

J. WEIR.
OVERSEAMING SEWING MACHINE.

(Application filed Apr. 30, 1900.)

(No Model.)

6 Sheets—Sheet 1.

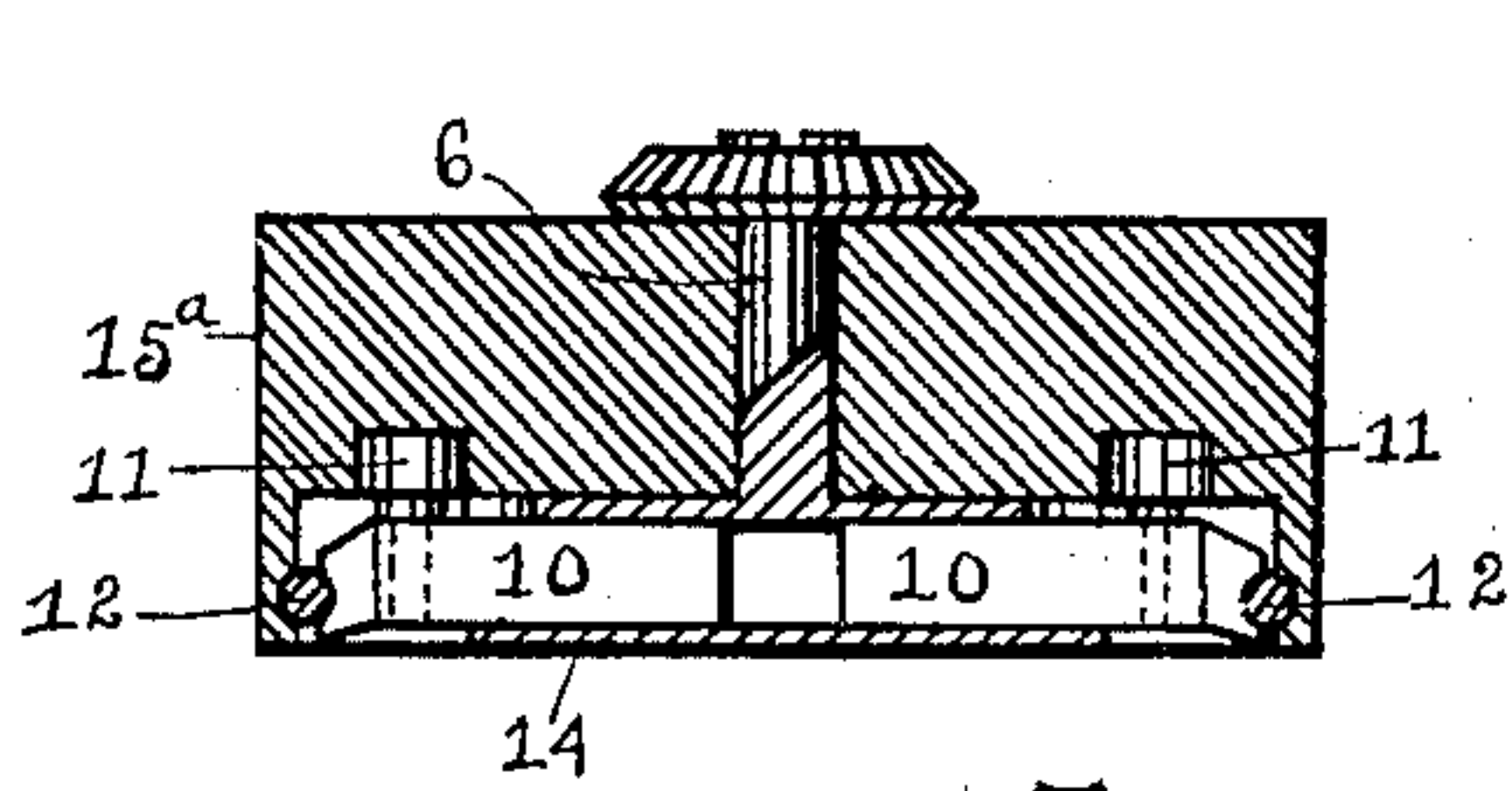


Fig. 7.

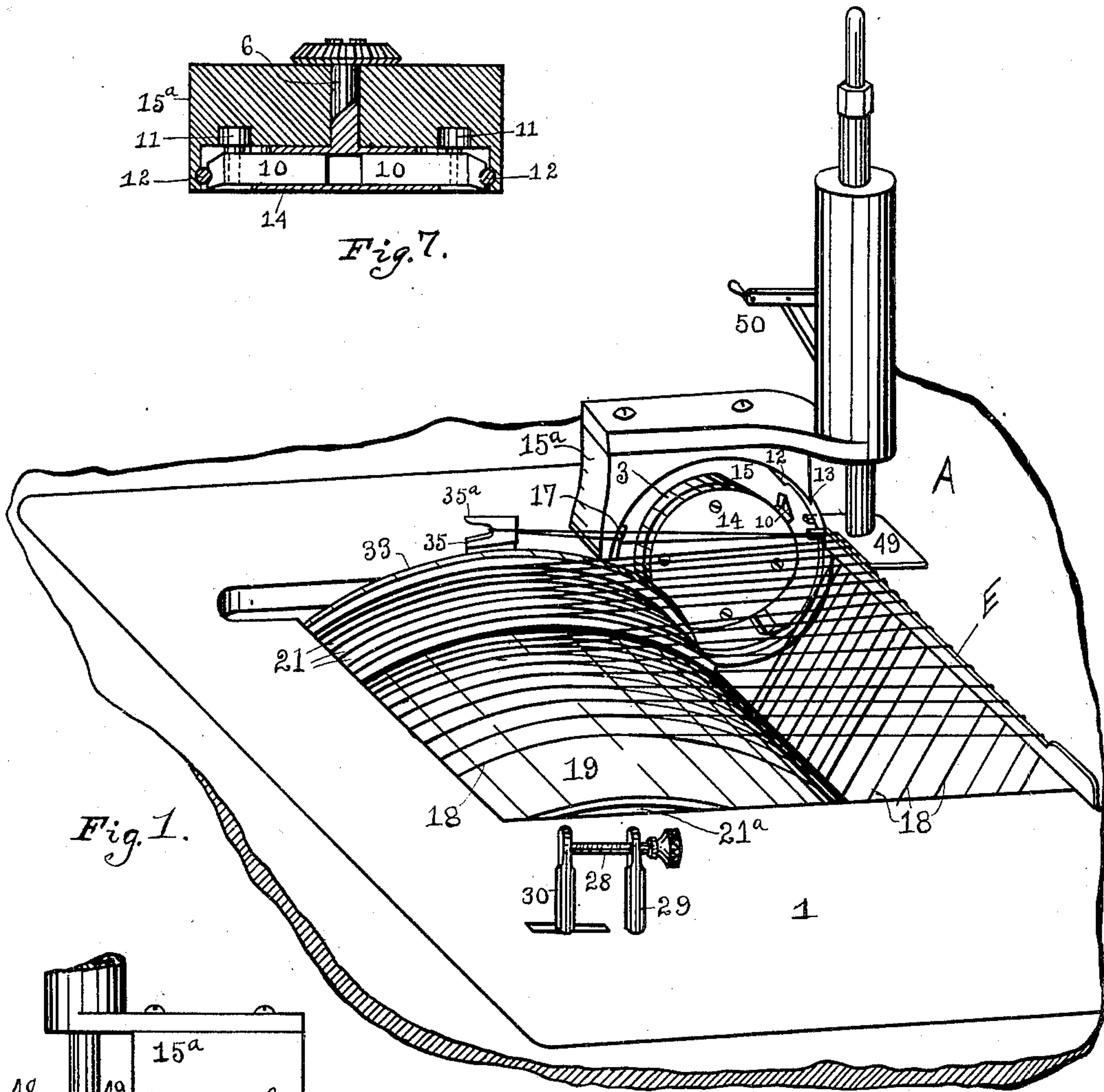


Fig. 1.

