

No. 621,170.

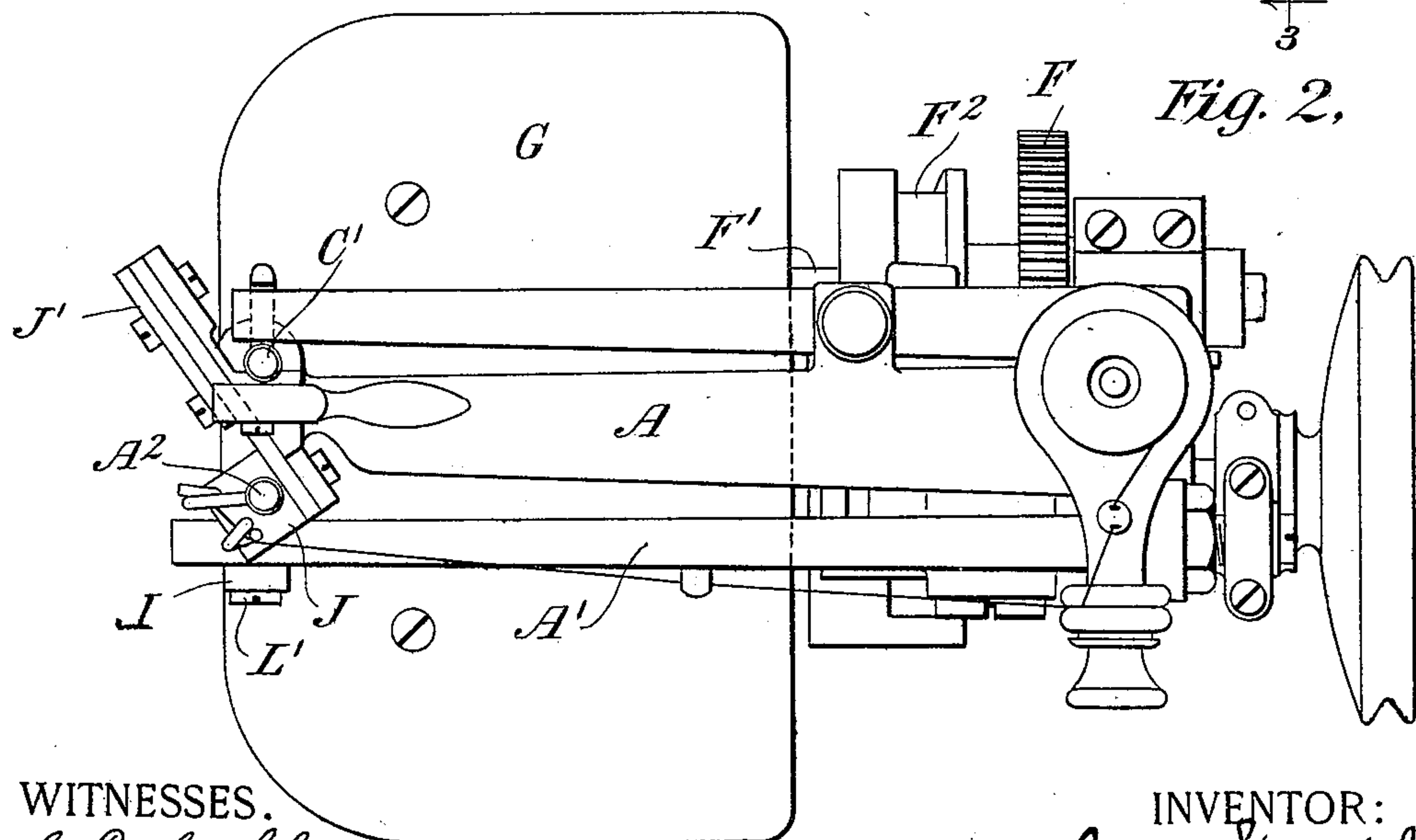
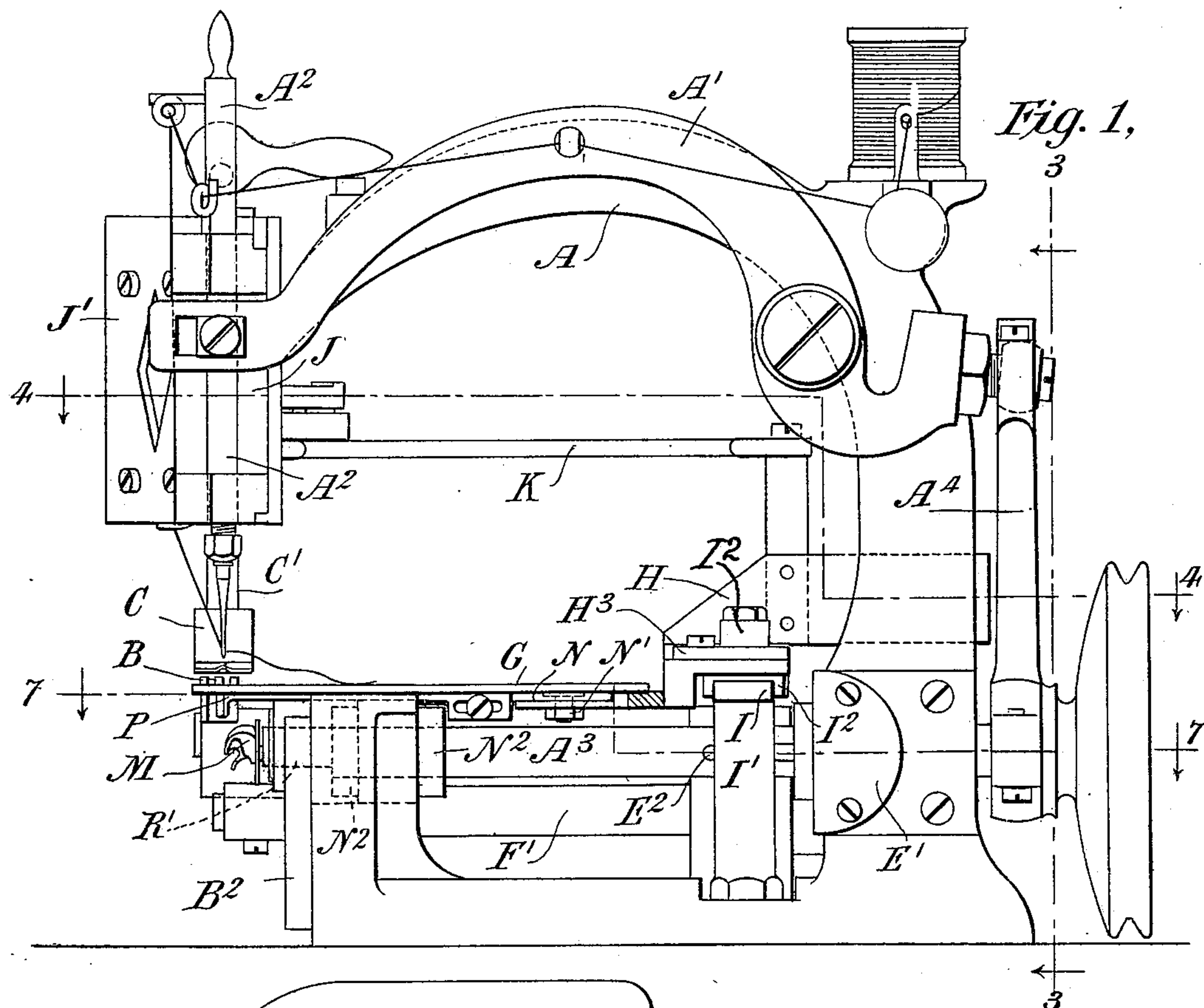
Patented Mar. 14, 1899.

J. STEWART, JR.
SEWING MACHINE.

(Application filed Aug. 26, 1897.)

(No Model.)

6 Sheets—Sheet 1.



WITNESSES.

C. E. Ashley
H. W. Lloyd

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By his Attorneys
Paldwin Davidson Wright.

