

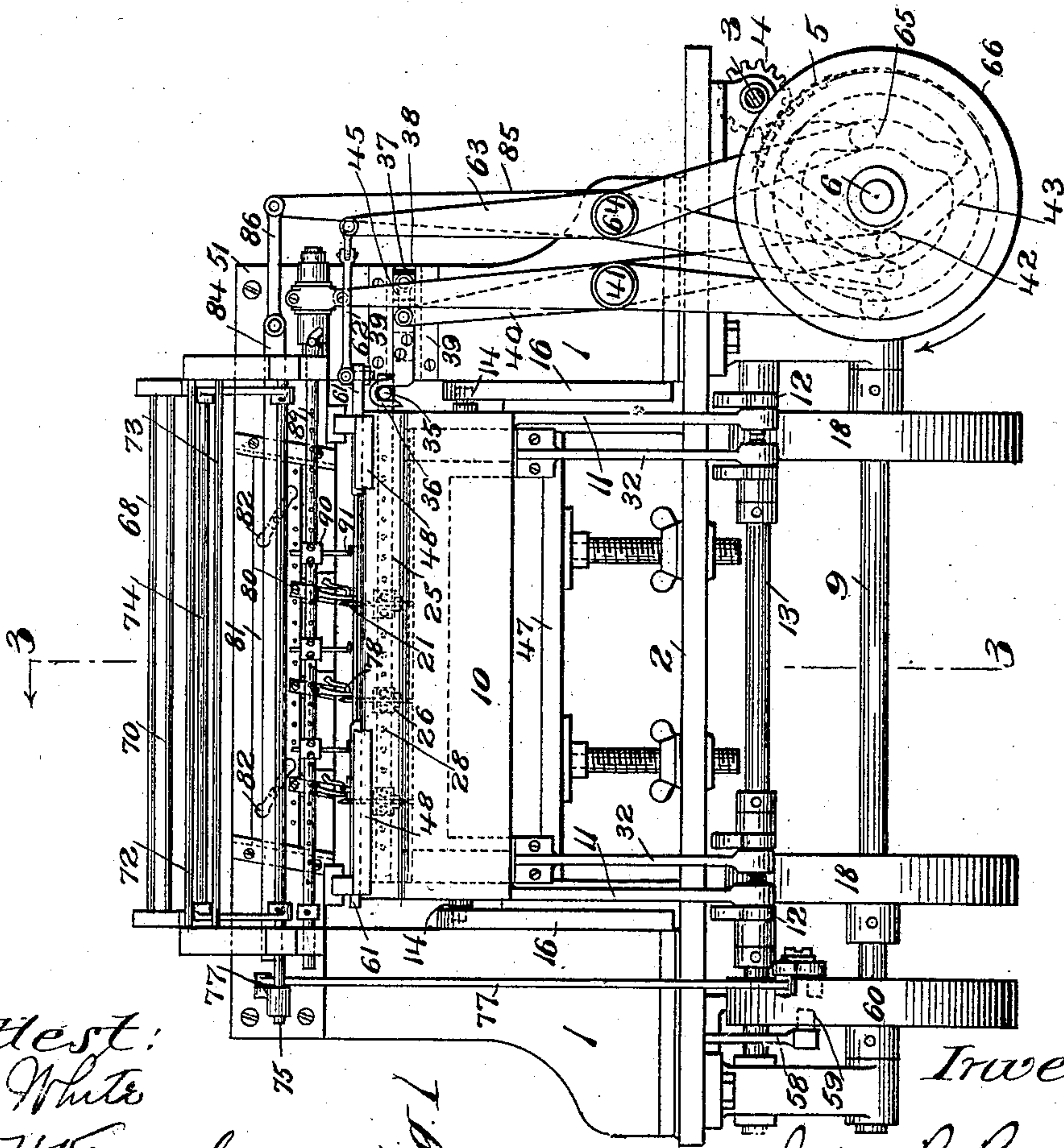
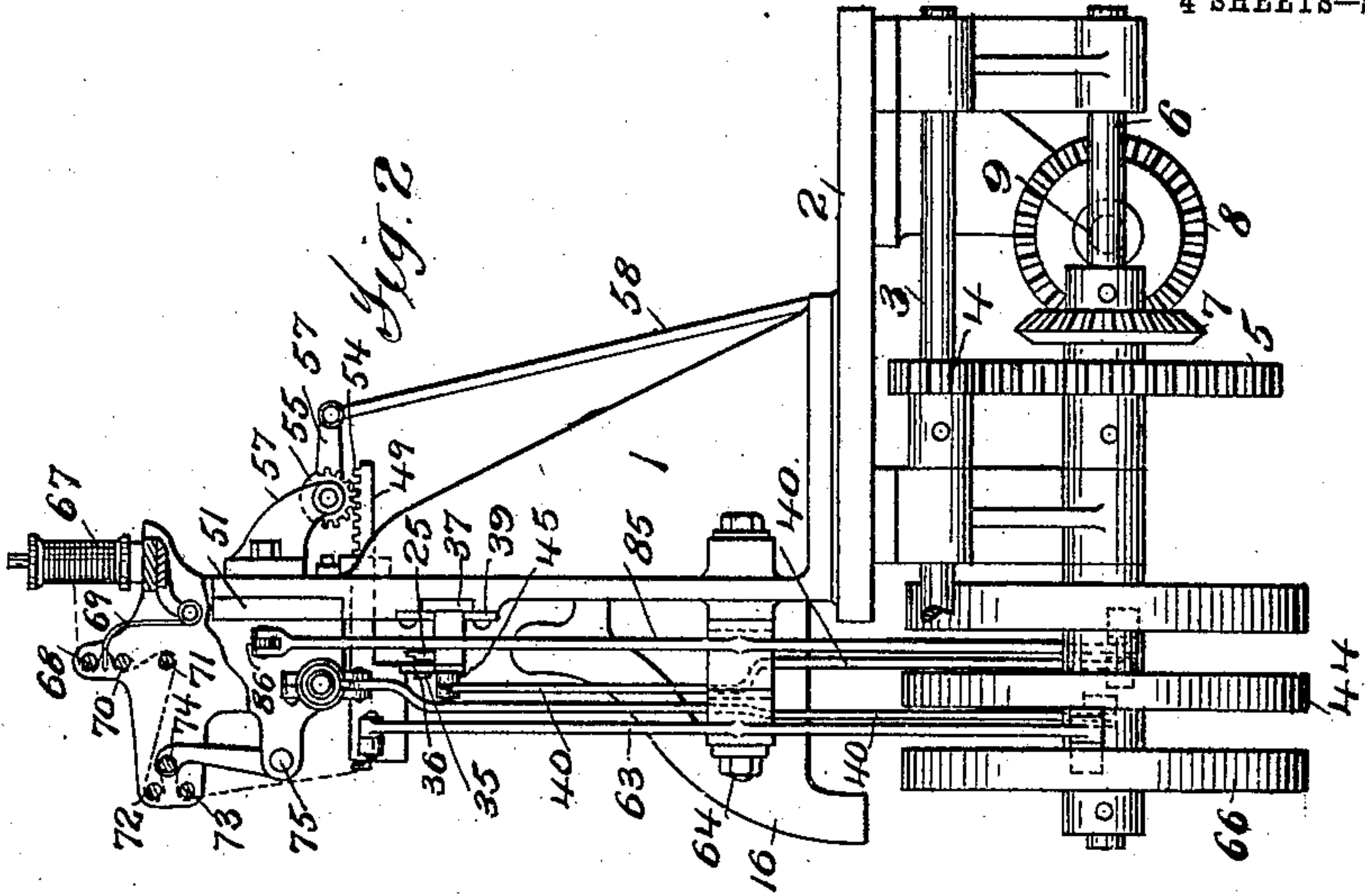
No. 843,099.

PATENTED FEB. 5, 1907.

J. R. REYNOLDS.
SEWING MACHINE.

APPLICATION FILED MAR. 31, 1903.

4 SHEETS—SHEET 1.



Attest:
A. White
W. H. Kennedy.

Fig. 1

Inventor:

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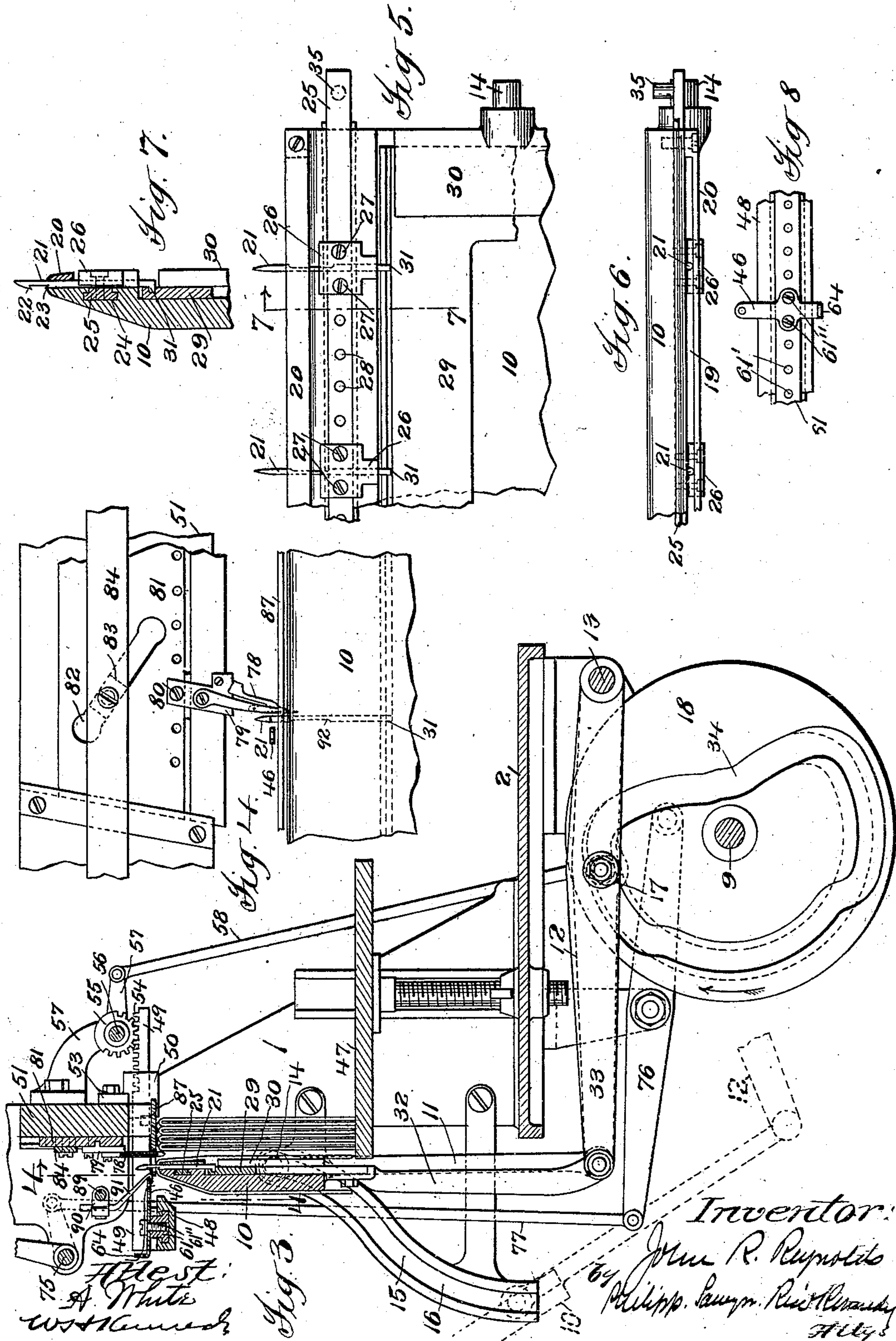
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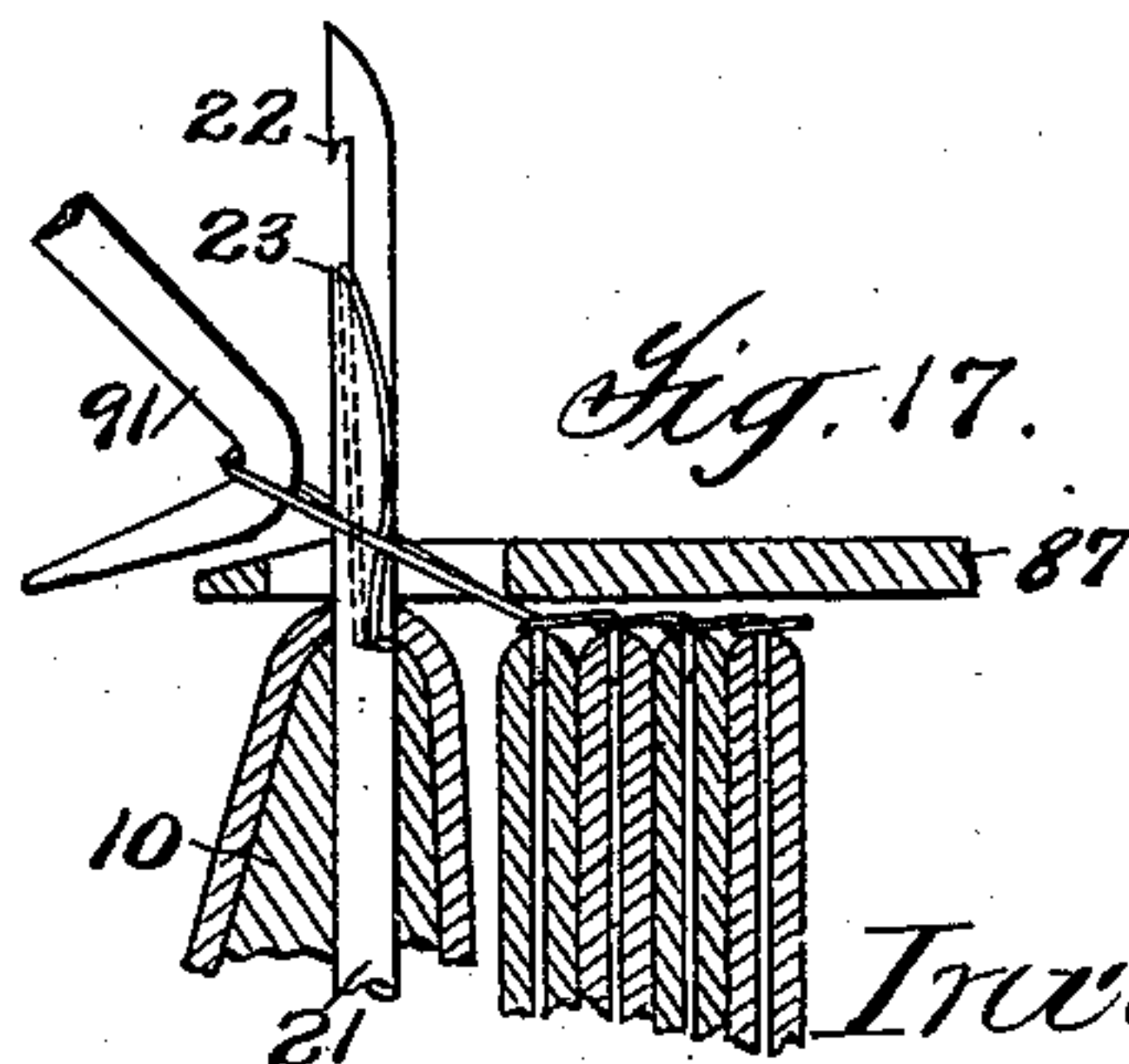