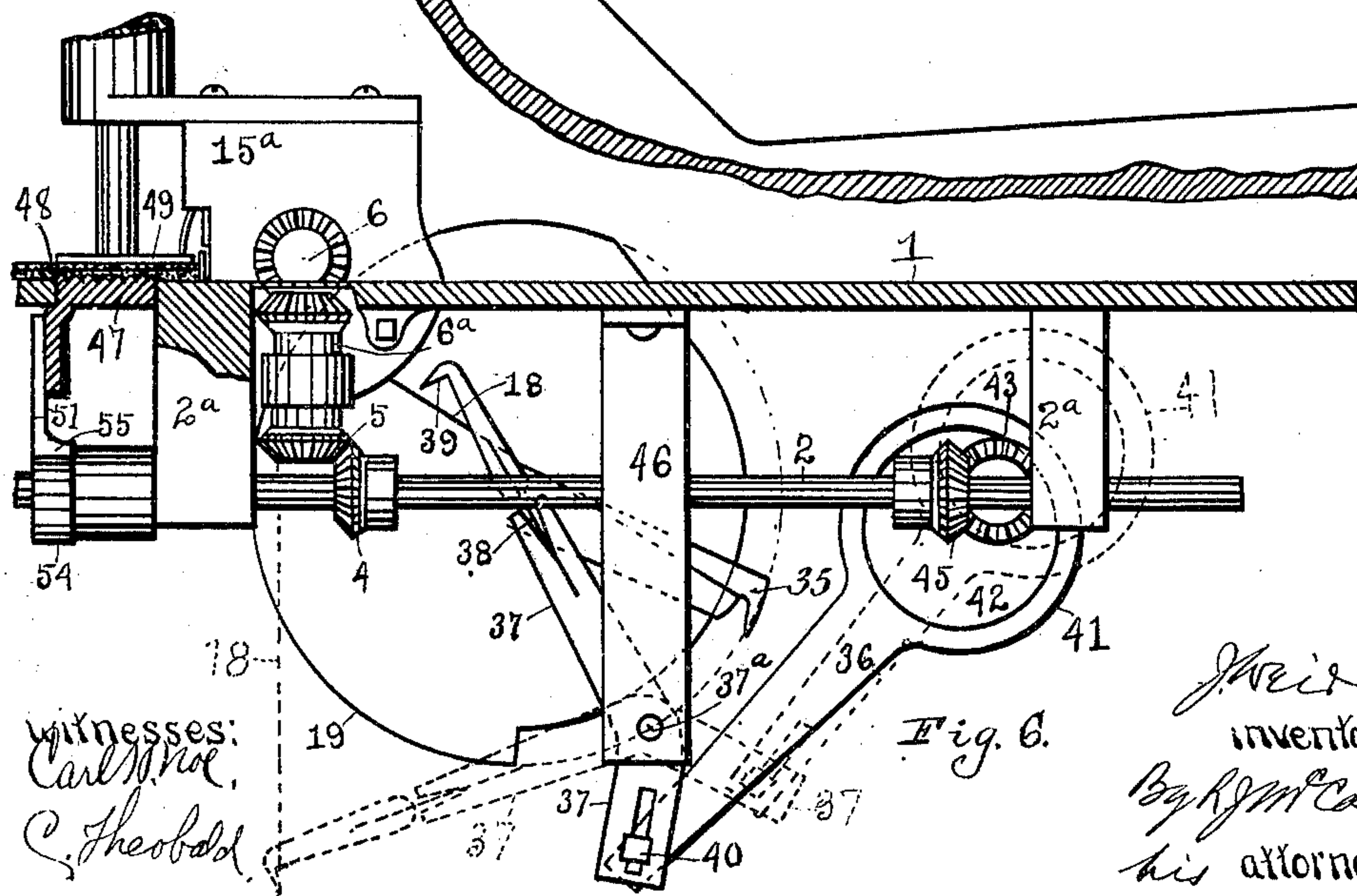


Fig. 6.

Witnesses:
Carl H. Noel,
C. Theobald.

J. Weir
inventor.
By R. M. Carly,
his attorney.

No. 672,467.

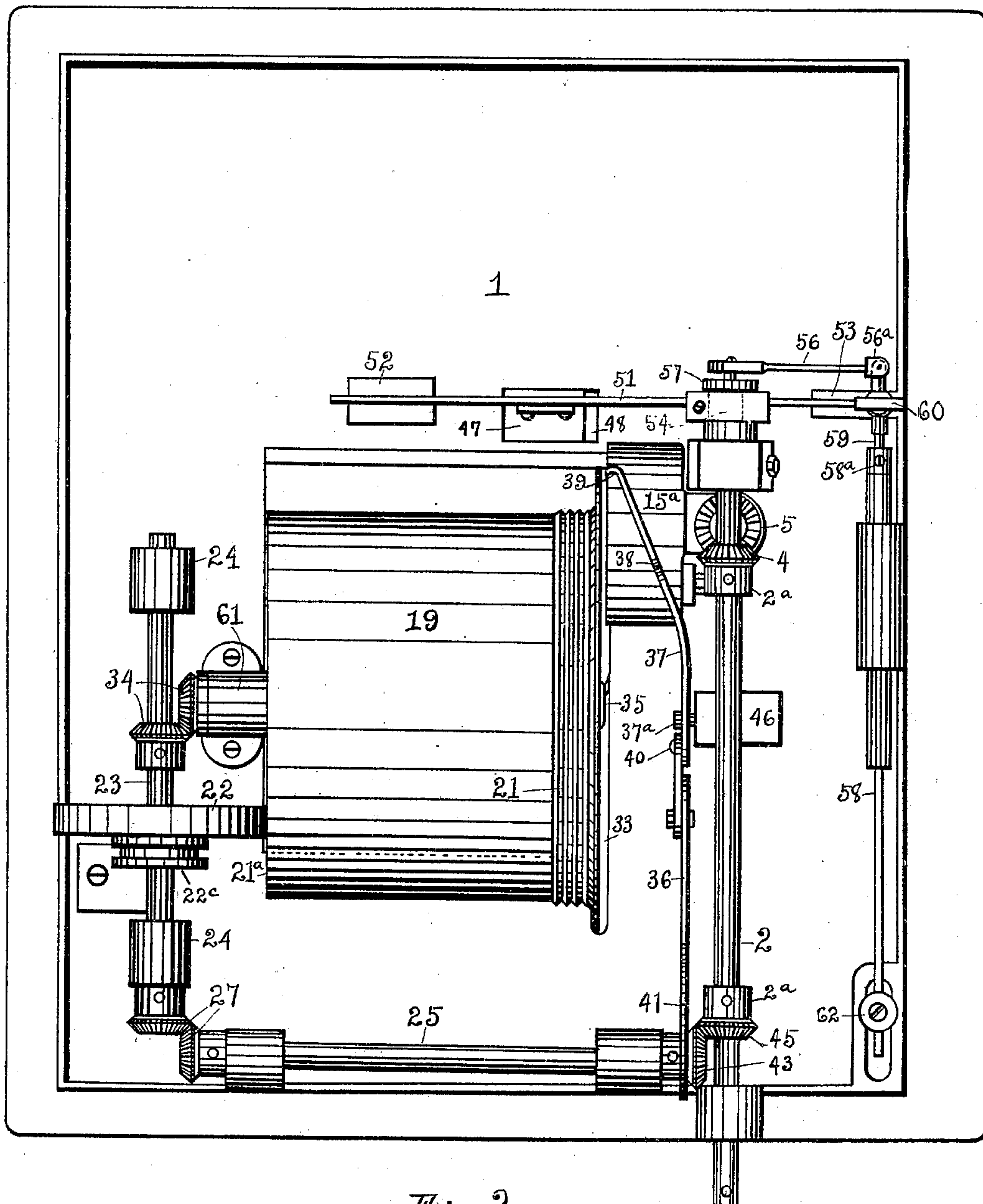
Patented Apr. 23, 1901.