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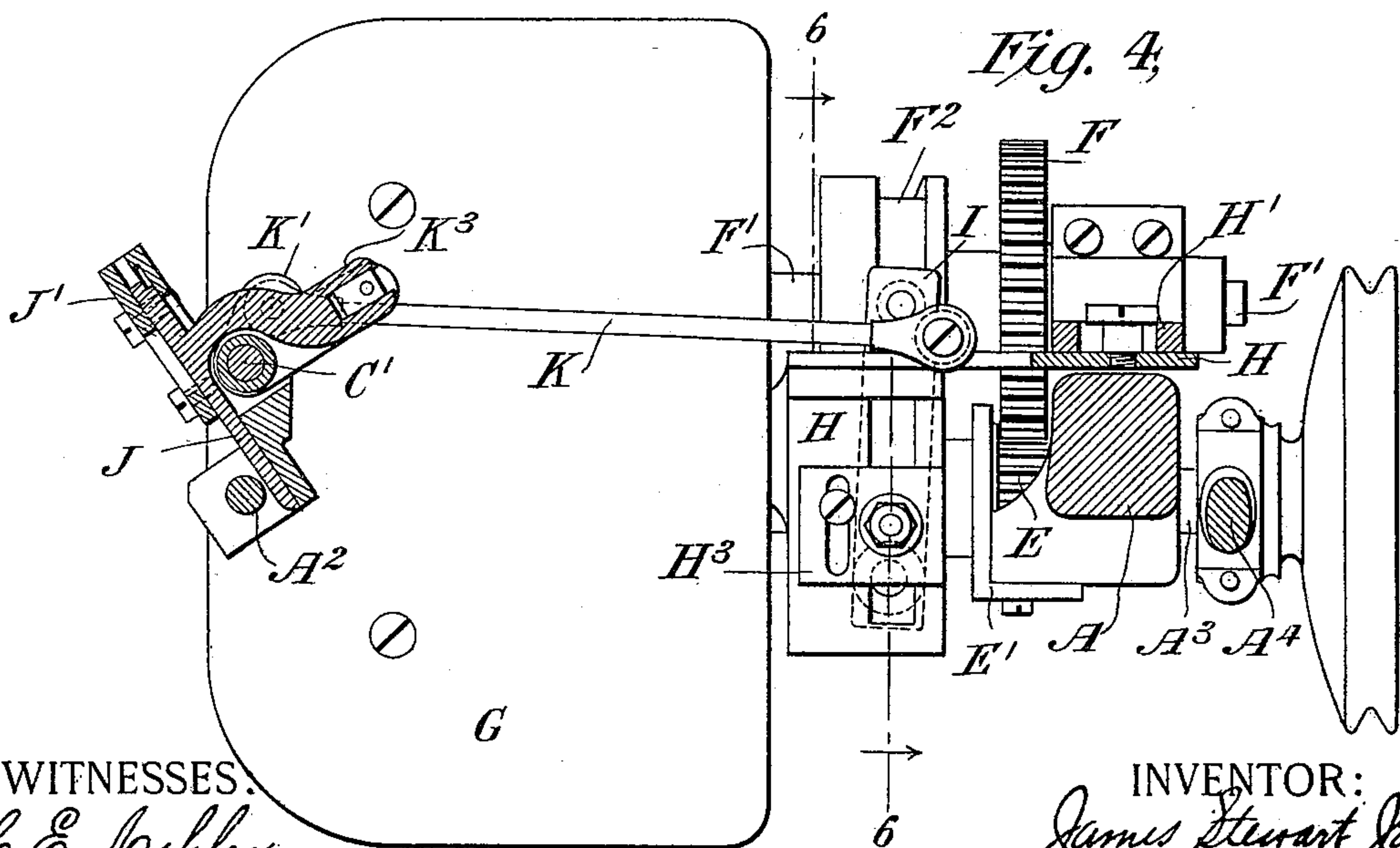
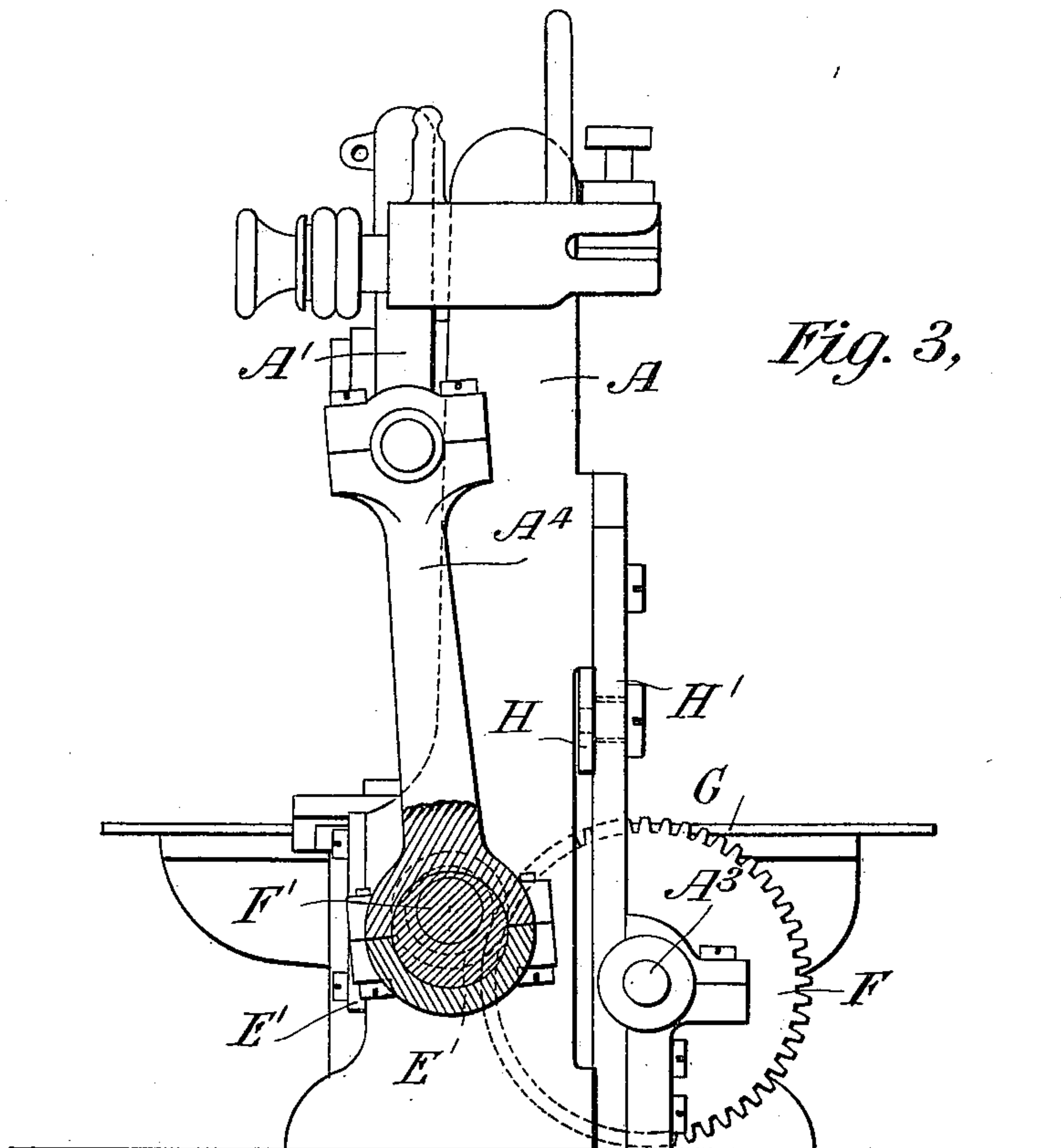
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6 Sheets—Sheet 2.



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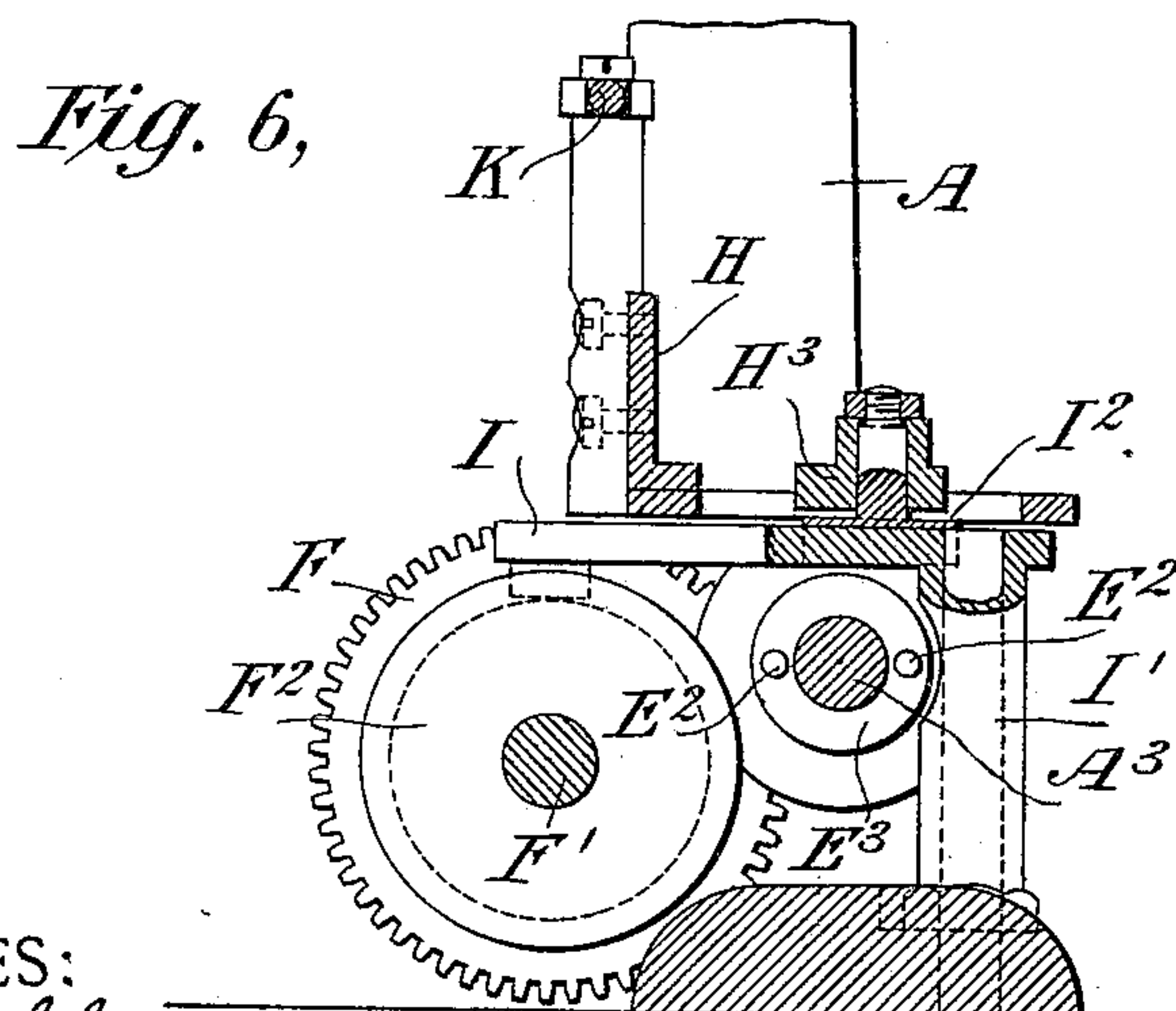
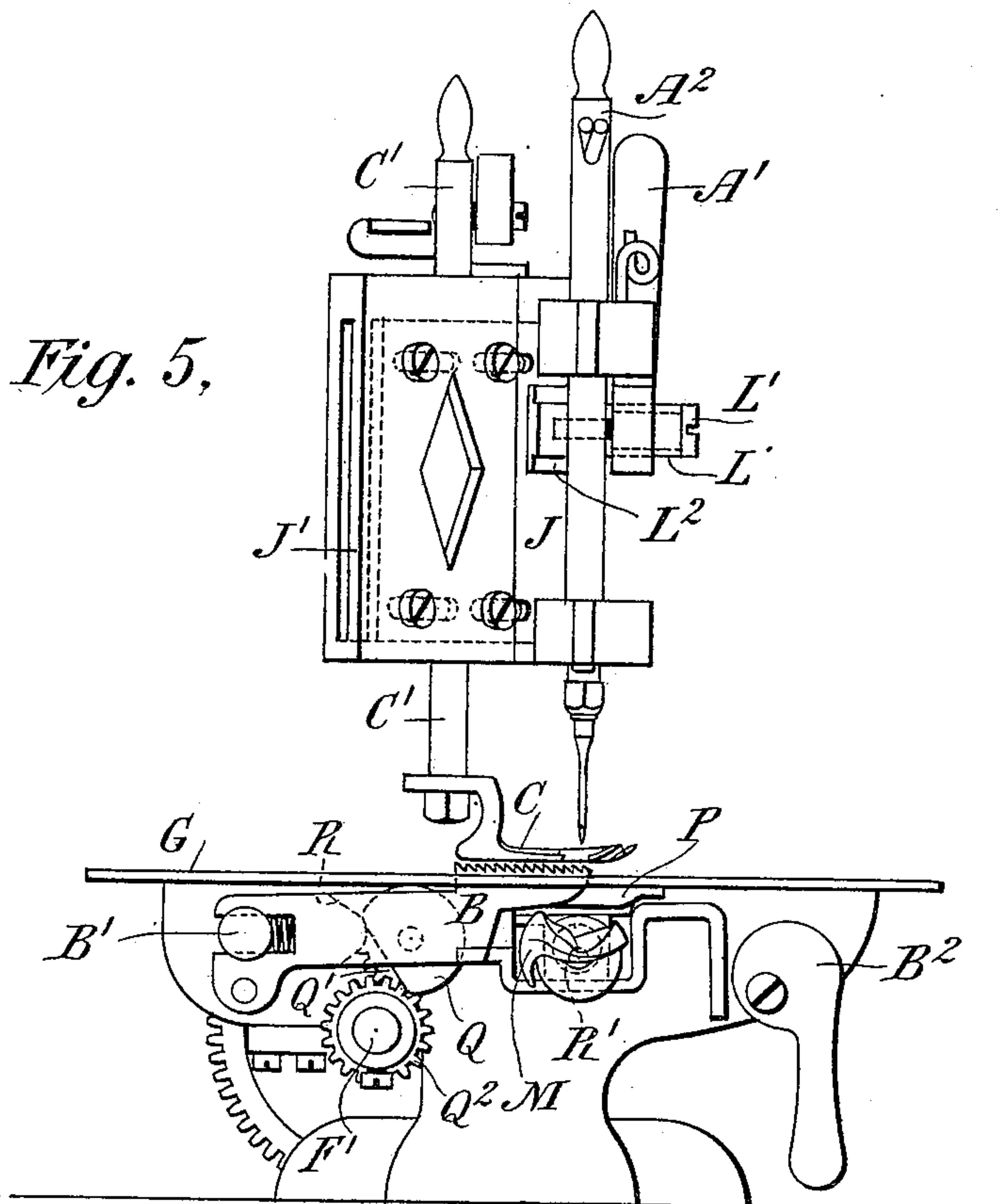
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(No Model.)