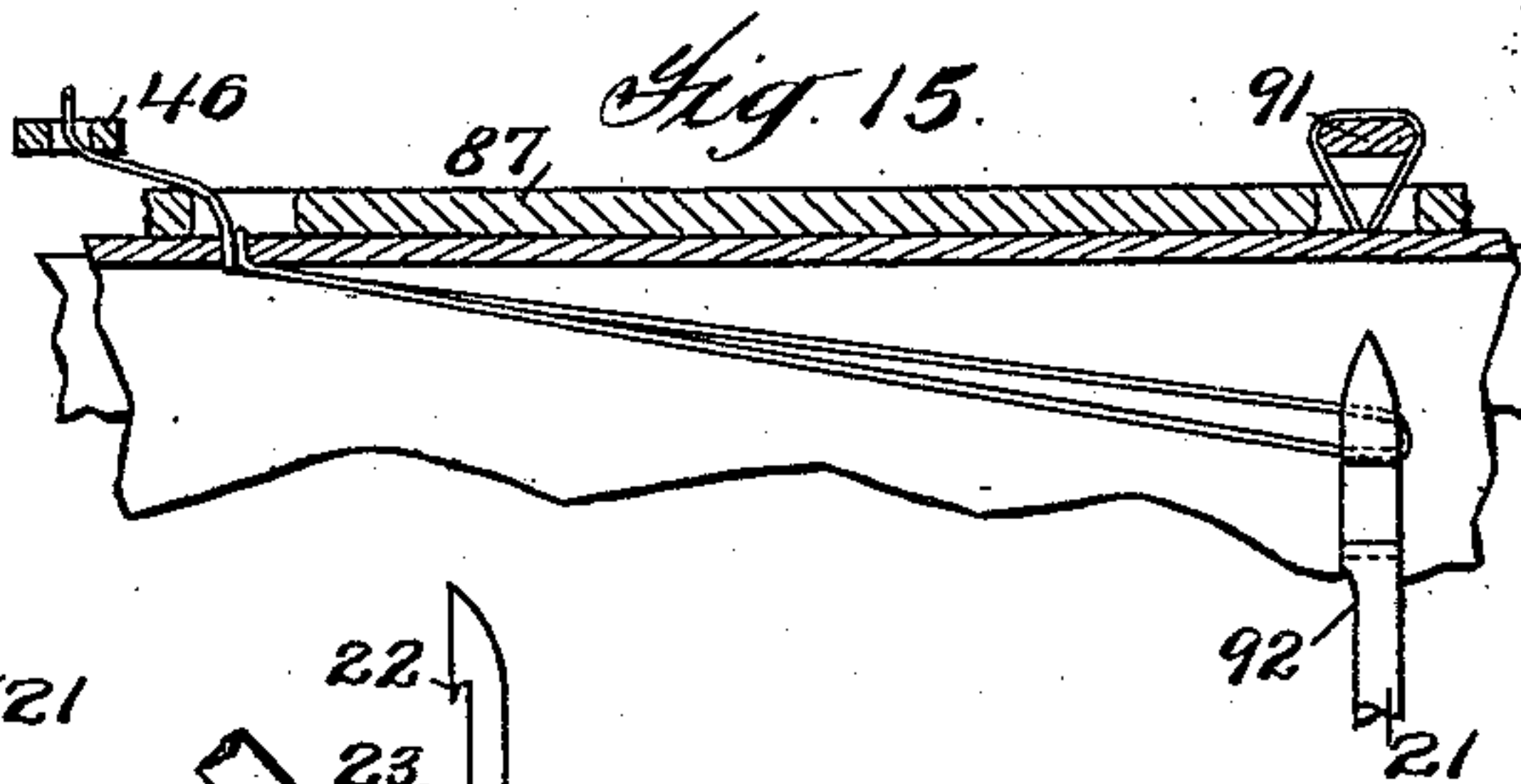
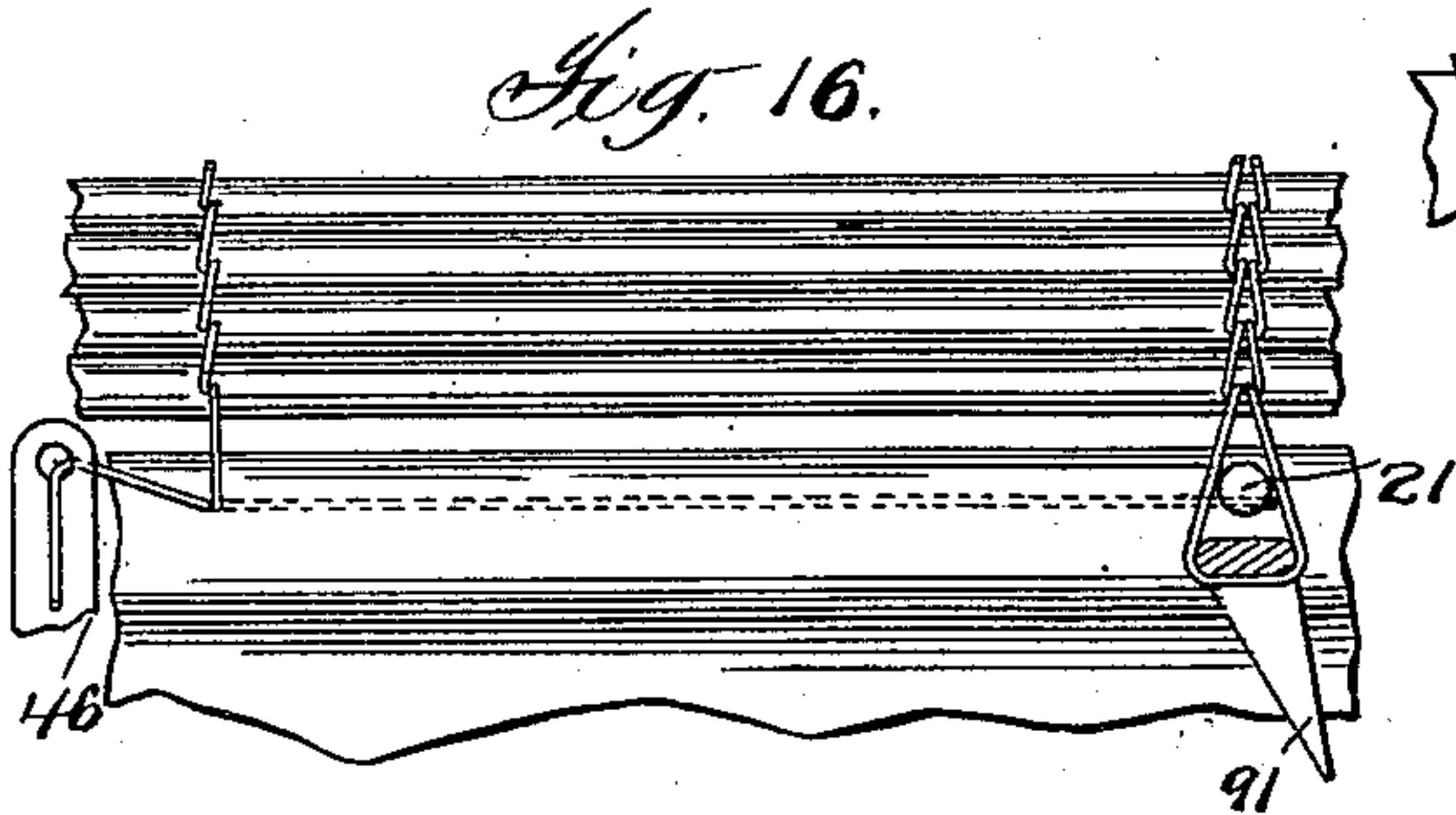
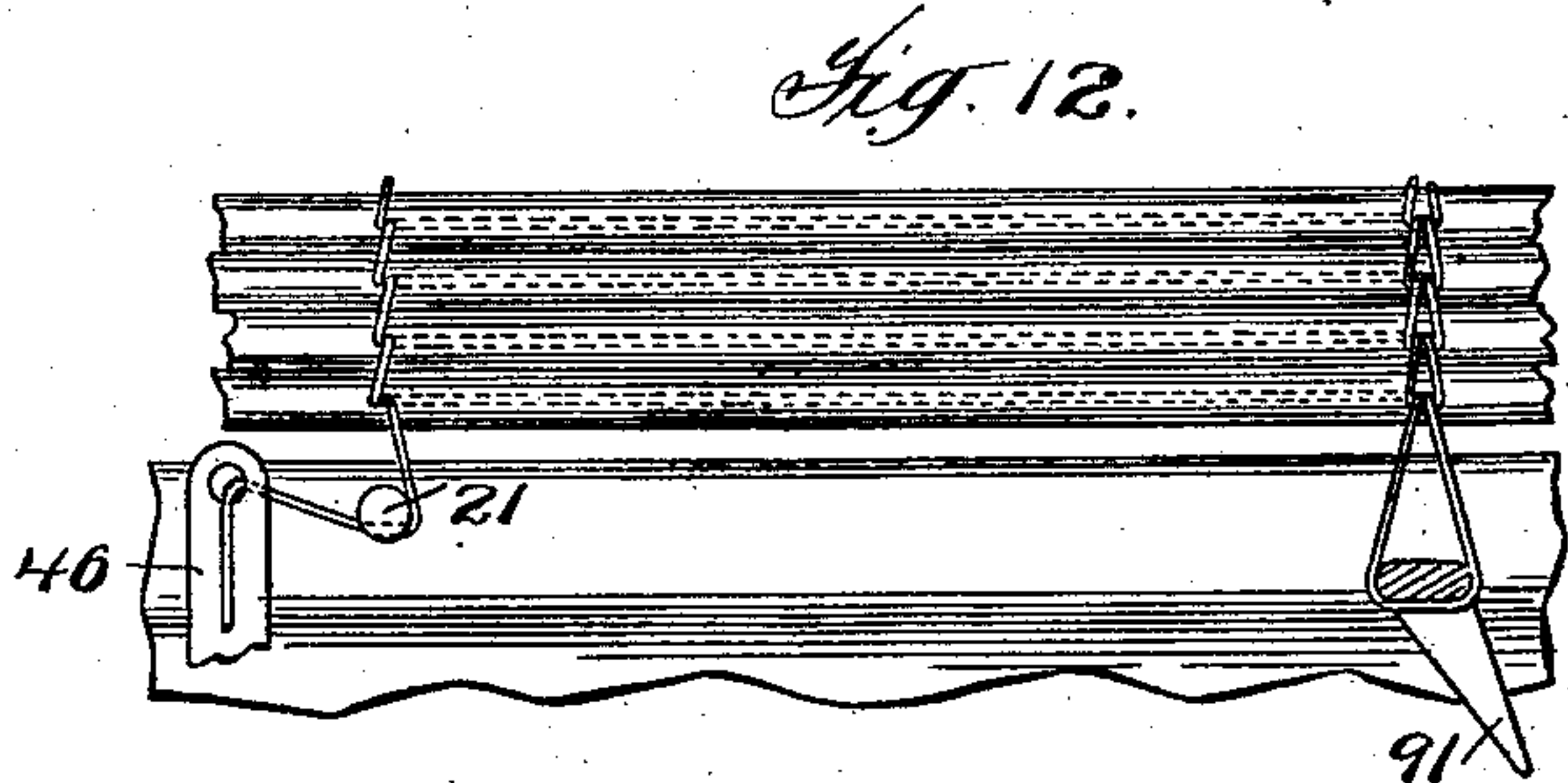
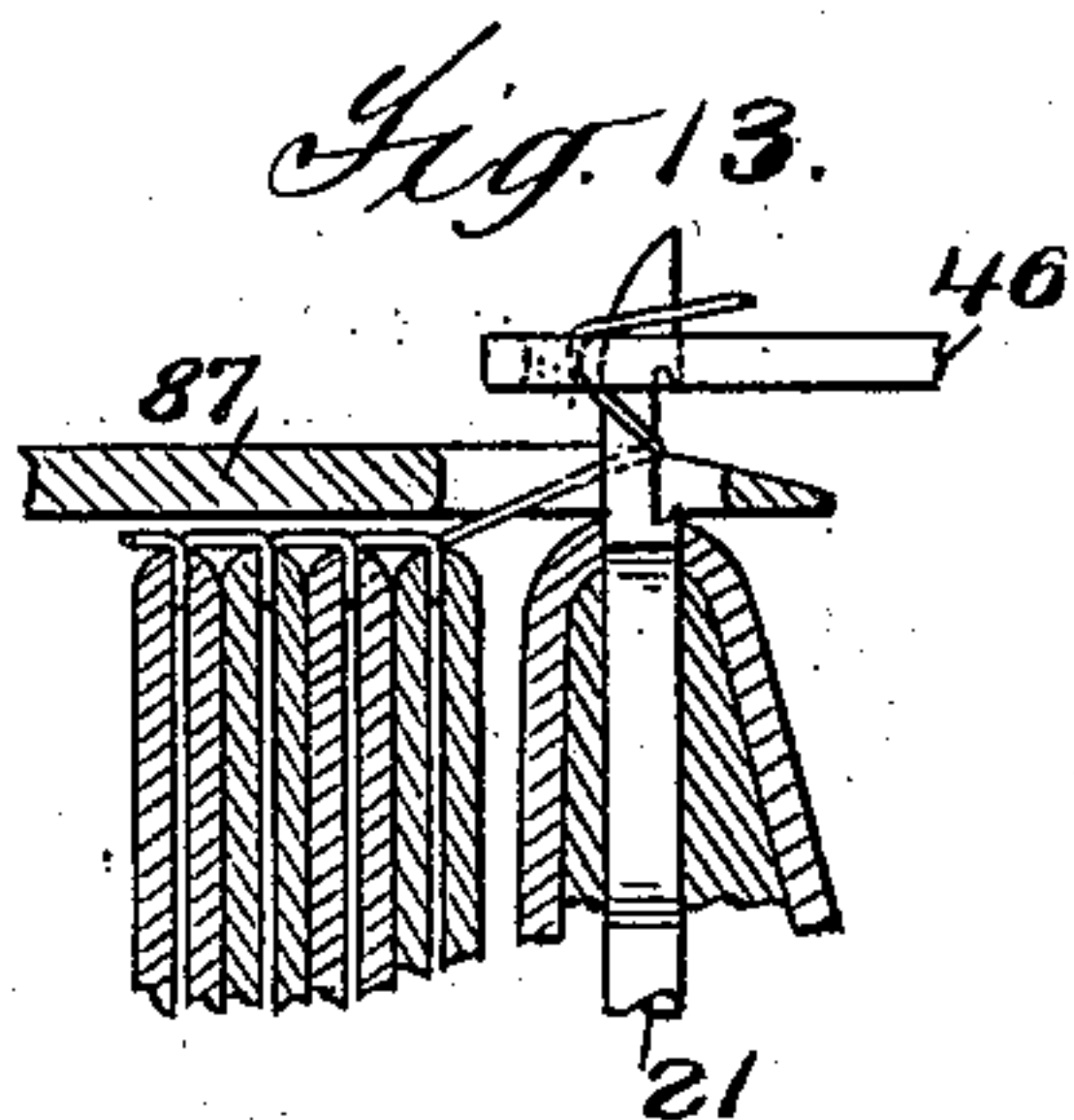
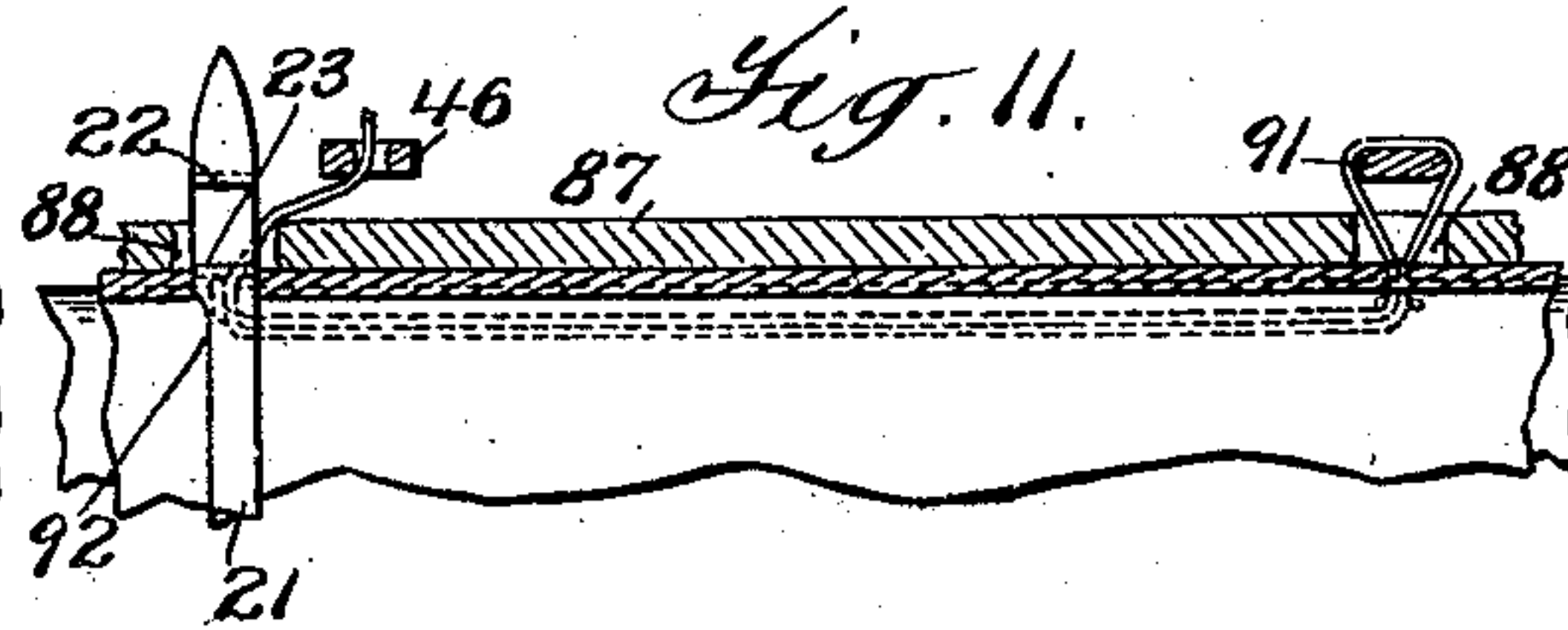