J. WEIR.
OVERSEAMING SEWING MACHINE.

(Application filed Apr. 30, 1900.)

(No Model.)

6 Sheets—Sheet 2.



No. 672,467.

Patented Apr. 23, 1901.

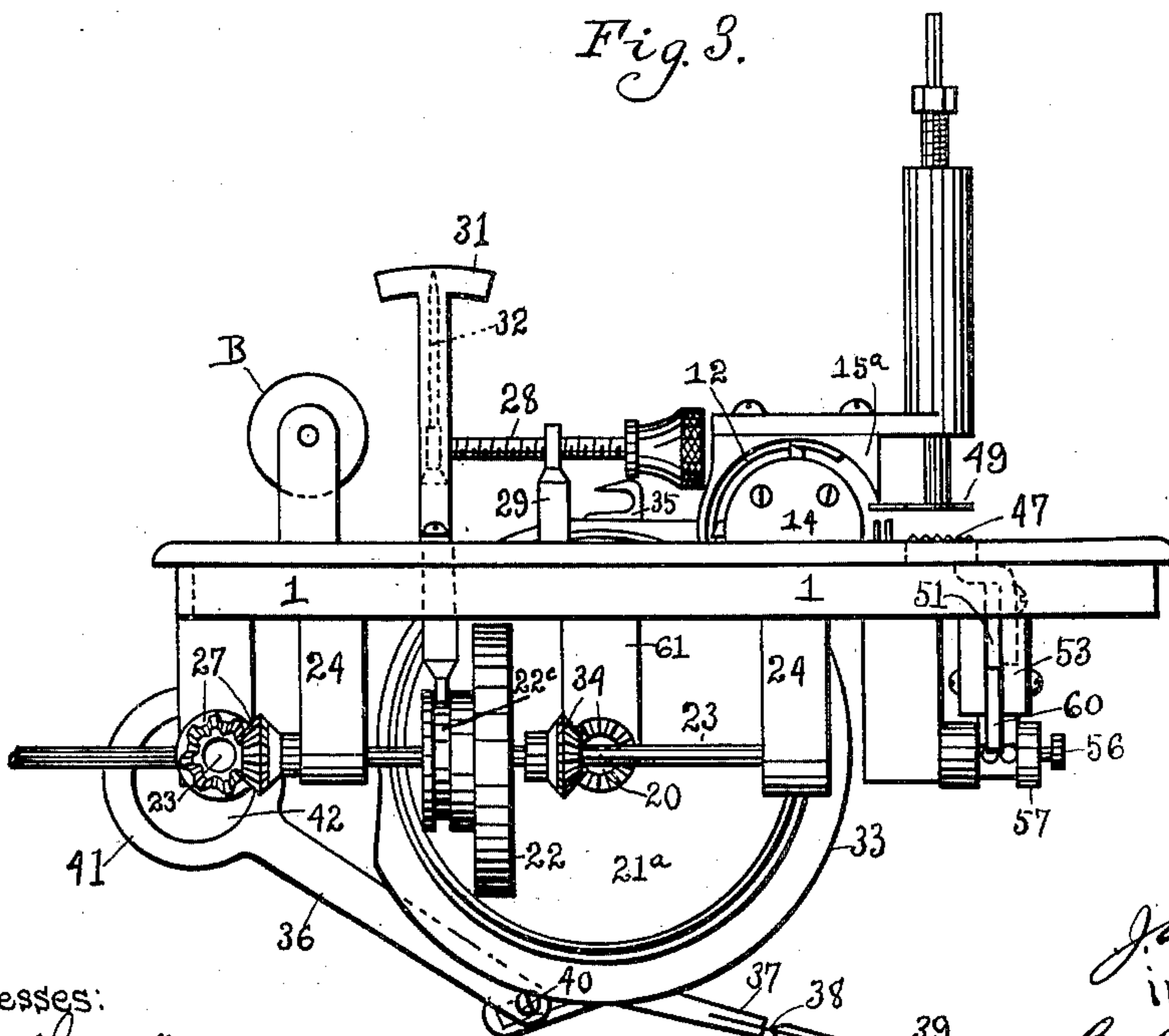
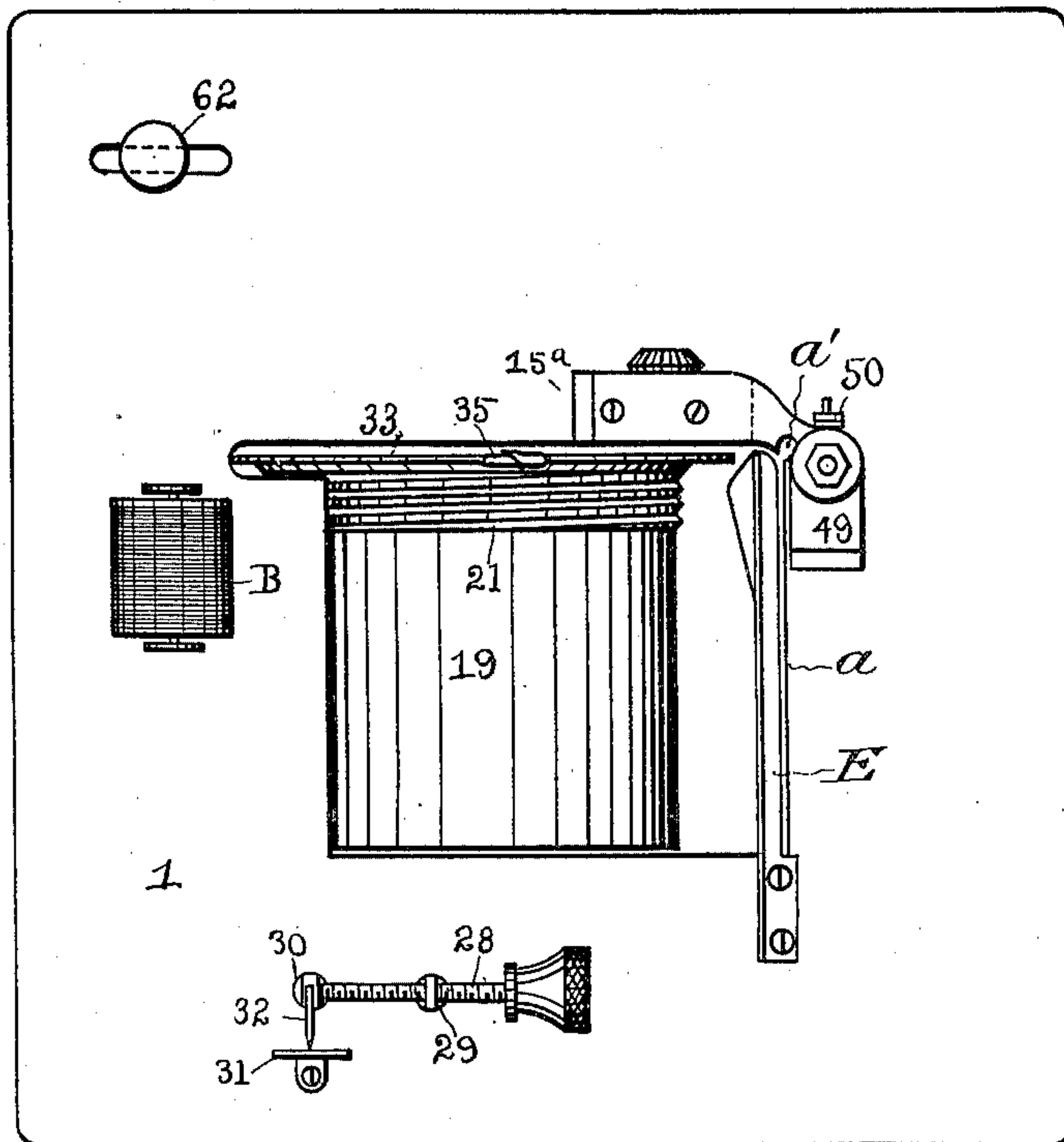
J. WEIR.