6 Sheets—Sheet 3.



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Fig. 7,

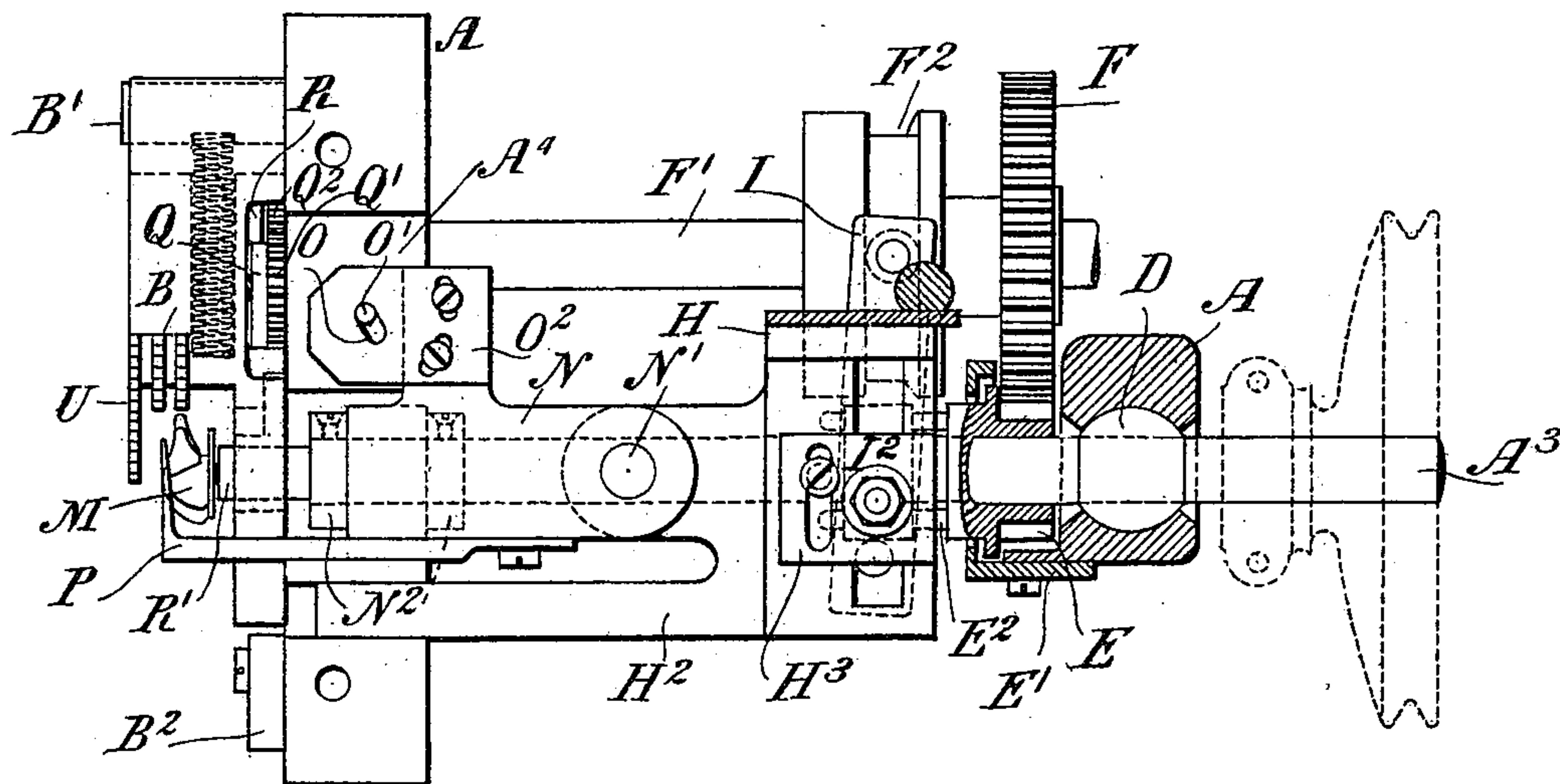
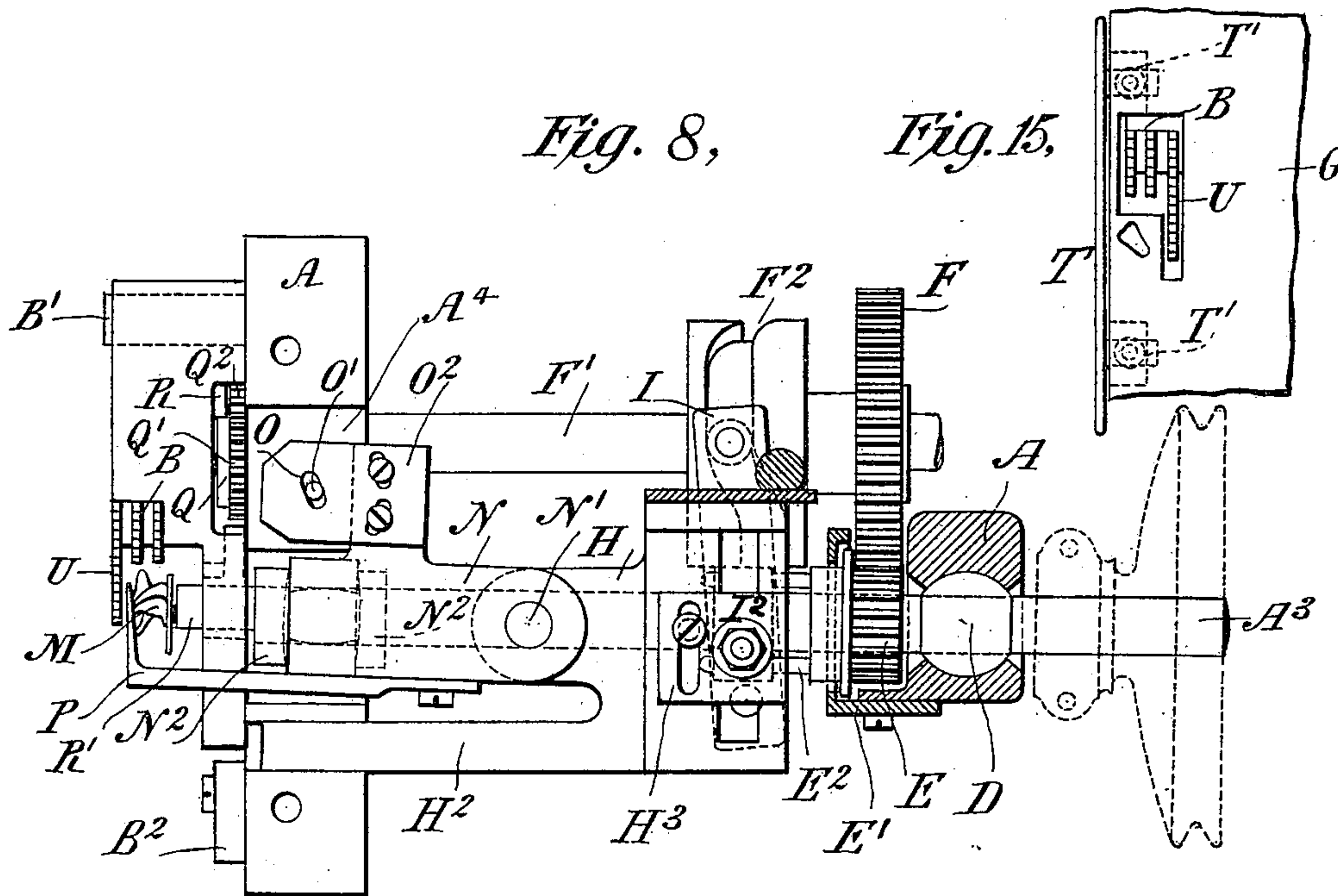