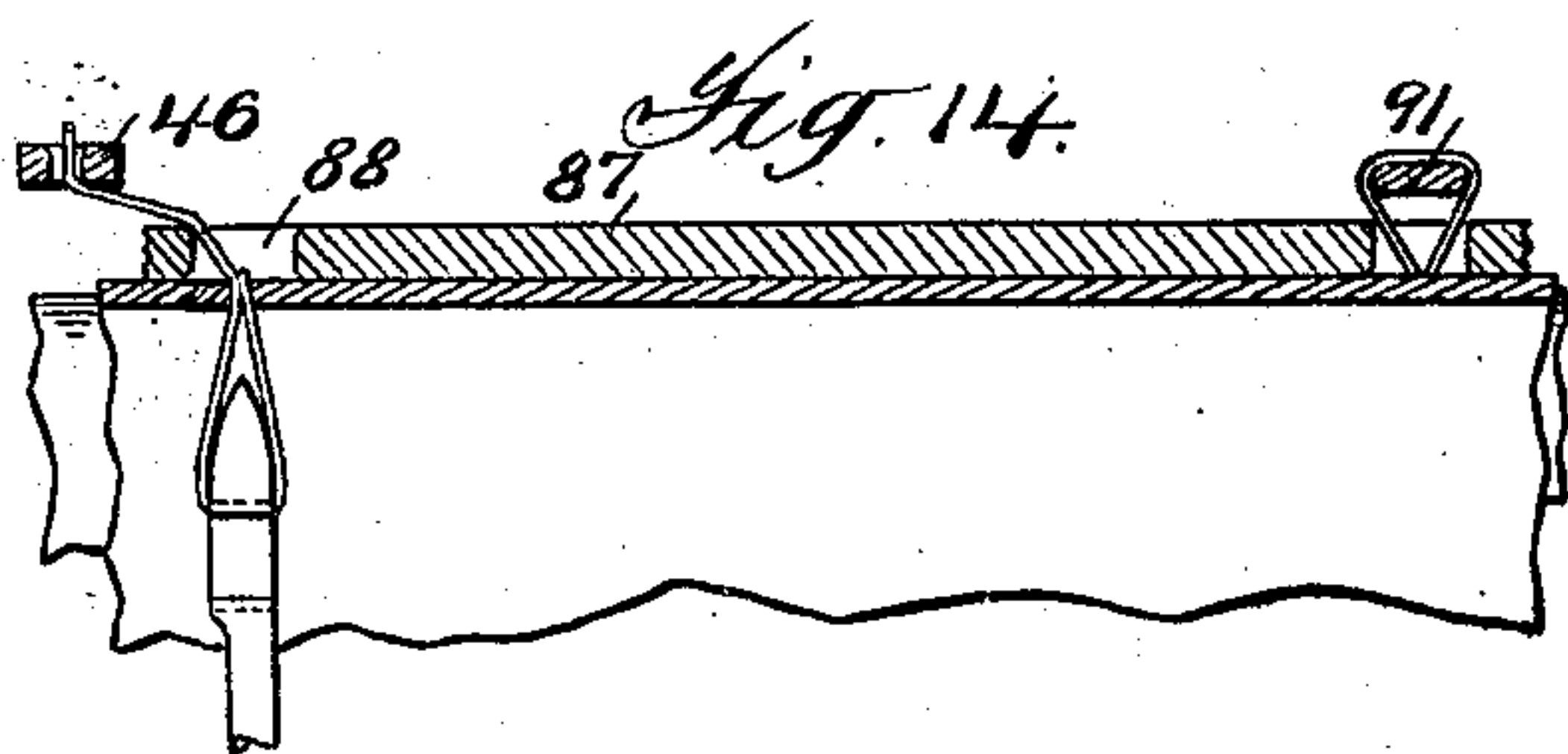
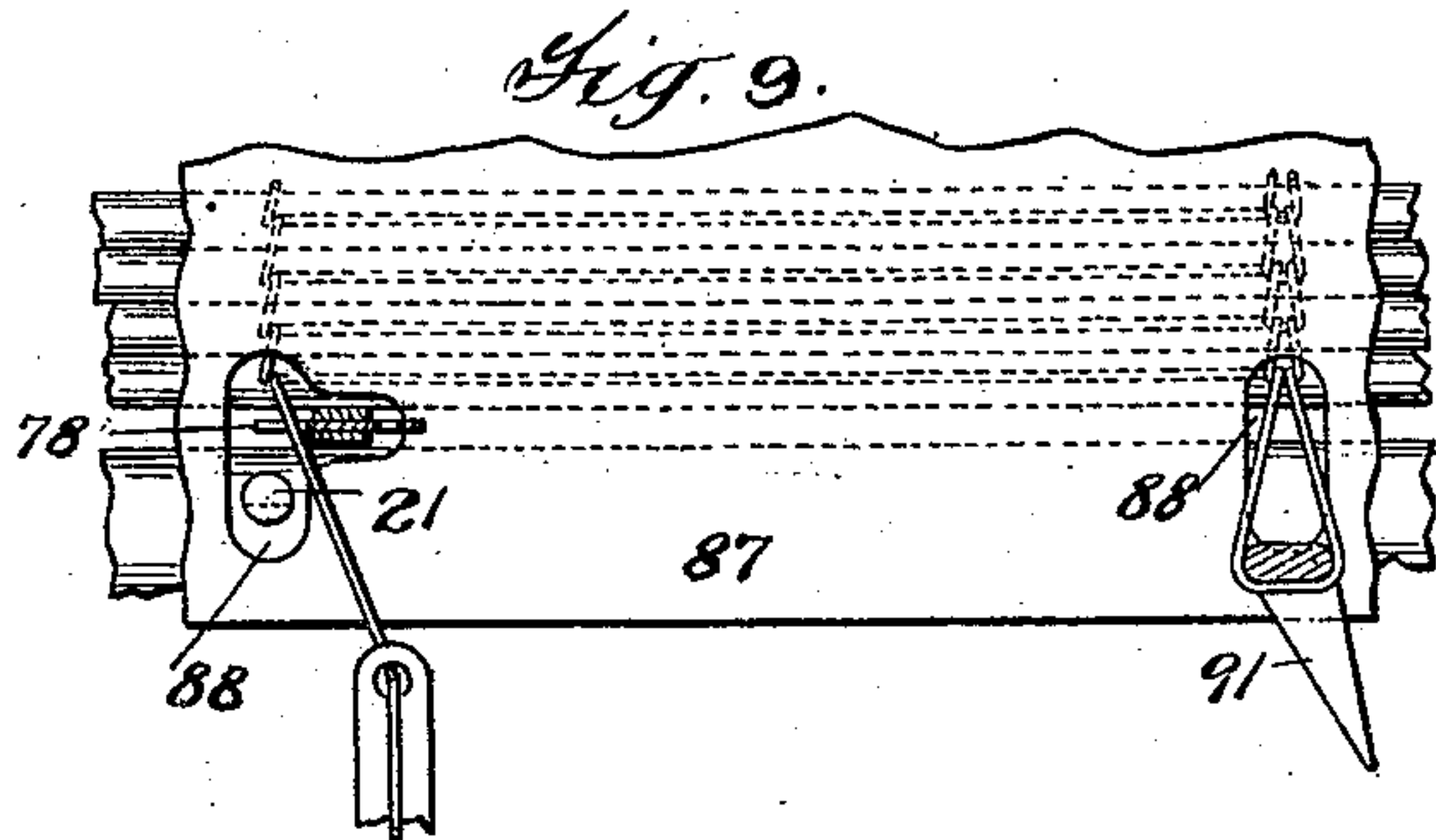
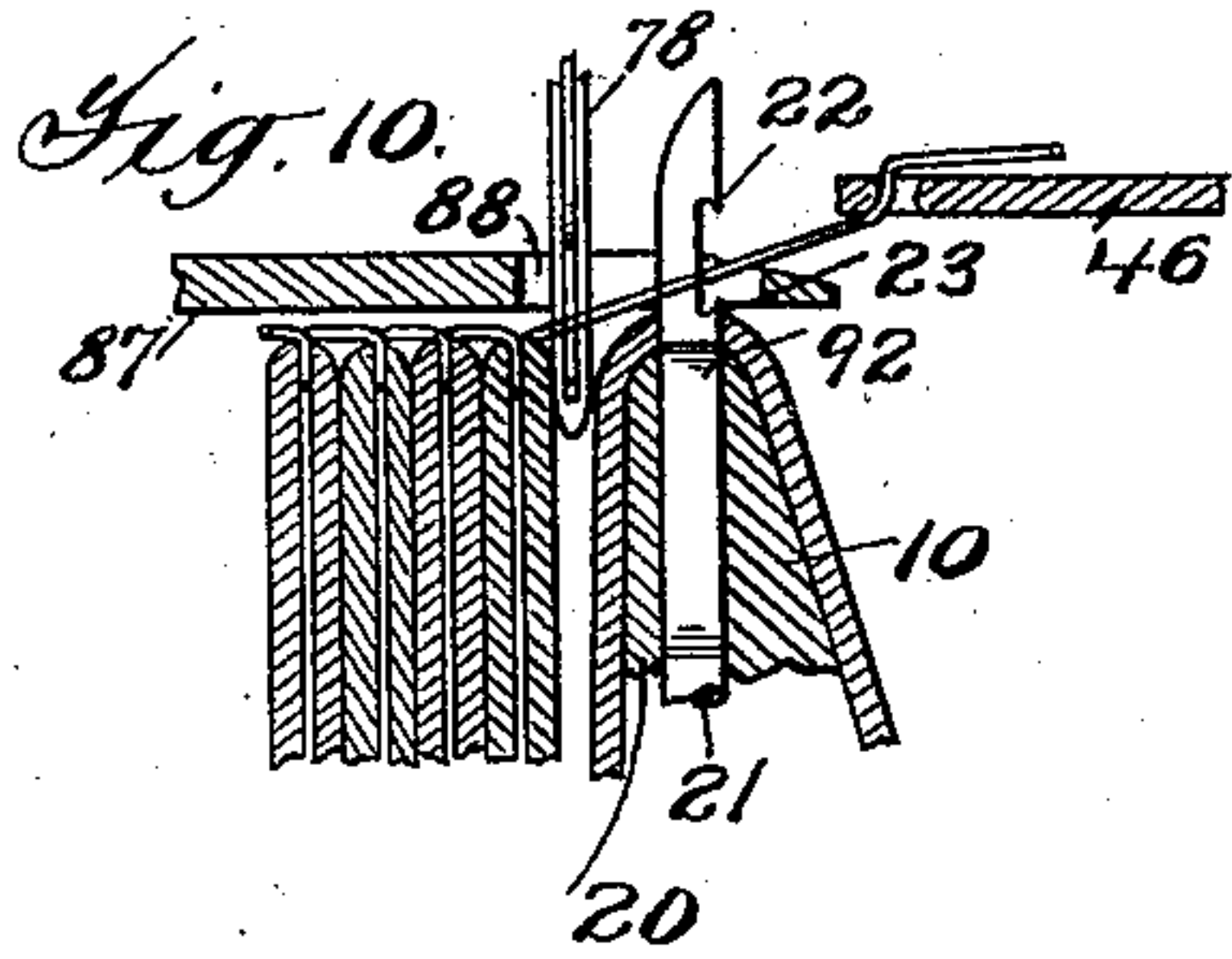
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4 SHEETS—SHEET 3.