OVERSEAMING SEWING MACHINE.

(Application filed Apr. 30, 1900.)

(No Model.)

6 Sheets—Sheet 3.



Witnesses:

C. Theobald.
Carl H. Nor

Jewett
inventor.
By R. J. M. Canty
his attorney.

No. 672,467.

Patented Apr. 23, 1901.

J. WEIR.

OVERSEAMING SEWING MACHINE.

(Application filed Apr. 30, 1900.)

(No Model.)

6 Sheets—Sheet 4.

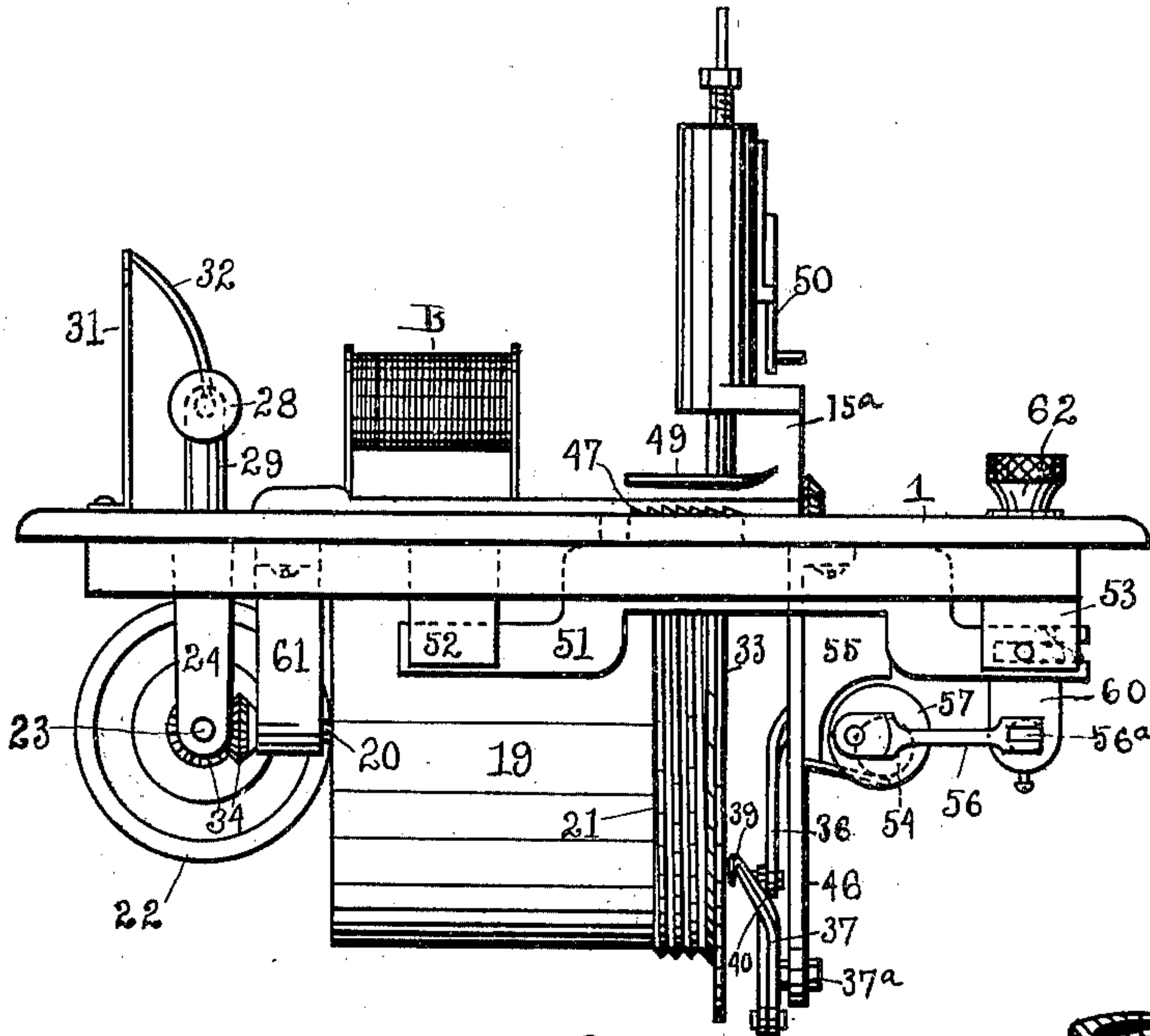


Fig. 9.