Fig. 8,

Fig. 15,



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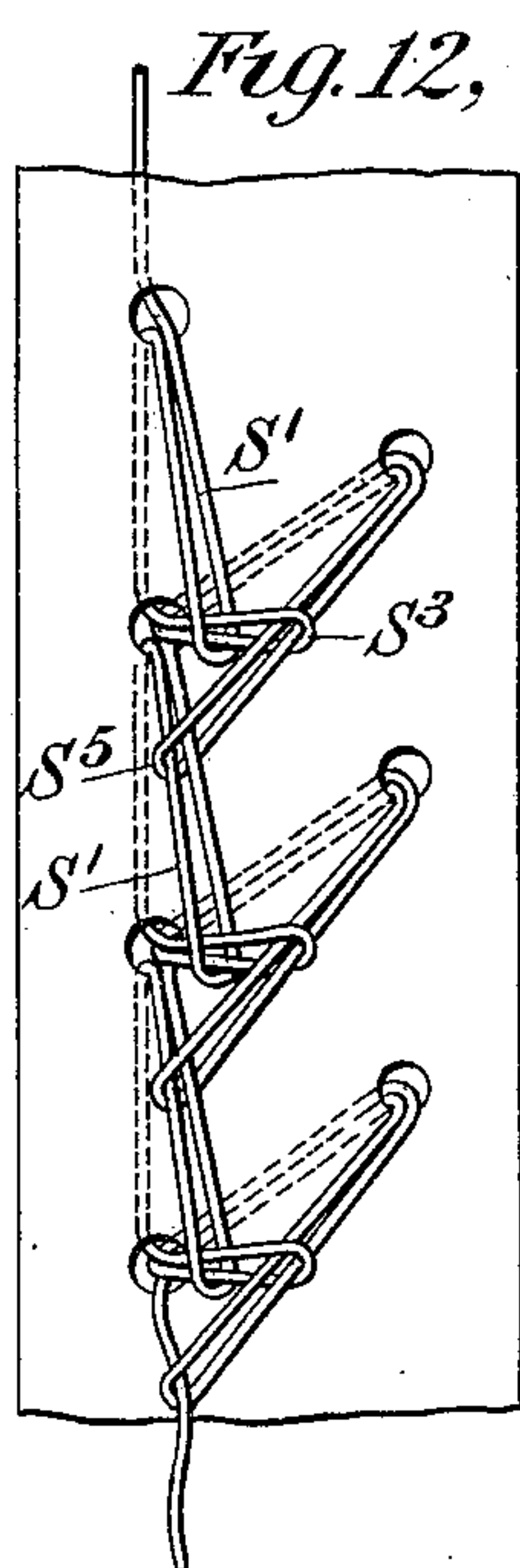
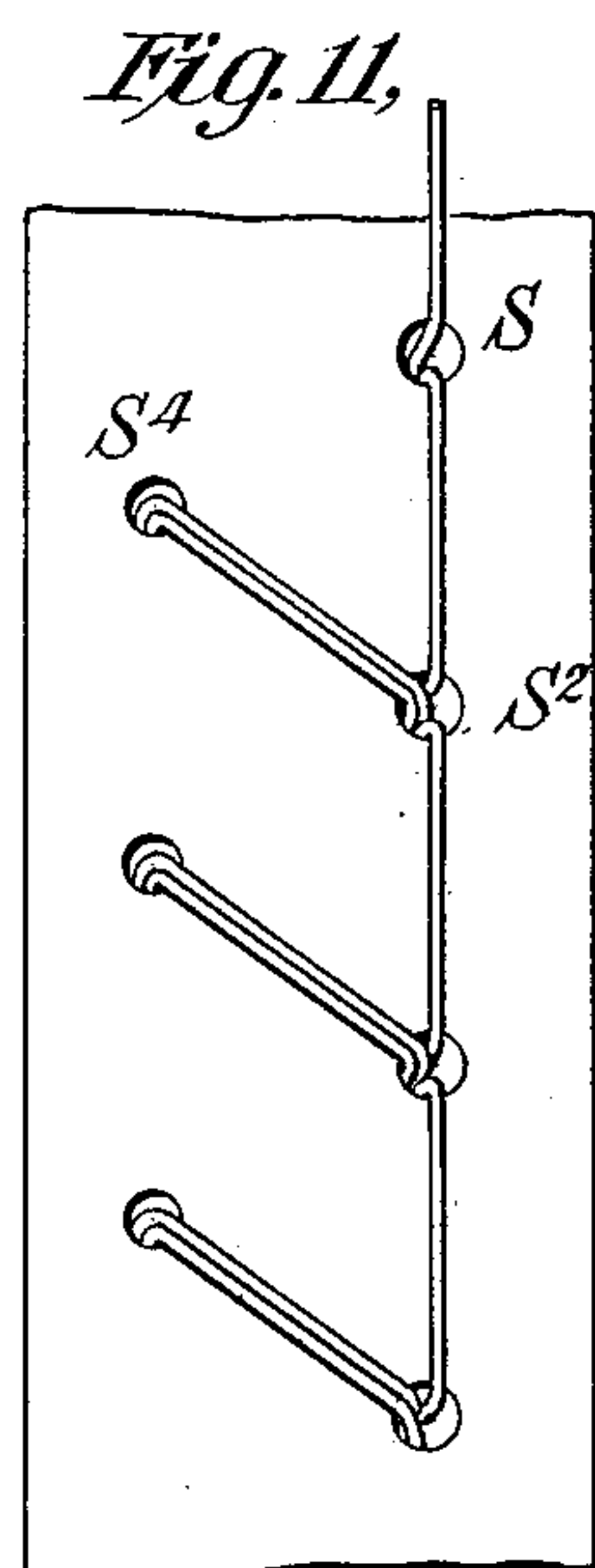
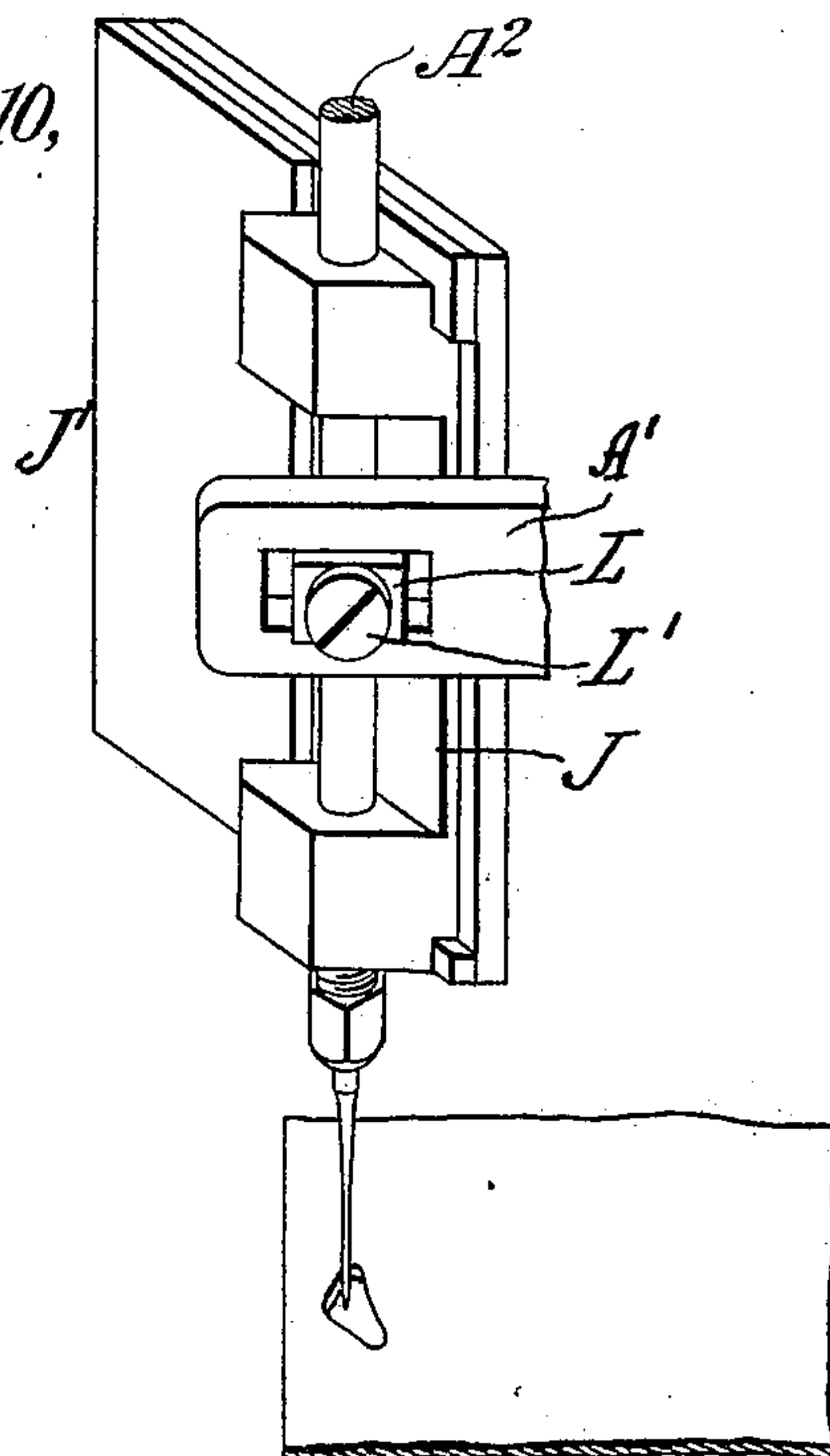
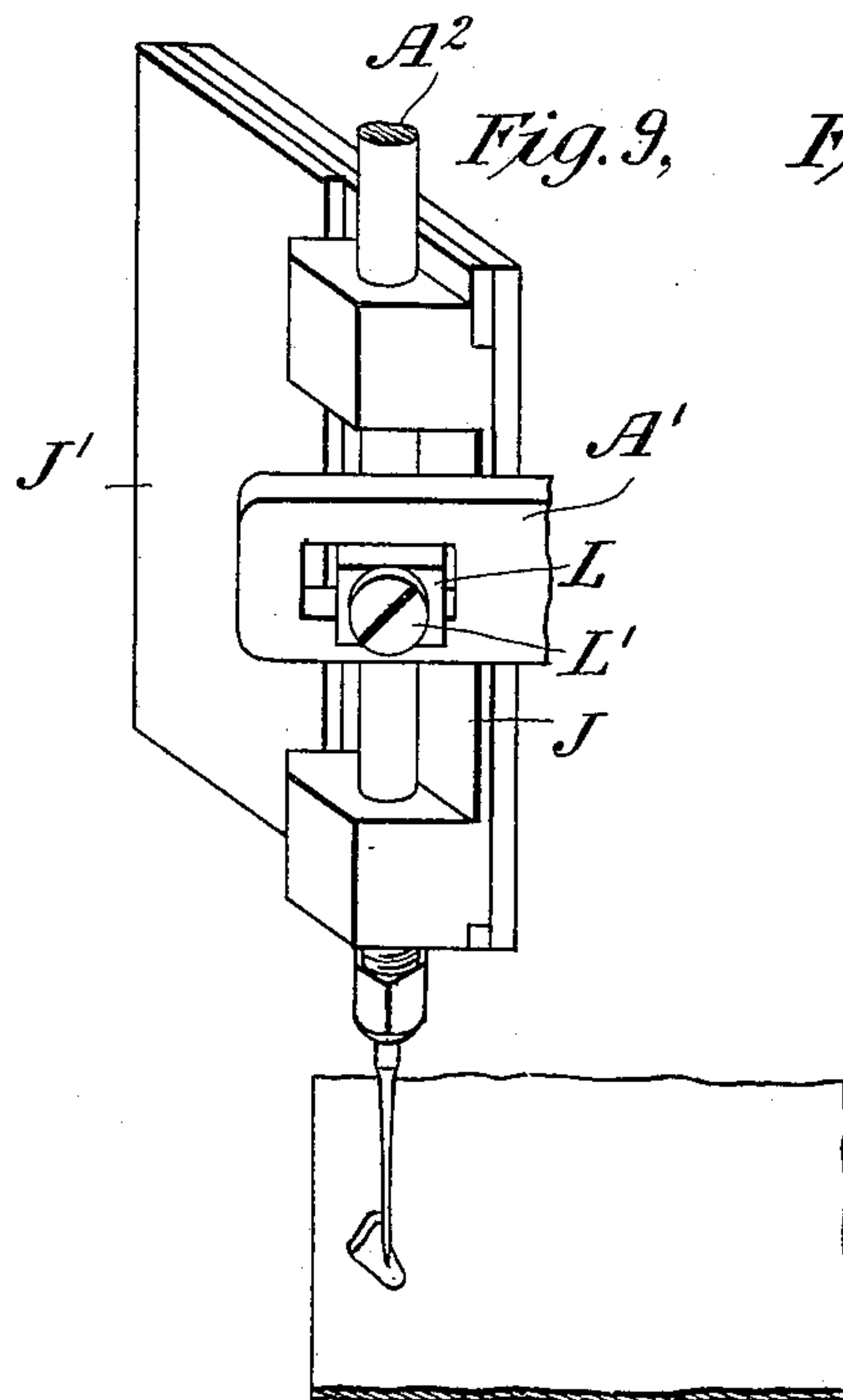