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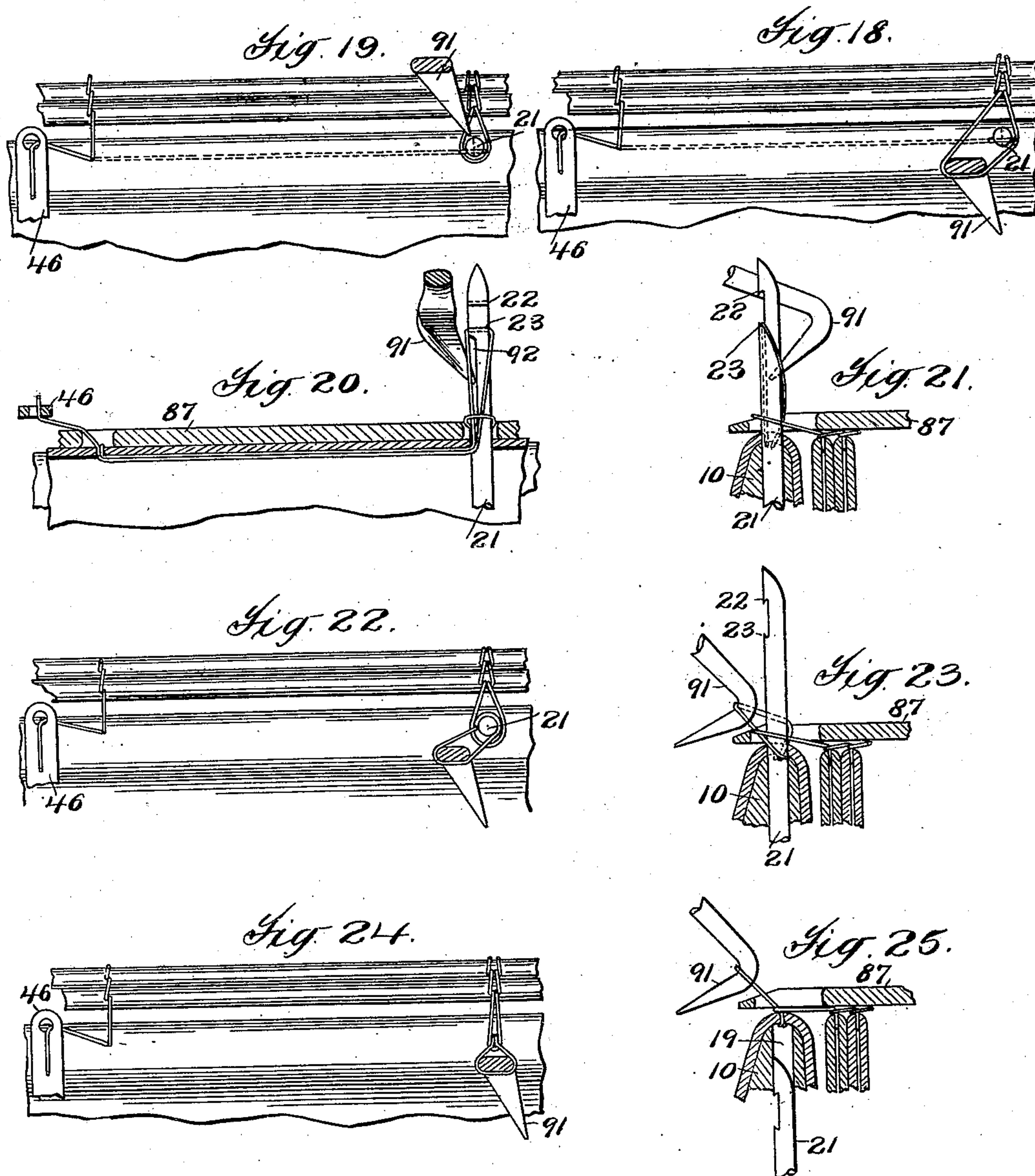
Inventor.
John R. Reynolds
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J. R. REYNOLDS.
SEWING MACHINE.
APPLICATION FILED MAR. 31, 1903.