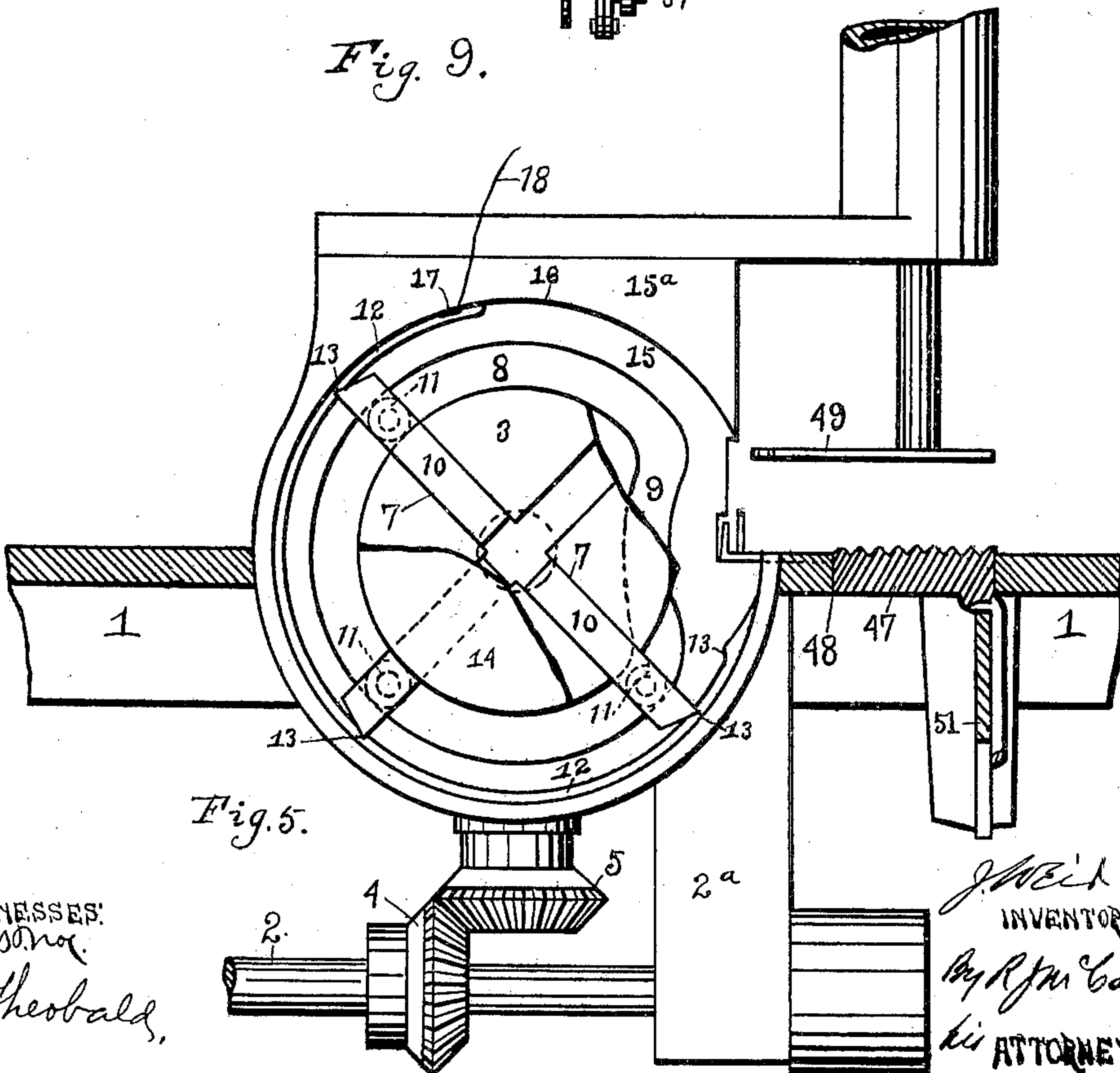


Fig. 5.

WITNESSES:
Carlson,
C. Theobald,

J. Weir
INVENTOR.
By R. J. M. Gault,
ATTORNEY.

No. 672,467.

Patented Apr. 23, 1901.

J. WEIR.

OVERSEAMING SEWING MACHINE.

(Application filed Apr. 30, 1900.)

(No Model.)

6 Sheets—Sheet 5.

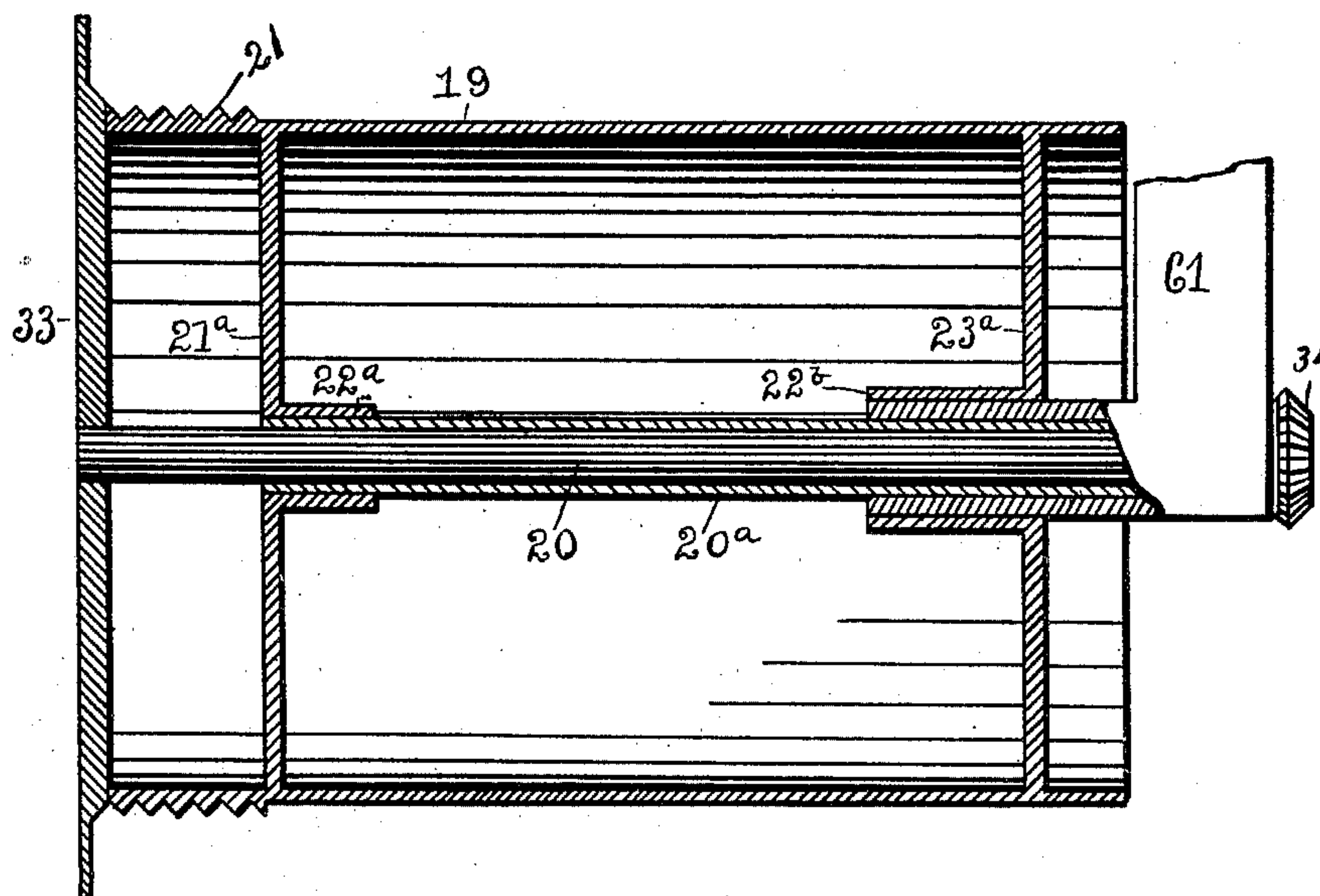


Fig. 8

Witnesses:

Carl M. W.

C. Theobald.

J. Weir.

inventor.

By J. M. Caste
his attorney.

No. 672,467.

Patented Apr. 23, 1901.

J. WEIR.

OVERSEAMING SEWING MACHINE.

(Application filed Apr. 30, 1900.)

(No Model.)