Fig. 13,

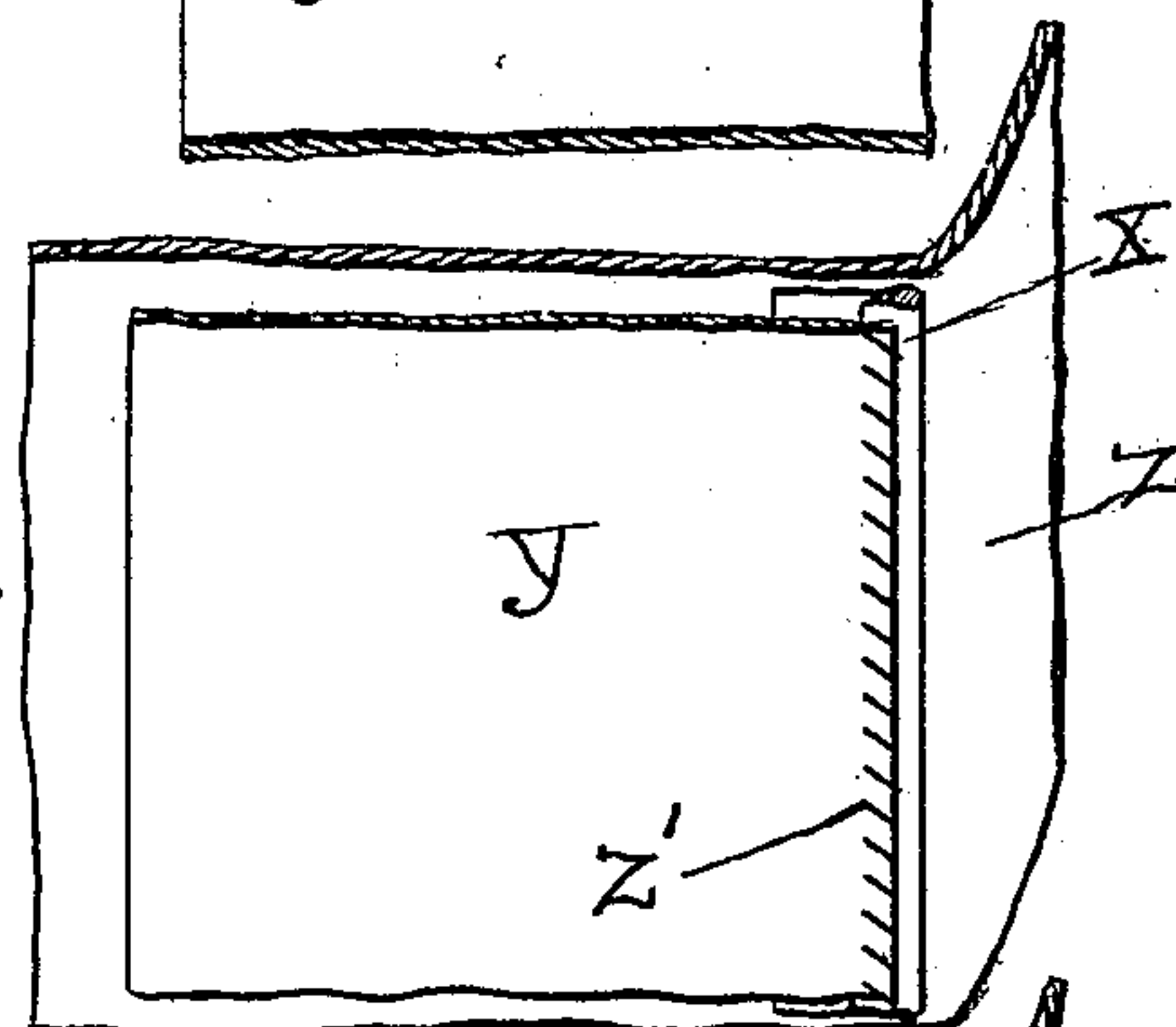
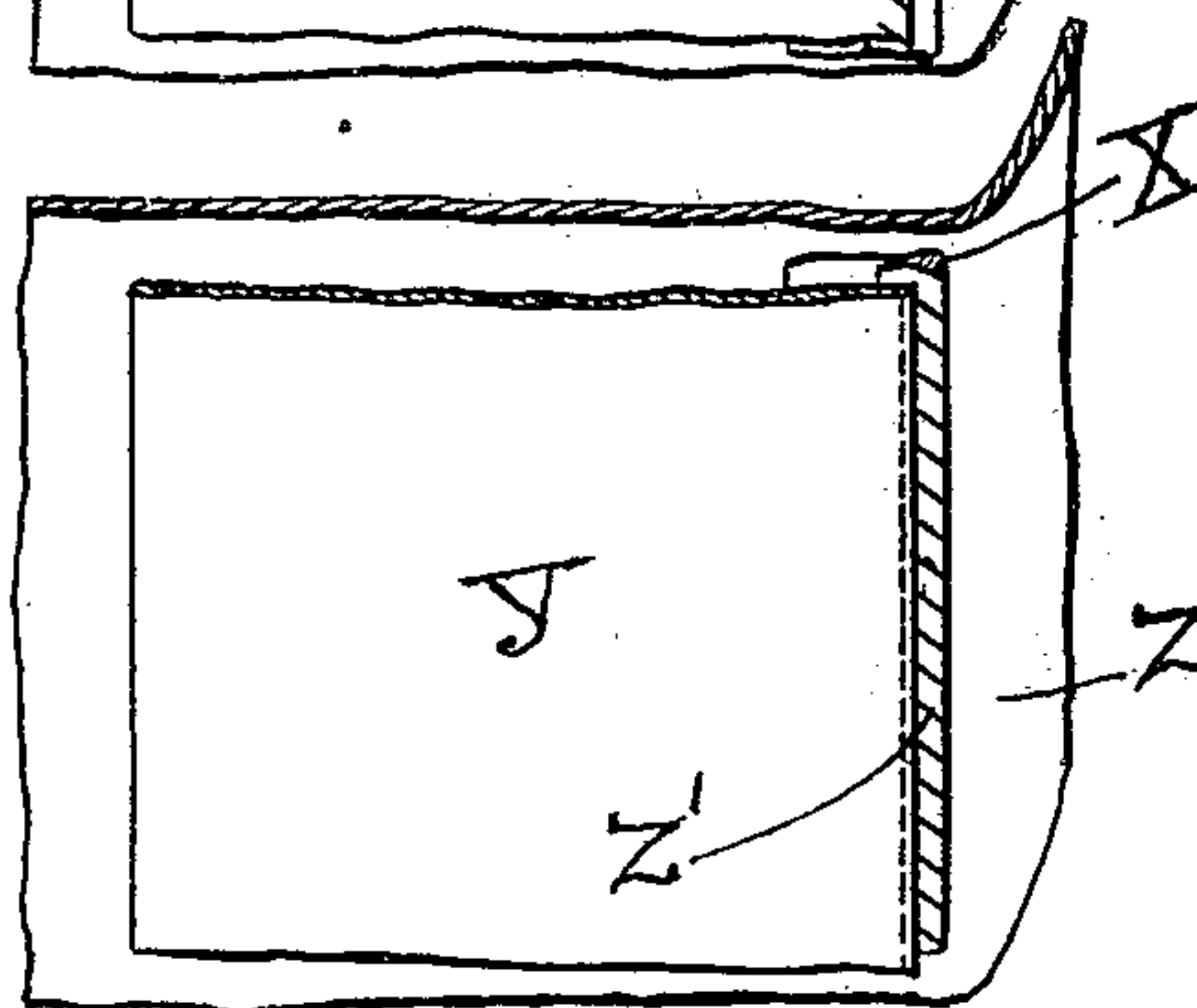