4 SHEETS—SHEET 4.



Attest:
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Inventor:
John R. Reynolds
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UNITED STATES PATENT OFFICE.

JOHN R. REYNOLDS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE
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A CORPORATION OF CONNECTICUT.

SEWING-MACHINE.

No. 843,099.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed March 31, 1903. Serial No. 150,350.

To all whom it may concern:

Be it known that I, JOHN R. REYNOLDS, a citizen of the United States, residing at Hartford, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to certain improvements in sewing-machines.

In certain sewing-machines as heretofore constructed, and more especially in machines used for sewing together signatures to form books or pamphlets, a work-support is employed on which the signatures rest, said signatures being stationary during the sewing operation. In the best forms of such machines the thread is carried through each signature, along it on the under side, and out again by means of an eye-pointed needle, the loop of the thread being caught by a looper and being held open thereby, so that the needle when it next emerges from the work passes through the loop, its own loop being again caught by the looper. It will of course be understood that a gang of needles are employed in sewing each signature.

The present invention has for its object to produce a sewing mechanism in which a bight of thread is taken by proper instrumentalities carried through, along, and out of the work, the device by which the thread is carried casting the thread off—that is to say, entirely letting go of the thread after it has been brought out of the work, the loop thus formed being taken care of by a suitable instrumentality, depending upon the particular kind of stitch which the machine is intended to produce.

With this and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter fully described and then particularly pointed out in the claims hereunto appended.

In the accompanying drawings, Figure 1 is a front view of the machine embodying the invention. Fig. 2 is a side elevation of the machine shown in Fig. 1, certain parts being shown in section. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a detail view of the take-up mechanism, on an enlarged

scale. Figs. 5 and 6 are detail views illustrating in side view and plan view, respectively, the construction of the work-support and the means for mounting and operating the thread-carrier. Fig. 7 is a section on the line 7 7 of Fig. 5. Fig. 8 is a detail plan view of the thread-presenting device. Figs. 9 to 25, inclusive, are diagrammatic views illustrating the operation of the stitch-forming devices in the formation of a stitch.

The machine which has been selected to illustrate the invention in a concrete form is in its general characteristics the same as a machine well known in the art, the construction of such machine being approximately illustrated in Patent No. 435,613, granted to the Smyth Manufacturing Company, as the assignee of J. R. Reynolds and Arthur I. Jacobs, dated September 2, 1890. It is to be understood, however, that the invention is not to be restricted in its application to the particular machine which has been selected to illustrate it.

Referring to the drawings, the frame of the machine includes a pair of sideframes 1 and a bed-plate 2. Beneath this bed-plate is located the main driving-shaft 3, which is driven from any suitable source of power. This shaft is provided with a pinion 4, meshing with a pinion 5, mounted on a cam-shaft 6, which is provided with a bevel-gear 7, which meshes with a similar gear 8, mounted on a shaft 9, running across the machine. The shafts 6 and 9 serve to support the cams by which the various parts of the machine are operated.

The work-support employed may be of any desired construction. The form illustrated, however, is generally the same as that illustrated in the patent above referred to. It comprises a bar 10, which is provided with downward legs or extensions 11, which are or may be integral with the bar. These legs or extensions are pivoted to levers 12, mounted on a cross-rod 13, suitably supported on the under side of the bed-plate 2. The bar 10 is provided with guide-studs 14, which engage suitable cam-grooves 15 in guides 16, which are secured to the side frames of the machine. The levers 12 are provided with studs 17, (see dotted lines in Fig. 3,) which engage with cam-grooves in the outer faces

of cam-disks 18, mounted on the cam-shaft 9. As the shaft revolves these cam-grooves serve to give the levers 12 an oscillating movement by which the bar 10 is moved into and out of position, said bar by the action of the cam-grooves 15 being thrown forward into the position indicated by dotted lines in Fig. 3, in which position the operator can conveniently place the signatures or other work to be sewn thereon. The bar 10 is provided at its top with a slot or recess 19, formed by securing a bar 20 thereto in a manner clearly illustrated in Fig. 6.

It will be understood that in a machine embodying the invention a bight of thread is taken by the thread-carrying instrumentality, or by each of them, when a plurality of such instrumentalities are employed, above the work, carried down through it, moved along it, and then carried outward through the work, after which the thread is cast off or delivered by the thread-carrying device, the thread being wholly freed from said device.

The thread-carrying device referred to may be widely varied in construction. As shown, it consists of a hook, well illustrated in the diagrams Figs. 9 to 25, inclusive, said hook being marked 21. This hook is provided with two oppositely-arranged shoulders 22 and 23. In the particular construction shown the hook is mounted below the work. After the hook has passed up through the work—and it may be here remarked that it may either perforate the work itself as it passes through it or it may pass through perforations already formed by suitable instrumentality—it descends with a bight of thread, as is shown in Fig. 14, for instance, the thread resting against and being retained by the upper shoulder of the hook. The hook is then given a movement along the work and again passes up through it, the thread during this movement of the hook being transferred from the shoulder 22 to the shoulder 23, so that it rests against and is held by that shoulder.

The construction by which the hook or hooks is mounted and operated may be widely varied and will be varied according to the particular construction of the machine in which the hook is employed and according to its position in the machine. In the construction shown the bar 10 is provided with a groove 24, (see Fig. 7,) in which is mounted a shouldered bar 25. To this bar are secured in any suitable manner blocks 26. In the preferred form of the construction these blocks will be adjustable along the bar, and in the construction shown they are secured to the bar by means of screws 27, the bar being provided with a series of threaded perforations 28, which are so located that any desired adjustment of the blocks may be had. Each of the blocks 26 serves to retain in position one of the hooks 21, the hooks being so held be-

tween the bar and the blocks that they may be given a vertical movement.

The construction by which the hooks are given the vertical movement referred to may be of any suitable character. As shown, there is provided a grooved bar 29, which is held in position with respect to the bar 10 by means of guiding blocks or cheeks 30, formed on said bar, the hooks 21 having their lower ends intumed, as at 31. The bar 29 has depending therefrom legs or extensions 32, which are pivoted to levers 33, mounted on the cross-rod 13, before referred to, these levers 33 having studs which engage cam-grooves 34 in the disks 18, mounted on the shaft 9. By this construction it is obvious that the hooks may be moved from a position within the bar 10 to a position outside of it, the hooks passing through the slot 19, and they may at the same time move with the work-support as it swings from the position where it receives the work to the position where the sewing is to be effected.

After the hooks have been carried up through the work, have taken the bights of thread, and have drawn these bights down through the work they must, in the construction shown, be given a movement along the work in order to bring them into position to be again carried through it. While this side-wise movement may be effected in any desired manner, in the construction shown it is accomplished by moving the bar 25. The movements may be given to this bar by any suitable mechanism. As shown, however, the bar is provided at one of its ends with a pin 35, which is engaged by a gab-hook 36, (see Fig. 3,) which is mounted on a slide 37, which reciprocates in a groove 38 in one of the side frames, the slide being held in the groove by plates 39. The movement of the gab-hook slide is effected by means of a lever 40, which is pivoted on a stud 41, extending outward from the side frame, the lower end of this lever being provided with a bowl or stud 42, which engages with a cam-groove 43 in a disk 44, mounted on the shaft 6, before referred to. The upper end of this lever 40 is connected, by means of a link 45, to a pin on the outer end of the gab-hook 36. (See Fig. 1.)

The devices for presenting thread to the hook or to the plurality of hooks when more than one is employed may be varied widely in construction. In the construction illustrated, however, which is a preferred form, the thread will be presented to the hook in the first instance so that the hook may take the bight before referred to by means of a perforated plate 46, through which the thread passes, and this plate or the plurality of plates when more than one hook is employed will in the preferred construction be given a movement from one side of the path of the hook to the other side and then a rearward

movement, by which the thread is wrapped around the hook, so that the engagement of the hook therewith is insured. The movement of this thread-presenting plate will be well understood by referring to the diagrams, Figs. 9 and 12, Fig. 9 illustrating the position of the plate before it begins its movement and Fig. 12 illustrating its position after it has completed its movement. The construction by which this thread-presenting plate is mounted and operated may be widely varied and will be varied according to the type of machine in which the invention is embodied.