6 Sheets--Sheet 6.

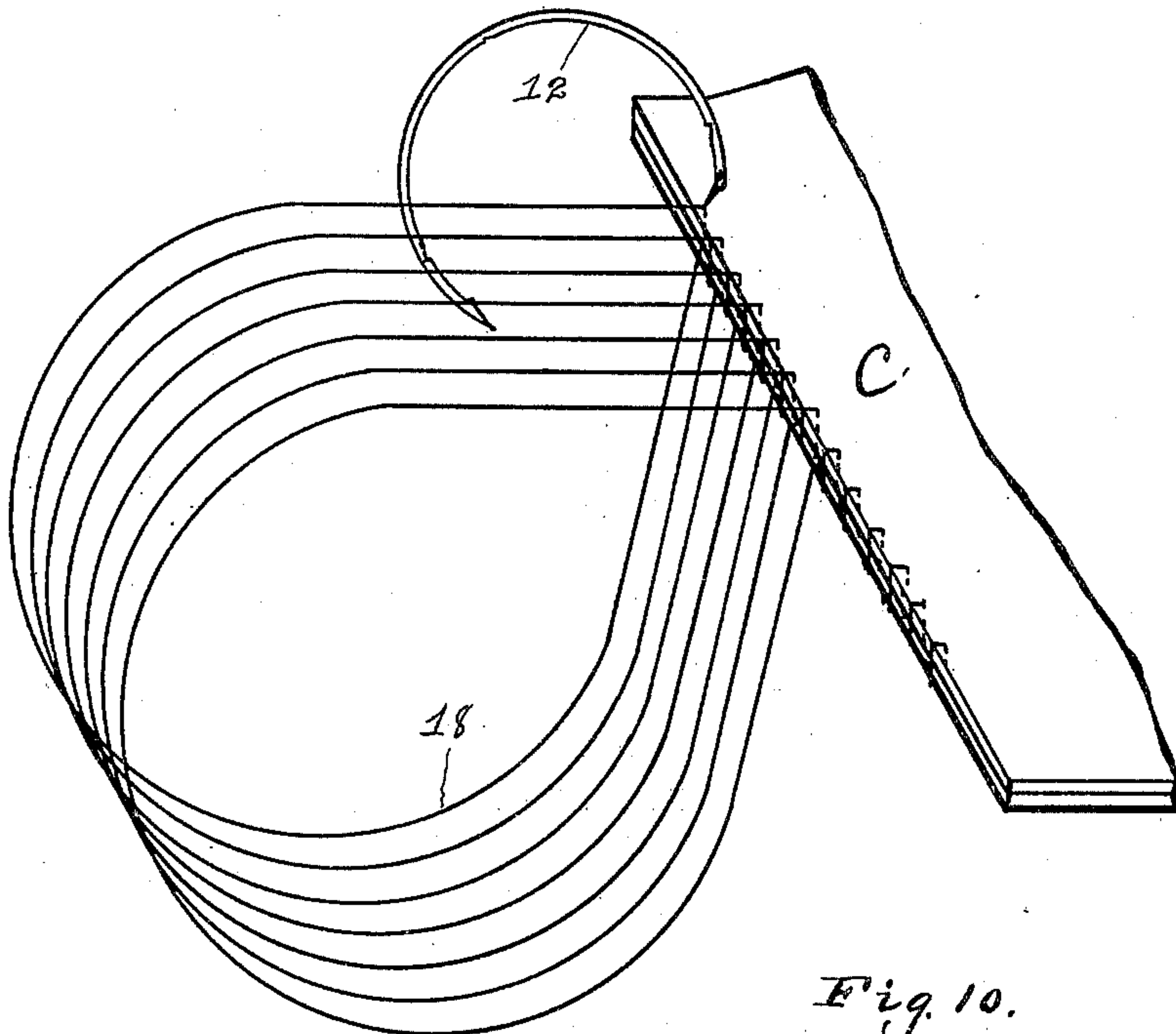


Fig. 10.

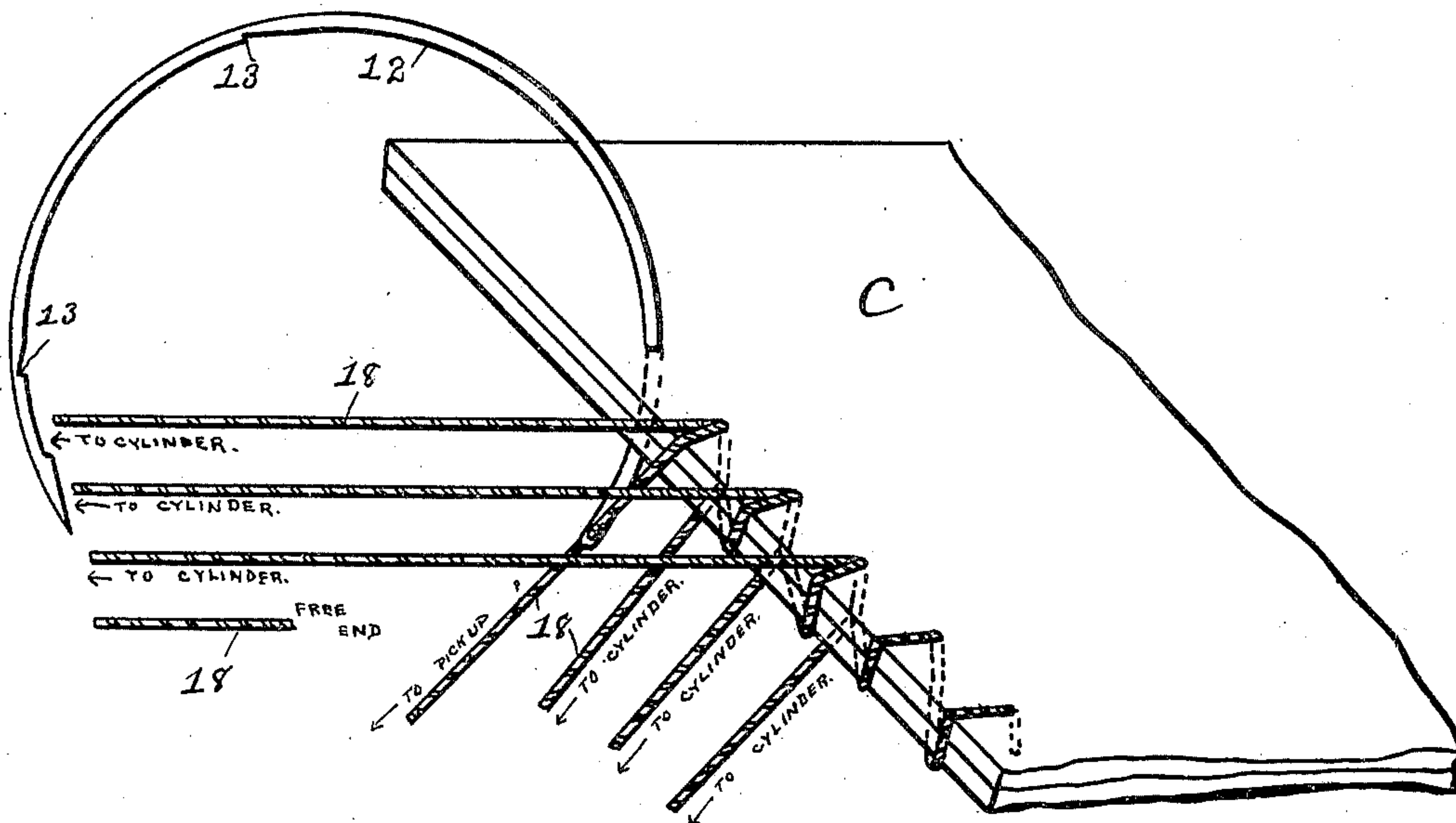


Fig. 11.

WITNESSES:

Carlton.

C. Theobald.

J. Weir.
INVENTOR.

By R. J. M. Carty
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN WEIR, OF DAYTON, OHIO, ASSIGNOR OF ONE-HALF TO DENNIS DWYER, OF SAME PLACE.

OVERSEAMING SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 672,467, dated April 23, 1901.

Application filed April 30, 1900. Serial No. 14,819. (No model.)

To all whom it may concern:

Be it known that I, JOHN WEIR, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Sewing-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in sewing-machines, and has special reference to an over stitch sewing-machine.

The object of the invention is to provide mechanism adapted to sew carpets or other material where two edges are brought together.

In broad terms, the invention comprises a circular needle and means for driving said circular needle and comprises also means for controlling the thread, all as will be hereinafter fully described.

In a detail description of the invention, Figure 1 is a perspective view of the mechanism. The dial is removed from this view. Fig. 2 is a plan view of the underside of the mechanism. Fig. 3 is a top plan view. Fig. 4 is an end elevation. Fig. 5 is an elevation of the needle-case and actuating mechanism for said needle. Fig. 6 is a sectional view showing the tension devices. Fig. 7 is a horizontal sectional view through the needle and the needle-driving mechanism. Fig. 8 is a horizontal section through the thread-cylinder; Fig. 9, a side elevation of the machine. Fig. 10 is a perspective view showing an edge of the fabric and the formation of the stitches. The thread-cylinder is removed from this view. Fig. 11 is a perspective view of an edge of the fabric, showing the formation of the stitches.