Fig. 14,



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Fig. 16,

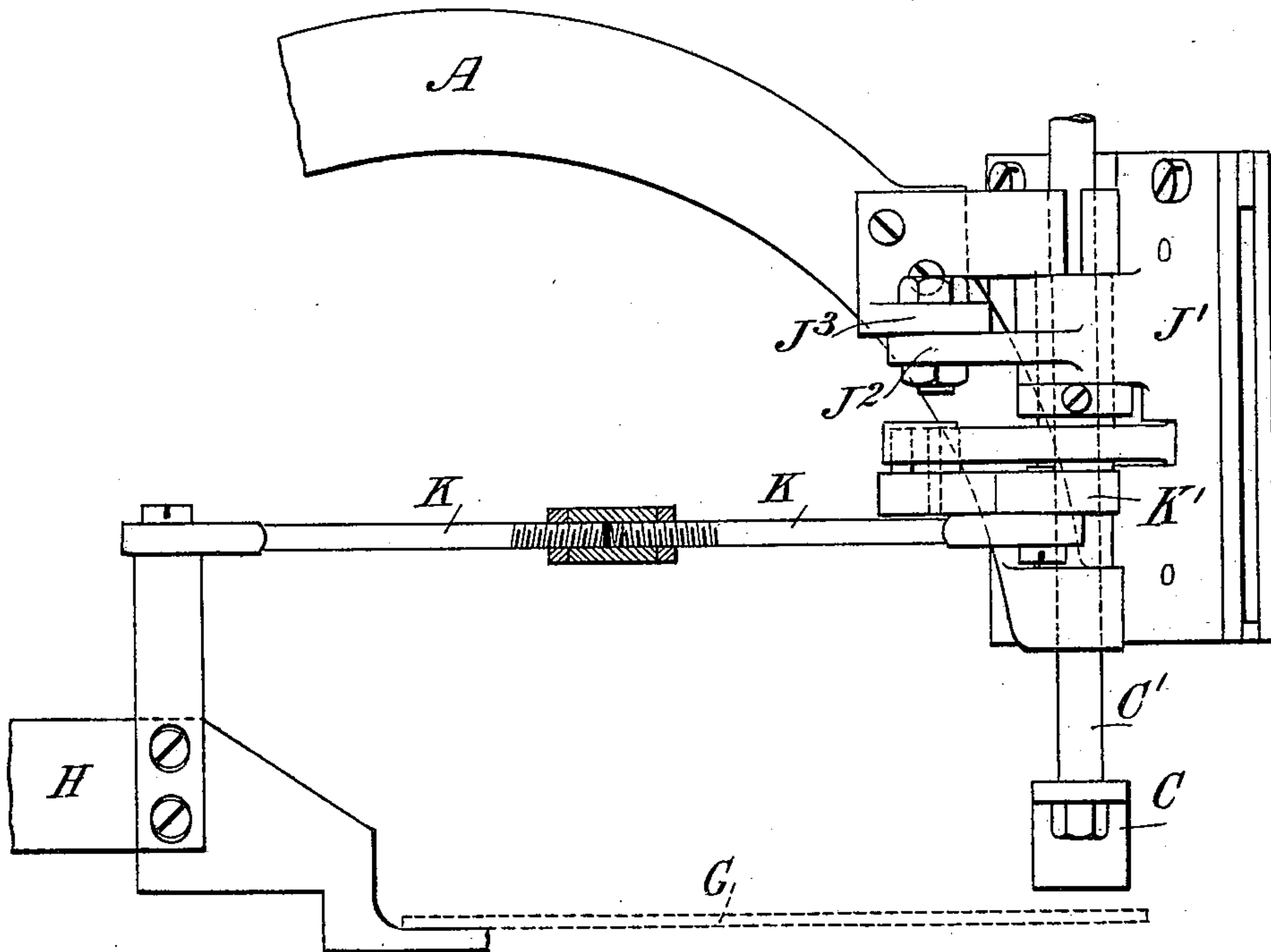
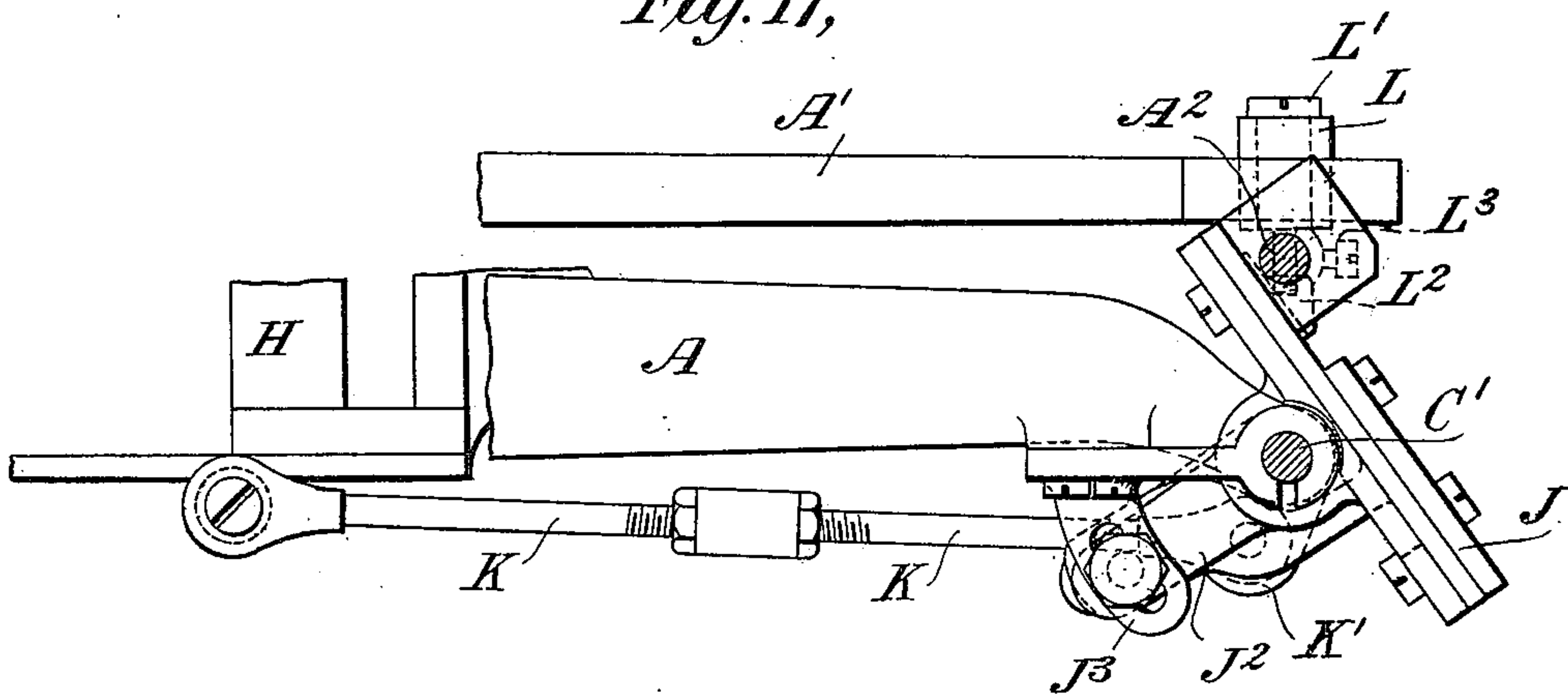


Fig. 17,



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UNITED STATES PATENT OFFICE.

JAMES STEWART, JR., OF PEEKSKILL, NEW YORK, ASSIGNOR OF TWO-THIRDS
TO JAMES D. STEWART AND GEORGE T. STEWART, OF YONKERS, NEW
YORK.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 621,170, dated March 14, 1899.

Application filed August 26, 1897. Serial No. 649,632. (No model.)

To all whom it may concern:

Be it known that I, JAMES STEWART, Jr., a citizen of the United States, residing at Peekskill, in the county of Westchester and State of New York, have invented certain Improvements in Sewing-Machines, of which the following is a specification.

This invention relates to certain improvements in sewing-machines, hereinafter described, designed more particularly to produce a seam of peculiar character specially adapted for securing sweat-bands in hats or to the "reeds," to which they are frequently sewed. Such seam is hereinafter described and is illustrated in the drawings. It is novel and also of my invention. It is, however, not claimed herein, but is claimed in an application filed by me December 6, 1898, Serial No. 698,447.

My invention is shown applied to a sewing-machine of the general style of what is known as the "Willcox & Gibbs" machine, in which the needle-bar is reciprocated vertically through the medium of a rocking arm actuated from a main shaft, which shaft is located beneath the table of the machine and carries on its end a looping-hook arranged beneath the needle to cooperate therewith in forming the stitches.

The new devices embodying my improvements comprise a carrier or slide on which the needle-bar is held and which is constructed and fitted in such manner to the head of the machine as to be movable or slide horizontally obliquely to the main shaft and to the direction of the feed of the machine, this carrier and its bearings being by preference so connected to the head of the machine as to be set in different angular positions, a sliding frame and means for actuating it from the main shaft of the machine to cause it to reciprocate in a direction parallel to the axis of the main shaft, connecting devices between the sliding frame and the needle-bar carrier, means for so controlling the end of the main shaft and the looping-hook carried thereby as to insure said hook being in proper or accurate working position relatively to the needle when the needle assumes its different positions in the formation of this whipping or

overedge stitch, and means for so actuating and controlling the feed device of the machine as to cause it to feed the goods only when the parts of the stitches forming the straight line of the seam are being made. The various parts of my improved machine thus briefly described are provided with suitable means for their adjustment to enable variations in the length and width of the stitch to be made.

Before entering into the details of my invention I would say that I am aware that sewing-machines have been devised for the production of a seam having the general characteristics as regards the appearance of the seam produced by the sewing-stitch here described; but all of such machines have produced such work by the use of two threads locked together in the usual manner of two-thread sewing-machines; but the stitch formed by a single thread, according to my invention, has many advantages over the two-thread stitch and is much better adapted for attaching hat-sweats to hats by reason of its greater flexibility, the interlocking of the loops of the various parts or stages of the stitches being of such a nature that the parts of the threads forming the loops are drawn well into the body of the hat, of whatever material said hat may be, without imparting any undue strain on the part of the hat-sweat embraced by the stitches, the flexibility of the seam being such that it is well adapted for use in sewing hat-sweats to straw hats, which I believe has not heretofore been satisfactorily accomplished by machinery.

To describe my invention more particularly, I will now refer to the accompanying drawings.