In the particular machine which has been selected to illustrate the invention the signatures, after being sewed, are delivered to a receiving-plate 47, which is adjustably mounted on the bed-plate 2 by a construction which it is unnecessary to describe fully, as it is fully described in the patent before referred to. As the work-support withdraws after the sewing has been effected the signatures are delivered to this receiving-plate by devices, among which is a pusher-bar 48. This pusher-bar 48 is carried by slides 49, which work in guides 50, located on the underside of a bar 51, which forms a part of the frame, these guides being clearly shown in Fig. 3 and being secured to the bar 51 by means of screws 53 or in any other suitable manner. The rear end of the slides 49 are provided with rack-teeth 54, and these rack-teeth are engaged at each end of the machine by the toothed segments 55, which are mounted on a shaft 56, supported in hangers 57, extending from the bar 51. This shaft 56 has extending from it an arm 57, to which is connected a rod 58, said rod having on its lower end a bowl 59, which engages a cam-groove in a disk 60, mounted on the shaft 9, before referred to.

In the particular machine selected for illustrating the invention, the pusher-bar 48 forms a convenient means for supporting the thread-presenting plates 46 and is accordingly utilized for that purpose, the movement of the pusher-bar being timed as to give the inward movement before referred to to the thread-presenting plates.

The construction by which the presenting plate or plates are connected to the pusher-bar may be varied within wide limits. As shown, there is mounted in this bar a slide 61, said slide being provided with a series of pairs of holes 61'. Each thread-presenting plate is provided with a pair of perforations through which pass screws 61'', which secure the presenting-plates to the slide. In the preferred form of the construction the outer end of each of the presenting-plates will be turned up, as shown at 64, and these up-turned ends will be perforated for the passage of the thread.

The slide may be given its movement by

any suitable means. As shown, the end of this slide has pivoted to it a link 62, said link being in turn pivoted to a lever 63, which is mounted on a stud 64, extending from one of the side frames, the lower end of this lever 63 being provided with a bowl 65, which engages a cam-groove on the inner face of a cam-disk 66, mounted on the shaft 6, before referred to. This cam-disk will be so timed as to give the slide its shifting movement after the hooks have been carried upward through the work on the work-support, and after this movement of the slide has taken place the inward movement of the pusher-bar occurs, by which movement the presenting-plates are carried inward and the thread is wrapped about the hooks. It may be here remarked that the movement of the pusher-bar by which the presenting-plates are given this inward movement is not the movement by which the sewn signatures are delivered to the receiving-plate; but it is a preliminary movement having for its purpose the positioning of the presenting-plates.

The mechanisms by which the thread is controlled prior to its delivery to the thread-presenting devices and the mechanisms for drawing the stitch tight may be of any suitable character. The constructions shown for these purposes are substantially the same as those illustrated in Patent No. 435,613, before referred to, and reference is made to said patent for a full description thereof. For the purposes of this application it is sufficient to say that the thread is taken from a series of spools, one of which is shown, (marked 67,) is led around a bar 68, through the eye of a spring 69, and over guides 70 and 71. From the guide 71 it passes over two bars 72 and 73, in connection with which works a take-up and pull-off bar 74, mounted on arms extending from a rock-shaft 75. This rock-shaft is operated from a groove in a cam-disk 60, through a lever 76 and a connecting-rod 77.

While any suitable form of take-up mechanism may be employed, that shown is the same as that illustrated in the patent before referred to, and reference is made thereto for a full description of the same. For the purposes of this application it is sufficient to say that the take-up mechanism embodies a series of small levers 78, (see Fig. 4,) one of these levers being employed, of course, for each hook employed. Each of these levers 78 is carried on a bracket 79, these brackets being secured by screws 80 to a plate 81, which is given a vertical movement in the machine, this vertical movement being effected by means of inclined guide-slots 82, which operate in connection with blocks 83, secured to a bar 84, movably mounted on the front of the machine. The movement of the plate 81 is effected through a cam-lever 85, having a link connection 86 with the bar 84.

The position of the presser-plate for holding the work on the work-support will be varied according to the style of machine in which the invention is embodied. When, as in the machine selected to illustrate the invention, the thread-carrying devices are located in and work vertically through a work-support, the presser-plate will be located above the support. In the construction shown this presser-plate is marked 87 and is secured to the under side of the bar 51, before referred to. The presser-plate is provided with slots or openings 88, through which the hooks pass, these slots in the construction illustrated being large enough to permit the take-ups to also pass there-through.

The devices which receive the bight of thread after it has been delivered by the thread-carrier may be considerably varied. In the preferred form of the construction, however, and as shown, these devices will embody a series of loopers, one for each hook. The means by which these loopers are mounted and operated may be widely varied and will vary according to the construction of the machine in which the invention is embodied. As shown, there is located on the front of the machine a looper-shaft 89, mounted in brackets secured to the frame of the machine. Secured to this shaft is a series of blocks 90, each of said blocks being provided with a hooked looper 91. In the operation of the machine each looper holds open a loop to be entered by a hook as it comes up through the work carrying its bight, and at this time, therefore, the looper is standing in front of the hook. The looper-shaft is accordingly given a sidewise movement to clear the loopers from the hooks, after which this shaft is rocked to cause each looper to cast off its loop around the bight of thread held by a hook. After casting the loop off the looper-shaft is rocked forward in order to enable the looper to take the bight from the hook. In the preferred construction the hook-shank will be recessed cut at 92, as clearly shown in Fig. 20, for instance, so that the point of the looper may readily get between the thread and the shank of the hook. The means for operating the looper-shaft may be of any suitable form, but will preferably be that described in the patent before referred to, and reference is made to said patent for a full disclosure thereof.

The operation of the stitch-forming devices will be clearly understood from a consideration of the diagrams Figs. 9 to 25, inclusive. Fig. 9 shows in plan view and Figs. 10 and 11 in section the position of the hook and the thread-presenting device before the thread has been carried within the reach of the hook, and it also shows the looper holding open the loop of the previous stitch. Figs. 12 and 13 show the position of the hook

and the thread-presenting device 46 after the thread-presenting device has been given the movement to carry the thread into the position where its bight can be taken by the hook. Fig. 14 shows the position of the parts after the hook has taken the bight of thread and has moved with it below the work into the position where it is ready to be given its movement along the work. Fig. 15 shows the position of the hook after it has been given its movement along the work. Figs. 16 and 17 show in plan view and section, respectively, the position of the looper and the hook after the hook has passed out through the work and through the loop held open by the looper. It will be noted that the thread which had been previously held against and retained by the shoulder 22 of the hook has now changed its position and is resting against the shoulder 23 of the hook. Fig. 18 illustrates the position of the looper after it has received the sidewise movement given by the shaft of the looper and before the shaft has been rocked to cause the loopers to cast off the loops. Fig. 19 represents the position of these parts after the loop has been dropped by the looper and before the looper takes the bight of thread from the hook. Figs. 20 and 21 illustrate in front and side view the position of the looper and hook at the time when the looper is moving forward to take the bight of thread from the hook, the point of the looper being shown as entering the recess in the side of the hook. Figs. 22 and 23 illustrate in plan and side view, respectively, the position of the hook and looper after the looper has taken the bight of thread from the hook and before the hook retires. Figs. 24 and 25 illustrate in plan and section, respectively, the position of the various parts after the hook has been withdrawn into the work-support and before it begins its movement back along the work to be again carried through it to receive a fresh bight of thread.

The construction by which the invention is carried into effect may be varied within wide limits. The invention is not, therefore, to be limited to the specific mechanism and construction which has been hereinbefore described and which is illustrated in the accompanying drawings.

What is claimed is—

1. In a book-sewing machine, the combination with means for successively presenting signatures to be sewed, of a work-support, a thread-presenting device, means for taking a bight of thread from said device and carrying it into the work in one direction and out of the work in a different direction, a looper, and means for operating the looper to cast a previous loop around the bight and take the bight from the carrying means.

2. In a book-sewing machine, the combination with means for successively presenting signatures to be sewed, of a work-sup-

port, a thread-presenting device, a thread-carrier, means for operating the carrier to take a bight of thread and carry the bight into the work in one direction and out of the work in a different direction, and a looper operating to take the bight after it has been carried out of the work.

3. In a book-sewing machine, the combination with means for successively presenting signatures to be sewed, of a work-support, a thread-presenting device, a thread-carrier, means for operating the carrier to cause it to take a bight of thread from the thread-presenting device, carry it into the work in one direction and out of the work in a different direction, and a looper operating to hold open a previous loop through which the bight is carried, cast the loop around the bight, and to take the bight from the carrier.

4. In a book-sewing machine, the combination with means for successively presenting signatures to be sewed, of a work-support, a hook having oppositely-arranged shoulders, means for presenting a thread thereto, means for giving the hook a movement to carry it into the work and out again on the entrance side thereof, the thread resting against one of the shoulders as the hook passes into the work and against the other shoulder as it passes out of the work, a looper, means for operating the looper to cast a loop over the thread held by the hook and to remove the thread therefrom, substantially as described.

5. In a book-sewing machine, the combination with means for successively presenting signatures to be sewed, of a work-support, a straight hook having oppositely-arranged shoulders, means for presenting a thread thereto, means for giving the hook a movement to carry it into and out of the work, the thread resting against one of the shoulders as the hook passes into the work and against the other shoulder as it passes out of the work, a looper, and means for operating the looper to cast a loop over the thread held by the hook and to remove the thread therefrom, substantially as described.