In a detailed description of the invention similar reference characters will indicate corresponding parts of the mechanism, as shown in the drawings.

1 designates a metallic base-plate which affords a support of the various mechanism. This plate is suitably mounted on the usual

sewing-machine table or frame, which is not shown in the drawings.

2 designates the main driving-shaft, mounted in hangers 2^a, and by which rotary motion is conveyed to a needle-driver 3 through miter-gears 4 and 5, the latter gear being fast on the end of shaft 6^a, which is geared to shaft 6, fixed at its inner end to the needle-driver 3. Said needle-driver has three or more radial slots 7 extending from the axis to the periphery thereof. It also has a circular slot 8, one portion 9 of which provides a cam-surface which controls dogs 10. Said dogs 10 are mounted in the radial slots 7, and each is provided with a roller 11, which travels in the grooves 8 and 9. From Fig. 5 it will be seen that the dogs are held in outward positions to drive the circular needle 12 and that each of said dogs releases its engagement with the needle when the cam portion 9 of the groove is reached. The needle is provided with a series of notches 13, with which the dogs engage to drive it, and each dog moves away from its respective notch 13 just before each notch arrives at the material.

14 is a plate which incloses the dogs and maintains them in position in the slots 7, said plate being screwed onto the needle-driver 3. The said driver is mounted in the recess 15 in a stationary plate or upright bracket 15^a. The needle 12 moves against the inner surface 16, which surrounds the recess 15. Bracket 15^a also provides a bearing for the shaft 6, which drives the needle-driver 3. The needle 12 has an eye 17 in its rear end, which receives the thread 18.

19 designates a rotating cylinder for the thread 18, which surrounds it, as shown in Fig. 1. This cylinder has a plurality of grooves 21, in which the thread is fed in suitable length. Said cylinder 19 is driven by a friction-wheel 22, which is in contact with the end 21^a thereof. Friction-roller 22 is mounted on a shaft 23, journaled in the hangers 24 and lying parallel with the main driving-shaft 2, to which it is geared through means of a right-angled shaft 25, which is driven from shaft 2 by miter-gears 43 and 45. Miter-gears 27 transmit motion to shaft 23. (See Fig. 2.) The speed of the cylinder 19 is regulated according to the position that the friction-wheel 22 occu-

pies with reference to the axis of said cylinder. Means for varying the relative position of the friction-wheel 22 with the axis of the cylinder 19 are shown in Figs. 4 and 9 and consist of a screw 28, which is mounted in a stationary post 29 and has a screw-threaded engagement with an upright bar 30, the lower end of which clutches the grooved hub 22^c of the friction-wheel 22. A definitely-ascertained movement of the bar 30 is enabled by means of a stationary dial 31. A finger 32, projects from said bar 30 and points to the degrees of graduation that are shown on said dial 31. Referring to Figs. 1 and 3, the needle passes through the opening *a'*, over which the fabric C, Figs. 10 and 11, is fed. The said fabric is guided along the guide-bar E. As the operation of the machine continues the strands of thread extending from the fabric to the cylinder 19 pass through the opening *a* in the plate 1 and over the guide-bar E. The opening *a* lies along the outer edge of the guide-bar. The thread-cylinder 19 and the guide-bar E thus serve as a thread-supply controller. The importance of this nicety of adjustment of the cylinder 19 will hereinafter appear.

33 designates a disk adjacent to one end of the cylinder 19 and is movable with said cylinder, but not at the same rate of speed. 20^a is a sleeve which loosely incloses shaft 20 and forms a shaft for the cylinder 19. This tubular shaft 20^a is journaled in bearings 22^a and 22^b, which project from the walls or plates 21^a and 23^a, which are inclosed in the cylinder and are attached to said cylinder 19, so that the cylinder rotates on the tubular shaft 20^a or with said tubular shaft independent of shaft 20. (See Fig. 8.) A hanger 61 projects into the bearing 22^b and forms a bearing for one end of shaft 20. The other end of shaft 20 is secured to the disk 33.

Shaft 20 is geared to shaft 23 by miter-gears 34 and is constantly driven from the shaft 2 to move the disk 33. Disk 33 has a rigid hook or pick-up 35 fixed to it, which engages the thread to direct it onto the cylinder 19 just as the point of the needle passes each time through the goods or material A, as is clearly shown in Fig. 1. It is therefore important that the pick-up 35 should engage the thread at the proper time, which is just as the eye of the needle passes below the nose 35^a of the pick-up.

The difference in the ratio of speed between the disk 33 and the cylinder 19 is one and one-fifth of a rotation of the latter to one rotation of the former. This increase in the speed of the cylinder is essential in order that there shall be sufficient loose thread to supply the needle.

A tension device for controlling the slack in the thread prior to the engagement of the pick-up 35 therewith consists of pivotal arms 36 and 37, the latter of which has an angular form, as shown in Figs. 4 and 6. Arm 37 has also a spring or yielding connection 38 be-

tween its two members and a hook 39, which engages with the thread in its lower movement to take up the slack. Arm 36 has a sliding connection with arm 37 to allow the pivot 40 to change its position in the movement of said arms. Movement is imparted to arm 36, which terminates in a strap 41, which surrounds an eccentric 42. Said eccentric 42 is rotated by the beveled pinion 43, which drives shaft 25, pinion 43 being driven by a similar pinion 45 on shaft 2. Arm 37 has a pivotal connection 37^a on one side of the pivot 40 to a hanger 46. The extent of the movement imparted to this tension device by the eccentric 42 is illustrated in Fig. 6. The arm 37 yields upwardly during the period in which the stitch is being made and then moves downwardly to take up the thread as the needle rotates to make the next succeeding stitch, the dotted position of the arm 37 being that in which the slack in the thread is taken up. The rate of speed given the disk 33 is regulated to bring the pick-up 35 at the proper point to take one strand of the thread from the needle and direct it onto the cylinder, as shown in Fig. 1.

The fabric-feeding mechanism does not constitute any part of the present invention; but the same will be described as follows:

47 designates a serrated plate which projects through an opening 48.

49 is a pressure-foot which is raised and lowered by levers 50 in the usual manner.

The serrated plate 47 has a connection with an angular bar 51, which is mounted to slide in slotted hangers 52 and 53.

54 is an eccentric or cam which makes contact with an extension 55, which projects down from the bar 51 and by means of which said bar is raised or lowered. At the same time the bar 51 is raised or lowered it is also given a longitudinal reciprocating movement by means of a connecting-rod 56, which has an eccentric connection with a head 57 on the end of the cam or eccentric 54. The connecting-rod 56 has a flexible connection 56^a with a short shaft 59, which has a flexible connection 58^a with a feed-regulating rod 58, (see Fig. 2,) so that in the movement of the connecting-rod 56 the short shaft 59 will have the necessary movement. The rod 59 being mounted in an extension 60, that projects from an end of the reciprocating bar 51, will give said bar 51 the necessary longitudinal movement. The eccentric 54 is mounted on the horizontal shaft 2, which drives the tension-arms 36 and 37 through pinions 43 and 45.

The feed or movement of the serrated feed-plate 47 is regulated through adjusting-screw 62, which connects with rod 58.