Figure 1 is an elevation of the machine embodying my improvements. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section taken on the line 3 3, Fig. 1. Fig. 4 is a horizontal section taken on the line 4 4, Fig. 1. Fig. 5 is an end elevation showing the stitch-forming mechanism. Fig. 6 is a transverse vertical view taken on the line 6 6, Fig. 4. Fig. 7 is a horizontal section taken on the line 7 7, Fig. 1, showing the lower parts of the machine in one position. Fig. 8 is a similar view showing said parts of the machine

in another position. Fig. 9 shows in perspective the needle-bar and its carrier in position for the needle to produce the straight-line sewing. Fig. 10 is a similar view showing the needle in position to produce the lateral parts of the stitches. Fig. 11 represents, on a magnified scale, the upper part of the sewing produced by the machine. Fig. 12 represents how the stitches are formed and looped together on the under side of the goods. Fig. 13 shows the application of the stitch to secure a hat-sweat and reed to a hat. Fig. 14 shows the manner of attaching to a hat a reed previously stitched in any ordinary way to the sweat. Fig. 15 shows a modification in the arrangement of the teeth of the feeding device. Fig. 16 illustrates a provision for the adjustment of the needle-bar carrier on the head of the machine by which its angular position may be varied, and Fig. 17 is a plan view of the same.

The machine shown in the drawings, to which my improvements are attached, consists of the main frame A, the rocking arm A', the vertically-moving needle-bar A², actuated by the outer end of the arm A', the main shaft A³, and the connecting-link A⁴, extending from an eccentric on the main shaft to the short arm of the rocking arm A', the feed B, and the presser-foot C. All of these parts are of the usual construction. As the requirements of the case call for a combined movement of the hook end of the shaft A³, its rear end journal is in a spherical bearing D, which is fitted in the rear end of the frame A. The shaft is free to slide longitudinally in this spherical bearing D, and this bearing provides for a certain lateral movement or rocking of the shaft. The shaft carries in close proximity to the bearing D a pinion E, fitted loosely on the shaft to admit of the longitudinal play of the shaft through it, said pinion being held from longitudinal movement by means of the cap-piece E'; but it is caused to rotate with the shaft by means of the key-pins E² projecting from its hub and passing through holes formed in a collar E³, rigidly secured to the shaft. This pinion E meshes into the gear-wheel F, which is secured to the shaft F', provided with bearings in the main frame of the machine, one at the rear end of the frame in proximity to the bearing D and the other in the forward part of the frame, to which is attached the table G. The teeth of the pinion and wheel are so proportioned that the shaft F' is caused to make one revolution to three revolutions of the main shaft A³, and the teeth of the pinion and of the wheel are cut sufficiently deep to allow for the horizontal rocking motion of the shaft A³ without causing any binding action between the teeth. The variations of distance between the pitch-centers of the pinion E' and the wheel F due to the departure from parallelism of the shaft A³ from the shaft F', are at the part of the shaft which carries the pinion E very slight by reason of the

said pinion being near the center of oscillation of the shaft, so that there will be practically no interference with the proper working of the teeth of the pinion and the wheel. The frame H, located over the shaft A³, is fitted to slide in a direction longitudinal to the shaft and is guided by an upwardly-projecting arm which has a bearing at H' at the rear end of the frame A and a bearing H² in the top of the forward end of the frame immediately below the table G. This frame H is controlled by and actuated from the cam F², secured to the shaft F', through the medium of the lever I, which is provided with a roller working in the groove of the cam and is pivoted at its other end to the post I', projecting upwardly from the frame A. This lever is provided with a sliding fulcrum I², which passes through the plate H³, adjustably secured to the top of the sliding frame H by means of a screw which passes through a slot in the plate H³ in such manner that the fulcrum I² may be set in different positions on the lever I, and thereby cause the plate H to be moved different distances as the outer end of the lever is actuated by the cam F².

The object of providing adjustable movement to the plate H is to admit of varying the distance that the needle and the hook are moved in forming the lateral parts of the stitches, as both the needle and the hook are controlled by the sliding plate in being moved to and from their oblique positions from the straight line of sewing in the formation of said lateral parts of the stitches.

The needle-bar A² is fitted to slide vertically in bearings formed on the carrier J, which carrier is held in the box J' so as to be free to slide horizontally therein, and said box is secured to the head of the machine. In Figs. 1, 2, and 5 this box J' is shown permanently attached to the head of the machine, arranged in angular position thereto, and in Figs. 16 and 17 it is shown so attached to the head that it may be set in different angular positions, it being there shown provided with a hub on its rear side fitted to embrace a sleeve through which the stem C' of the presser-foot C passes and is upheld by means of a collar bearing against the under side of the hub. An arm J², projecting from the hub, is provided with a clamping-bolt which passes through a slot formed in the piece J³, which is secured to the frame of the machine. A projection from this piece forms the upper bearing of the stem C' of the presser-foot C. The slot in this piece is curvilinear and has for its center the center of the sleeve upon which the hub of the box J' is fitted, and by this means it will be seen that the box and the carrier contained therein may be set and firmly held in any desired angular position by means of the clamping-bolt which passes through the arm J² and the piece J³. Reciprocating motion is imparted to the carrier J from the sliding frame H through the medium of the rod K, which is pivoted at one end to a

stud projecting upwardly from the sliding frame H and at its other end to a lever K', which has its bearing on the stem C' of the presser-foot C, so as to rock thereon. Another arm of this lever K', angularly arranged to the pivotal connection of the rod K therewith, is provided at its end with a pivotal block formed to fit in the forked end of an arm K³, which arm is attached to or forms a part of the carrier J. The center of this pivotal block and the center of the stem C' upon which the lever K' rocks are so related to one another that the pivotal block will move about equal distances as the lever K' is rocked on each side of a perpendicular from the carrier J through the center of oscillation of the lever K'. To provide for a proper location of the needle-bar when the carrier and its box are set in different angular positions, the rod K is shown at Figs. 16 and 17 provided with a means for varying its length, said means being shown as a turnbuckle. The connection between the needle-bar A² and the end of the arm A' consists of a rectangular block L, held on the screw-stud L', secured to the needle-bar, and a rectangular slot formed through the end of the arm A', in which the block L fits, said slot being sufficiently long for the proper play of the block therein as the arm is reciprocated, and to provide for the outer movement of the needle-bar when the needle goes in position to produce the lateral portions of the stitches the block is sufficiently long to be retained in the slot, so as to be properly actuated by the arm as the needle-bar is moved into oblique positions relatively to the line of motion of the end of the arm A'. To prevent the needle-bar and the needle carried thereby rotating on their axes, a block L² is attached to the needle-bar A² and has a flat face fitted to slide against the flat face of the carrier J. Where this carrier J and its box are made adjustable, this block L² is preferably adjustably attached to the needle-bar A², as shown in Fig. 17, in which a set-screw L³ is shown for this purpose. This adjustability of this block L² is advantageous, as the needle-bar may be thereby set and retained in correct working position when the carrier J is set to operate in different angular positions.

The means employed for causing the looping-hook M, which is carried at the end of the shaft A³, to work in unison with the needle—that is, to follow the needle as it moves in the different positions to form the stitch—consist in forming the outer bearing of the shaft A³ on the plate N, which plate is pivoted at N' to the sliding frame H. This plate N, or, by preference, a flat piece O², secured thereto by means of screws passing through slots in the piece O², extends forward, so as to rest in a recess A⁴, formed in the upper face of the forward part of the frame A, and a stud O', screwed or otherwise secured in the recess A⁴, extends upwardly into an angularly-arranged slot O, formed through the piece O², as shown

in Figs. 7 and 8, and said slot O is caused to play on the stud O' or on a roller placed on the stud when the sliding plate H is reciprocated, thereby controlling the lateral movements of the hook M through the medium of the bearing-shaft A³, which is carried by the plate N, mounted on the movable plate or frame H. The table G, when secured in place on the upper face of the forward part of the frame A, covers these parts and holds the forward part of the plate N or piece O², attached thereto, in the recess A⁴ and over the stud O'. The angular direction of the slot O may be such, and is within certain limits adjustable, as to cause the hook M to move laterally as well as longitudinally, so as to travel substantially coincidently with the needle, according to the degree of angular movement imparted to the needle, to produce the lateral branches of the stitches. Of course the slot O may be formed in the plate, so as to be at a more acute angle to the axis of the shaft or even to be parallel therewith, as in such cases the hook M will properly perform its function in taking the thread from the needle in the two positions assumed by the needle.

To prevent any longitudinal movement of the shaft A³ relative to the sliding frame H, and thus to cause the hook to move laterally with the needle, collars N², secured to the shaft A³, embrace the sides of the bearing on the plate N, in which the forward end of said shaft A³ rotates. To provide for the slight binding action that would occur between the shaft and its bearing on the plate N, due to the centers of oscillation of the shaft and of the bearing not being coincident, the journal of the said bearing of the outer end of the shaft may be made slightly spherical, as may also the contact-surfaces of the collars N² with said bearing, or a slight lateral play may be given to the pivotal connection N' of the plate N and sliding frame H. This pivotal connection N' would for practical purposes be located as near to the spherical bearing D as possible, it being shown in the drawings set much nearer the end of the shaft A³ than is necessary. A guard P, which lies above and is about in a plane with the outer point of the sliding hook M, is secured by means of a screw passing through the slot in the rear end of same to the plate N. This slot admits of its proper adjustment, and it is caused by being attached to the plate N to always retain its relative position to the hook in whatever position the hook may be, the object of the guard being to guide the thread as it passes between the needle and the hook when these devices are changing their lateral positions relatively to the goods being sewed.

The feeding device B is in general of the form shown, being supported by and rocking on the stud B' and retracted by a spring bearing against said stud, and is controlled in its sliding movement by the cam-lever B² in the usual manner to vary the length of stitches. The feed, it will be understood, is required

to be actuated once only to every three revolutions of the machine, and this when the straight line of the sewing is being produced. To enable this to be accomplished, I provide
 5 the cam Q, secured to the pinion Q', which is arranged to rotate on a stud projecting from the front face of the frame, and a pinion Q², of equal size with the pinion Q' and meshing therewith, secured to the outer end of the
 10 cam-shaft F', and a projection R on the feed B, arranged to bear against the periphery of the cam Q. This cam Q has so much of its periphery circular in form as is necessary to hold the feed back during two revolutions of
 15 the machine and is cut away to allow the feed to be retracted and is formed to push the feed forward during the other revolution of the machine, which feeding action is represented as taking place at Fig. 5 of the draw-
 20 ings. The feeding device so far as described provides only for the backward and forward movement of the feeding device. To impart the up-and-down movement of said feeding device, the usual eccentric formed on the end
 25 of the shaft of this class of machine is employed, said eccentric being shown at R' as working in a sliding block held in the frame of the feeding device. The feeding device will by this construction be raised three times
 30 for each complete stitch made, and as the feed is operated only every third reciprocation of the needle the two extra vertical movements of the feed device have no useful result, but in no manner interfere with the
 35 proper working of the other parts of the machine.