6. In a sewing-machine, the combination with a work-support, of a hook having oppositely-arranged shoulders, means for presenting thread to the hook, means for operating the hook to cause it to pass into, along, and out of the work, the thread resting against one of the shoulders as the hook passes into the work and against the other shoulder as it passes out of the work, a looper, means for actuating the looper to cause it to hold open the loop through which the hook passes as it comes out of the work, to cast off said loop, and to take the thread from the hook, substantially as described.

7. In a sewing-machine, the combination with a work-support, of a straight hook having oppositely-arranged shoulders, means for

presenting thread to the hook, means for operating the hook to cause it to pass into, along, and out of the work, the thread resting against one of the shoulders as the hook passes into the work and against the other shoulder as it passes out of the work, a looper, means for actuating the looper to cause it to hold open the loop through which the hook passes as it comes out of the work, to cast off said loop, and to take the thread from the hook, substantially as described.

8. In a sewing-machine, the combination with a work-support, of a hook-carrier, a hook having oppositely-arranged shoulders mounted therein, means for actuating the hook independently of the carrier to cause it to pass into and out of the work, means for giving the carrier movements to carry the hook along the work, a looper, and actuating means therefor, substantially as described.

9. In a sewing-machine, the combination with a work-support, of a presser-plate between which and the support the work is held, a hook-carrier, a hook having oppositely-arranged shoulders mounted in the carrier, means for actuating the hook independently of the carrier to cause it to move through the work in both directions at different points, means for reciprocating the carrier, and means for presenting thread to the hook, the thread resting against one shoulder of the hook as the hook passes through the work in one direction and against its other shoulder as it passes through the work in the opposite direction, a looper, and actuating means therefor, substantially as described.

10. In a sewing-machine, the combination with a work-support, of a presser-plate located thereover, a hook having oppositely-arranged shoulders located in the support, means for causing the hook to move through the work in both directions at different points, a thread-presenting device operating to present thread to be taken by one shoulder of the hook at one of said points, a looper for taking the thread from the other shoulder of the hook at the other point, and means for operating the looper to cast a loop onto the hook and take the thread therefrom, substantially as described.

11. In a sewing-machine, the combination with a work-support, of a presser-plate located thereover, a hook-carrier mounted in the work-support, a hook having oppositely-arranged shoulders mounted in the carrier, means for actuating the hook to move through the work in both directions at different points, means for operating the carrier to move the hook from one of said points to the other, a thread-presenting device operating at one point, and a looper operating at the other point, substantially as described.

12. In a sewing-machine, the combination with a work-support, of a presser-plate lo-

cated thereover, a hook-carrier mounted in the work-support, a hook having oppositely-arranged shoulders mounted in the carrier, means for actuating the hook to move through the work in both directions at different points, means for operating the carrier to move the hook from one of said points to the other, a thread-presenting device operating at one point, a looper operating at the other point, and means for actuating the looper to cause it to hold the loop through which the hook passes as it comes out of the work, to cast off said loop, and take the thread from the hook, substantially as described.

13. In a book-sewing machine, the combination with means for successively presenting signatures to be sewed, of a hook having oppositely-arranged shoulders and a cut-away side, means for carrying the hook into the work and out again in the entrance side thereof, a looper located at a point where the hook passes out of the work, and means for operating the looper to cast off a previously-held loop and to take a bight from the needle, substantially as described.

14. In a book-sewing machine, the combination with means for successively presenting signatures to be sewed, of a straight hook having oppositely-arranged shoulders and a cut-away side, means for carrying the hook into the work and out again on the entrance side thereof, a looper located at a point where the hook passes out of the work, and means for operating the looper to cast off a previously-held loop and to take a bight from the needle, substantially as described.

15. In a sewing-machine, the combination with a work-support, of a hook having oppositely-arranged shoulders and a cut-away side, means for presenting thread to the hook so that it will be taken by one of the shoulders, means for operating the hook to cause it to pass into, along and out of the work, a looper located at the point where the hook comes out of the work, and means for operating the looper to cast off a previously-held loop and to take a bight from the needle, substantially as described.

16. In a sewing-machine, the combination with a work-support, of a straight hook having oppositely-arranged shoulders and a cut-away side, means for presenting thread to the hook so that it will be taken by one of the shoulders, means for operating the hook to cause it to pass into, along and out of the work, a looper located at the point where the hook comes out of the work, and means for operating the looper to cast off a previously-held loop and to take a bight from the needle, substantially as described.

17. In a sewing-machine, the combination with a work-support, of a presser-plate between which and the support the work is held, a straight hook having oppositely-arranged shoulders and a cut-away side, means

for presenting thread to the hook so that it will be taken by one of the shoulders, means for operating the hook to cause it to pass into, along and out of the work, a looper located at the point where the hook comes out of the work, and means for operating the looper to cast off a previously-held loop and to take a bight from the needle, substantially as described.

18. In a sewing-machine, the combination with a work-support, of a hook having oppositely-arranged shoulders, a thread-presenting device, means for moving said device from one side of the path of the hook to the other and rearwardly with respect to said path, means for causing the hook after taking the thread to pass into, along and out of the work, the thread resting against one of the shoulders as the hook passes into the work and against the other shoulder as it passes out of the work, a looper, and actuating means therefor, substantially as described.

19. In a sewing-machine, the combination with a work-support, of a straight hook having oppositely-arranged shoulders and a cut-away side, a thread-presenting device, means for moving said device from one side of the path of the hook to the other and rearwardly with respect to said path, means for causing the hook after taking the thread to pass into, along and out of the work, the thread resting against one of the shoulders as the hook passes into the work and against the other shoulder as it passes out of the work, a looper, and actuating means therefor, substantially as described.

20. In a sewing-machine, the combination with a work-support, of a presser-plate between which and the support the work is held, a hook-carrier located in the support, a hook having oppositely-arranged shoulders loosely mounted in the carrier, means for actuating the hook independently of the carrier to cause it to move through the work in both directions, means for reciprocating the carrier, a thread-presenting device, means for moving said device from one side of the path of the hook to the other and rearwardly with respect to said path, a looper, and actuating devices therefor, substantially as described.

21. In a sewing-machine, the combination with a work-support, of a presser-plate between which and the support the work is held, a hook-carrier located in the support, a straight hook having oppositely-arranged shoulders and a cut-away side, said hook being loosely mounted in the carrier, means for actuating the hook independently of the carrier to cause it to move through the work in both directions, means for reciprocating the carrier, a thread-presenting device, means for moving said device from one side of the path of the hook to the other and rearwardly with respect to said path, a looper, and actu-

ating devices therefor, substantially as described.

22. In a sewing-machine, the combination with a work-support, of a presser-plate 5 mounted thereover, a carrier-block, a hook having oppositely-arranged shoulders mounted therein, a slide with which the hook engages, means for reciprocating the slide, means for reciprocating the carrier-block at 10 an angle with respect to the movement of the slide, a thread-presenting device, a looper, and actuating devices therefor, substantially as described.

23. In a sewing-machine, the combination 15 with a work-support, of a presser-plate mounted thereover, a carrier-block, a hook having oppositely-arranged shoulders mounted therein, a slide with which the hook engages, means for reciprocating the slide, 20 means for reciprocating the carrier-block at an angle with respect to the movement of the slide, a thread-presenting device, and means for giving it a movement from one side of the path of the hook to the other and rearwardly 25 with respect to said path, a looper, and actuating means therefor, substantially as described.

24. In a sewing-machine, the combination with a work-support, of a presser-plate, a 30 hook having oppositely-arranged shoulders, means for reciprocating the hook through and along the work, a thread-presenting device, a carrier on which said device is mounted, means for moving the carrier toward and 35 away from the hook, means for reciprocating the presenting device with respect to the carrier whereby the thread-presenting device is carried from one side of the path of the hook to the other and rearwardly with respect to said path, a looper, and actuating means 40 therefor, substantially as described.

25. In a sewing-machine, the combination with a work-support, of a presser-plate, a 45 hook having oppositely-arranged shoulders, means for reciprocating the hook through

and along the work, a thread-presenting plate, a carrier on which said plate is mounted, means for moving the carrier toward and away from the hook, means for reciprocating 50 the thread-presenting plate with respect to the carrier whereby the thread-presenting plate is carried from one side of the path of the hook to the other and rearwardly with respect to said path, a looper, and actuating 55 means therefor, substantially as described.

26. In a sewing-machine, the combination with a work-support, of a presser-plate, a hook having oppositely-arranged shoulders mounted in the work-support, means for re- 60 ciprocating the hook through and along the work, a thread-presenting plate, a slide on which said plate is mounted, a bar for supporting said slide, means for reciprocating the slide with respect to the bar, means for 65 moving the bar toward and away from the work, a looper, and means for actuating the looper, substantially as described.

27. In a sewing-machine, the combination with a work-support, of means for moving it into and out of operative position, a presser- 70 plate, a slide mounted in the work-support, a series of blocks secured to the slide, a series of hooks held by the blocks, a second slide with which the hooks are in engagement, means 75 for giving the slides reciprocations at an angle to each other whereby the hooks are carried through and along the work, a bar, a series of thread-presenting devices, a slide mounted in the bar, means for reciprocating 80 said slide with respect to the bar, means for moving the bar toward and away from the work, a series of loopers, and actuating devices therefor, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 85 witnesses.

JOHN R. REYNOLDS.

Witnesses:

C. C. KIMBALL,
FRED W. KAESER.