The function of the pick-up 35 is to dispose of the thread as each stitch is being formed. As the eye of the needle reaches its outermost position relative to the fabric the nose 35^a of the pick-up enters the loop in the thread carried by the needle, and in the continued rotation of the pick-up one strand of the thread

forming said loop is delivered to the cylinder 19 and the other strand of the thread is carried down by said pick-up across the face of the disk 33. (See Figs. 1 and 6.) The tension device 39 engages the thread thus being carried across the face of the disk, and moving downwardly to the position shown in broken lines in Fig. 6 said device applies tension to the thread and draws it down and out of engagement with the pick-up. The thread is thus controlled by the tension device until the thread held thereby is utilized for the next succeeding stitch. At this time the tension device 39 moves up to the position shown in full lines and releases the thread, which is drawn through the fabric by the needle in forming each succeeding stitch. The machine is operated to sew the fabric as soon as the needle is threaded, and as the sewing proceeds the cylinder is filled with supply-thread, and the thread is severed from the spool B when sufficient thread has been stored on the cylinder.

The operation of the machine is as follows:
 25 The machine is put in condition for work by threading the needle from spool B and knotting the end of the thread to prevent its being drawn through the fabric. The fabric is then placed in position over the opening a' , with its edge against the guide-bar E. Upon the first penetration of the fabric by the needle a loop of thread is drawn therethrough, and when the eye of the needle has reached its outermost position relative to the fabric the pick-up 35 enters the loop and continues to draw thread out into loop form, as shown in Fig. 1; but as the end of the thread that is knotted cannot give up the thread, thread is drawn from the spool, the thread reeving through the fabric and about the pick-up. Upon continued movement of the pick-up the strands of the loop are separated, one of them being placed upon the cylinder 19, while the other is passed over the face of the disk 33, and the cylinder, through its rotation and the friction of the thread on the same, continues to draw thread from the supply. The cylinder gives off thread on the lower side thereof as fast as it is taking on thread on the upper side, and therefore slack thread will be formed on the under side of the cylinder between the same and the fabric. This slack is controlled by the tension device 39 and is taken up by the needle passing a second time through the fabric and forming a new loop, which is also taken up by the pick-up and placed on the cylinder. The cylinder therefore takes up the slack as each new loop is placed thereon that was given up by the cylinder from the previously-formed loop. After the pick-up enters the loop of thread the needle-eye slides along the thread, held taut between the pick-up and the fabric until it is in close proximity to the fabric, so that when the needle draws the next loop through the fabric the part of the thread previously between the needle-eye and the preceding stitch is drawn around the

edge of the fabric and drawn tight, thereby completing the stitch. It remains, however, for the other strand of the loop of thread running back to the supply to be drawn from the needle-hole of the completed stitch. This is accomplished by the following means: The cylinder in its rotation is drawing thread from the supply, and if the thread be severed from the spool it is apparent that the loose end (seen in Fig. 11) will be drawn from the needle-hole first made, and so on through each succeeding needle-hole, the end of the thread passing from a needle-hole at each revolution of the cylinder.

In order that sufficient thread may be given up to form the stitches, the cylinder is rotated at a greater speed than the disk carrying the pick-up, the speed of the cylinder representing the amount of thread given up and the speed of the disk representing the amount of thread taken up again—that is to say, the pick-up carried by the disk, instead of rotating at the same speed as the cylinder, which would place as much thread thereon as is given off, lags behind the cylinder, and thus places the thread one-fifth of the circumference, or thereabout, back of the position of the pick-up relative to the cylinder on the previous rotation, and a length of thread equal to this distance is therefore given up at each rotation of the cylinder.

Having described my invention, I claim—

1. In a sewing-machine, the combination of a circular needle, passing entirely through a fabric and carrying the thread with it, mechanism for driving said needle, a thread-cylinder, a pick-up, and mechanism for driving said cylinder and pick-up at variable speed, substantially as specified.

2. In a sewing-machine, the combination of a circular needle, passing entirely through a fabric and carrying the thread with it, mechanism for driving said needle, a cylinder from which the thread is fed to said needle, and a pick-up which takes one strand of the loop of thread formed by the needle as each stitch is made and delivers said strand to the cylinder, and means for driving said cylinder and pick-up, substantially as specified.

3. In a sewing-machine, the combination of a circular needle, passing entirely through a fabric and carrying the thread with it, mechanism for driving said needle, a thread-cylinder which feeds the needle for each stitch and receives the loose strand of thread after the completion of each stitch, mechanism for driving the cylinder and pick-up at different speeds, and mechanism for feeding material to said needle, substantially as specified.

4. In a sewing-machine, the combination of a circular needle, mechanism for driving said needle, a thread-cylinder from which the needle is fed and which receives the loose strand of the loop of thread formed by said needle after the completion of each stitch, a pick-up which delivers the loose thread to said cylinder and means for driving said cyl-

inder and pick-up, and mechanism for applying tension to the loose thread between the needle and the cylinder after the completion of each stitch, substantially as described.

5 5. In a sewing-machine, the combination of a circular needle, means for driving said needle, a thread-cylinder from which the needle is supplied with thread and which receives the loose strand of the loop of thread formed

10 by the needle after the completion of each stitch, a pick-up which delivers said loose strand of thread to the cylinder, said cylinder and said pick-up being rotatable at different speed and means for driving said cylinder

15 and pick-up, means for changing the speed of the cylinder, and tension devices for taking up the slack in the thread between the cylinder and the needle after the completion of each stitch, substantially as described.

20 6. In a sewing-machine, the combination of a circular needle, mechanism for driving said needle, a thread-cylinder from which the needle is fed and which receives the loose strand of thread after each stitch, an adjustable friction-wheel for driving said cylinder,

25 a pick-up which delivers the loose strand of thread to said cylinder after each stitch, means for actuating said pick-up and a tension device for controlling the slack thread

30 between the cylinder and the needle, substantially as described.

7. In a sewing-machine, the combination of a circular needle, mechanism for driving said needle, a thread-cylinder from which the needle is fed and which receives the loose strand

35 of thread after each stitch is made, a pick-up which draws the loose strand of thread through the goods and delivers it to the cylinder, means for actuating said pick-up, a

40 friction-driver for said cylinder, means for adjusting said friction-driver to regulate the speed of the thread-cylinder, and tension devices for controlling the slack in the thread between the cylinder and needle, substantially

45 as described.

8. In an over stitch sewing-machine, the combination with a rotary needle adapted to pierce a fabric and to draw a loop of thread therethrough to a point where the eye of the needle reaches its outermost position relative

50 to said fabric, of a thread-cylinder adapted to deliver the thread to said needle for the formation of each stitch and to receive back from said needle the loose strand of said thread after the formation of each stitch, and a pick-

55 up engaging with the loop of thread carried by the needle and delivering the loose strand of said loop to the cylinder and means for driving said cylinder and pick-up as set forth.

9. In a sewing-machine the combination

60 with a rotary needle adapted to penetrate a fabric and to draw a loop of thread therethrough, of a thread-cylinder from which the needle is supplied and which receives thread from said needle during the formation of each

65 stitch, a pick-up for engaging the loop of thread drawn by the needle and delivering the loose strand thereof to the thread-cylinder, means for driving said cylinder and pick-

70 up and means for engaging the strand of thread between the pick-up and needle.

10. In a sewing-machine, the combination of a rotary thread-cylinder, a circular needle adapted to penetrate a fabric and to draw therethrough a loop of thread, means for driving

75 said needle, a pick-up adapted to engage said loop of thread at or near the outermost position of the eye of the needle relative to the fabric, and to deliver the loose strand of said

80 loop to the cylinder, means for driving said cylinder and pick-up and a tension device adapted to engage the strand of thread between the pick-up and the needle.

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

JOHN WEIR.

Witnesses:

DENNIS DWYER,
R. J. MCCARTY.