In describing the operation of the machine I will refer to Figs. 11 and 12, which illustrate the kind of stitch formed by the ma-
 40 chine. The needle first punctures the goods, as at S, and the loop S' is formed, the positions of the different parts of the machine at this time being as shown in Figs. 1, 2, 7, and 9. When the needle leaves the goods after form-
 45 ing this first stage of the stitch, the feeding forward of the goods then occurs. The relative positions of the different parts of the machine occupied are as shown in Fig. 5. The needle then punctures the goods, as at S², to
 50 produce the loop S³ on the under side, said loop in its formation being passed through the loop S'. The oblique lateral movement of the needle and hook now takes place, as shown at Figs. 8 and 10, and the needle punc-
 55 tures the goods, as at S⁴, and the loop S⁵ is formed and passes through the loop S³. No feeding action of the goods takes place during the formation of this part of the stitch. The needle and the hook are now moved back
 60 into their original positions and the needle again punctures the goods at S², the goods still remaining stationary, and another loop S' is formed, which loop passes through the loop S⁵ of the oblique lateral part of the stitch.
 65 This second looping S' constitutes the first stage or part of the second stitch, and the operations as just described are repeated. It

will be observed from Fig. 12 that there is a peculiar triangular locking of the three loops of the various stages of each completed stitch, 70 which affords great security to the seam and also provides for the flexibility of the seam before referred to, as said interlocked looped parts of the stitches will be more or less tightly drawn into the goods, according to the quality 75 of the goods being acted upon.

Fig. 15 is a plan of the feeding device, showing a modification of the arrangement of the gripping-teeth and in a guide device for the adjustment of a hat or other article being 80 sewed relatively to the needle, which guide consists of a narrow bar T, provided with arms which extend into sockets formed on the under side of the table G and is held in its adjusted position by set-screws, shown 85 by dotted lines T'. The change in the teeth of the feed consists in moving the long row of teeth U from the outside of the needle, as shown at Figs. 7 and 8, to the inside of the 90 needle, as here shown. This admits of the bend of the rim and crown of hats being brought nearer to the needle, it being understood, of course, that the guide T may be re-
 95 moved when it is desired to form the stitches very close to the bend of the hat.

Fig. 13 shows a reed X and sweat Y secured to a hat Z by the stitching Z', produced by this machine. Fig. 14 shows a sweat Y stitched in any ordinary way to a reed X and the reed secured to the hat Z by stitches Z', 100 produced by this machine.

I claim as my invention—

1. In a sewing-machine, the combination of a needle-bar and its needle, a feeding device actuated every third reciprocation of the needle, a carrier for the needle-bar fitted to move 105 horizontally in a lateral direction, a looping-hook located beneath and fitted to move laterally to cooperate with the needle, and mechanism for effecting the lateral movements of the needle-bar carrier and the looping-hook. 110

2. In a sewing-machine, the combination of a needle-bar and needle carried thereby, a carrier for the needle-bar fitted to slide horizontally in an oblique direction, means for 115 actuating the needle-bar carrier, a looping-hook located beneath and arranged to cooperate with the needle, means for moving the hook coincidently with the needle, and a feeding device maintained inoperative when the 120 needle is moved to and from its oblique position.

3. In a sewing-machine, the combination of a needle-bar and needle carried thereby, a carrier for the needle-bar fitted to slide horizontally in an oblique direction, means for 125 actuating the needle-bar carrier, a looping-hook located beneath and arranged to cooperate with the needle, means for moving the hook coincidently with the needle, a feeding 130 device, and means for actuating it to feed the goods only at every third operation of the needle and when the needle is in its normal position.

4. In a sewing-machine, the combination of a needle-bar and needle carried thereby, a carrier for the needle-bar fitted to move horizontally in a lateral direction, mechanism for setting the carrier in various angular positions to vary the obliquity of its lateral movement, a looping-hook located beneath and arranged to cooperate with the needle, and means for effecting the lateral movements of the needle-bar carrier and the looping-hook.

5. In a sewing-machine, the combination of a needle-bar and needle carried thereby, a carrier for the needle-bar fitted to slide horizontally in an oblique direction, means for actuating the needle-bar carrier, a looping-hook located beneath and arranged to cooperate with the needle, a main shaft to the end of which the looping-hook is attached, and means for moving this end of the shaft horizontally to cause the hook to follow the horizontal movements of the needle.

6. In a sewing-machine, the combination of a needle-bar and needle carried thereby, a carrier for the needle-bar fitted to slide horizontally in an oblique direction, means for actuating the needle-bar carrier, a looping-hook located beneath and arranged to cooperate with the needle, a main shaft to the end of which the looping-hook is attached, means for moving this end of the shaft horizontally to cause the hook to follow the horizontal movements of the needle, a feeding device, an eccentric near the end of the shaft for controlling the vertical movements of the feed device, and means for actuating the feeding device to feed the goods at every third operation of the needle and when the needle and the hook are in their normal positions.

7. In a sewing-machine, the combination of a needle-bar and its needle, a feeding device actuated every third reciprocation of the needle, a carrier for the needle-bar fitted to move horizontally in a lateral direction, a looping-hook located beneath and fitted to move laterally to cooperate with the needle, mechanism for effecting the lateral movements of the needle-bar carrier and the looping-hook, and means for adjusting said mechanism to vary the lateral movements of the needle-bar carrier and the looping-hook.

8. In a sewing-machine, the combination of a needle-bar and needle carried thereby, a carrier for the needle-bar fitted to slide horizontally in an oblique direction, adjustable means for actuating the needle-bar carrier, a looping-hook located beneath and arranged to cooperate with the needle, means for moving the hook coincidently with the needle, a feeding device maintained inoperative when the needle is moved to and from its oblique position, and means for moving and means for adjusting the throw of the feed when the needle is in its normal position.

9. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a

carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, and a looping-hook at the end of the main shaft.

10. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, and means for setting the carrier-bar in different angular positions.

11. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearing on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, and means for causing the hook to follow the horizontal movements of the needle.

12. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, means for setting the carrier-bar in different angular positions, and adjustable means for causing the hook to follow the horizontal movements of the needle.

13. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, and a feed and operating devices to cause it to act every third revolution of the machine only.

14. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearing on the carrier, a main shaft, located beneath the table, provision for vertically reciprocating the needle-

bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, means for causing the hook to follow the horizontal movements of the needle, and a feed and operating devices to cause it to act every third revolution of the machine only.

15. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, a rocking sliding bearing at the driving end of the main shaft, and means for causing the other end to which the hook is attached to move obliquely horizontally.

16. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, a rocking sliding bearing at the driving end of the main shaft, means for causing the other end to which the hook is attached to move obliquely horizontally, and a feed and operating devices to cause it to act every third revolution of the machine only.

17. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, a feeding device, an eccentric at the hook end of the shaft, and a cam acting on the feeding device operated from the main shaft so as to rotate at one-third the speed thereof.

18. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, means for moving the needle-bar carrier, a looping-hook at the end of the main shaft, means for setting the carrier-bar in different angular positions, ad-

justable means for causing the hook to follow the horizontal movements of the needle, a feeding device, an eccentric at the hook end of the shaft, and a cam acting on the feeding device operated from the main shaft so as to rotate at one-third the speed thereof.

19. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, a pinion on the main shaft, a gear-wheel meshing therewith and having three times as many teeth, a shaft to which this gear-wheel is attached, a cam also secured to this shaft, a sliding frame, provisions for actuating this frame from the cam, and connections between the frame and the needle-bar carrier.

20. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, a pinion on the main shaft, a gear-wheel meshing therewith and having three times as many teeth, a shaft to which this gear-wheel is attached, a cam also secured to this shaft, a sliding frame, provisions for actuating this frame from the cam, connections between the frame and the needle-bar carrier, a rocking bearing at the driving end of the main shaft, and means connecting the sliding frame to the bearing at the other end of the main shaft, whereby it is caused to move obliquely horizontally.

21. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, a pinion on the main shaft, a gear-wheel meshing therewith and having three times as many teeth, a shaft to which this gear-wheel is attached, a cam also secured to this shaft, a sliding frame, provisions for actuating this frame from the cam, connections between the frame and the needle-bar carrier, a feeding device, a pinion on the end of the cam-shaft, another similar-sized pinion meshing therewith, a cam on this latter pinion, and a projection or lug on the feeding device against which this cam works.

22. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the ta-

ble, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, a pinion on the main shaft, a gear-wheel meshing therewith and having three times as many teeth, a shaft to which this gear-wheel is attached, a cam also secured to this shaft, a sliding frame, a lever actuated by the cam, an adjustable fulcrum connection between the lever and the sliding frame, and means for imparting motion from the sliding frame to the needle-bar carrier.

23. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, a pinion on the main shaft, a gear-wheel meshing therewith and having three times as many teeth, a shaft to which this gear-wheel is attached, a cam also secured to this shaft, a sliding frame, provisions for actuating this frame from the cam, a rocking two-armed lever, one arm of which acts on an arm projecting from the carrier,

and a rod connecting the sliding frame to the other arm of this lever. 30

24. In a sewing-machine, the combination of a table, a frame extending above and below the table, a box attached in angular position to the head of the frame above the table, a carrier fitted to slide in said box, a needle-bar having its bearings on the carrier, a main shaft located beneath the table, provision for vertically reciprocating the needle-bar from the main shaft, a pinion on the main shaft, a gear-wheel meshing therewith and having three times as many teeth, a shaft to which this gear-wheel is attached, a cam also secured to this shaft, a sliding frame, provisions for actuating this frame from the cam, a rocking two-armed lever, one arm of which acts on an arm projecting from the carrier, a longitudinally-adjustable rod connecting the sliding frame to the other arm of this lever, and means for setting the carrier and its box into different angular positions. 40 45 50

In testimony whereof I have hereunto subscribed my name.

JAMES STEWART, JR.

Witnesses:

FRANK S. OBER,
ALFRED SHEDLOCK.