn tight and draws 90 the bight of the shuttle-thread to the forward portion of the group of stitches—that is, to the right-hand side as looking at Fig. 1 of the drawings and as the threads are shown in full in Fig. 5 of the drawings. In remov- 95 ing the work from the machine it is necessary to raise the presser-foot, and this is generally accomplished by depressing the outer end of the lever 9. At the depression of the 100 outer end of the lever 9 the presser-bar 6 is raised, the initial result being to start the lifting of the presser-foot and button-clamp and to force the wedge 30 between the disks 16 and 17 of the needle-thread tension, thus re- 105 leasing the thread or reducing the frictional contact of the disks thereon. Practically simultaneously with such movement the thread- 110 puller plate 31 is swung backward and the thread-puller 34 engages the thread *a a* and draws it from the direction of the guide 13, 115 but has no effect on the thread between the needle and the work. Continuing, the lifting of the presser-bar results in the lifting of the presser-foot to the point shown in Fig. 3, and during this lifting the cam edge 38 of the 120 cam 37 is forced against the surface 23, thus from the shape of the cam edge causing the cam to rock on its bearing to swing the thread- 125 positioner 41 and the cutter member 42 in succession across the path of the needle and below the point thereof. As the thread- 130 positioner 41 swings between the needle and the work it engages this portion of the thread and carries it against the edges of the cutter member 43 and the spring 46, thus positioning the 135 thread for the subsequent nipping of the thread between the cutter members 42 and 43 and between the upper inclined surface of the cutter member 42 and the curved portion of the 140 spring 46, as shown in Fig. 3 of the drawings.

Attention is at this point called to the small amount of thread which is drawn through the needle-eye by the above-described movement of the needle-thread positioner, an amount approximating the distance from the needle-eye to the work, and to the fact that this drawing is permitted by the previous loosening of the thread beyond the needle by the thread-puller 34 and its coöperating mechanism. Attention is also called to this length of thread to demonstrate that the device 41 is not a "thread-puller" in the ordinary meaning of such term, as it does not draw the thread sufficiently for the restarting of the machine, this being accomplished by the thread-puller 34. With the various parts in the positions thus described the work is either drawn along the work-support to bring another portion below the needle or is drawn entirely from the machine. In drawing the work forward it is also moved diagonally in the direction of the slot 54. The first trimming action is of course on the needle-thread, which is cut between the co-operating cutting portions of the cutter members 42 and 43, the cut end being retained between the cutter member 42 and the spring 46, as is shown in Fig. 3 of the drawings, and leaving a cut end *a*, Fig. 5, above the work. The moving of the work being continued, the shuttle-thread is carried along through the slot 54 and enters the slot 50, this drawing of the shuttle-thread being in a degree restrained by the shuttle tension. The angle of inclination between the shuttle-thread and the lower surface of the work changes from the first practically vertical direction to approximately the angle shown in Fig. 2 of the drawings. At the same time the resistance of the shuttle tension exerts a drag on this thread where it passes through the last loop of the needle-thread to draw said loop backward, and thus draw the cut end of the needle-thread into the work. To obviate any possible undue yielding of the shuttle-thread which might render the action thereof ineffectual for the pulling down of the cut end of the needle-thread, the shuttle-thread as it moves along the more con-

tracted portion of the slot 50 is gripped between the converging walls thereof slightly before that portion of the thread immediately below the work is brought into severing contact with the edge of the cutter 51, and this positive engagement of the shuttle-thread effects a positive resistance thereon to draw down the cut end of the needle-thread. The gripping of the shuttle-thread between the converging walls of the slot 50 also holds the cut end of this thread drawn out for the restarting of the machine.

I do not limit myself to the particular constructions herein shown and described, for it is understood that the parts and their combinations may be considerably varied without departing from the spirit of this invention.

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

1. In a sewing-machine, a work-support furnished with a slot, extending from the needle-hole, the converging edges of which slot form a shuttle-thread-gripping device.

2. In a sewing-machine, a work-support comprising a throat-plate having a needle-hole and a slot extending therefrom, and a plate in which the throat-plate is movably secured and having a slot with which the slot of the throat-plate is designed to register, and a thread-cutting device positioned in line with said slot.

3. In a sewing-machine, a work-supporting plate, having a slot, the converging edges of which form a thread-gripping device, a cutter adapted to act on thread extending through said slot, and a throat-plate removably secured to said supporting-plate and having a needle-hole and a slot extending from said hole and adapted to register with the slot in said supporting-plate.

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

ROBERT L. LYONS.

Witnesses:

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ARTHUR E. DENISON.