

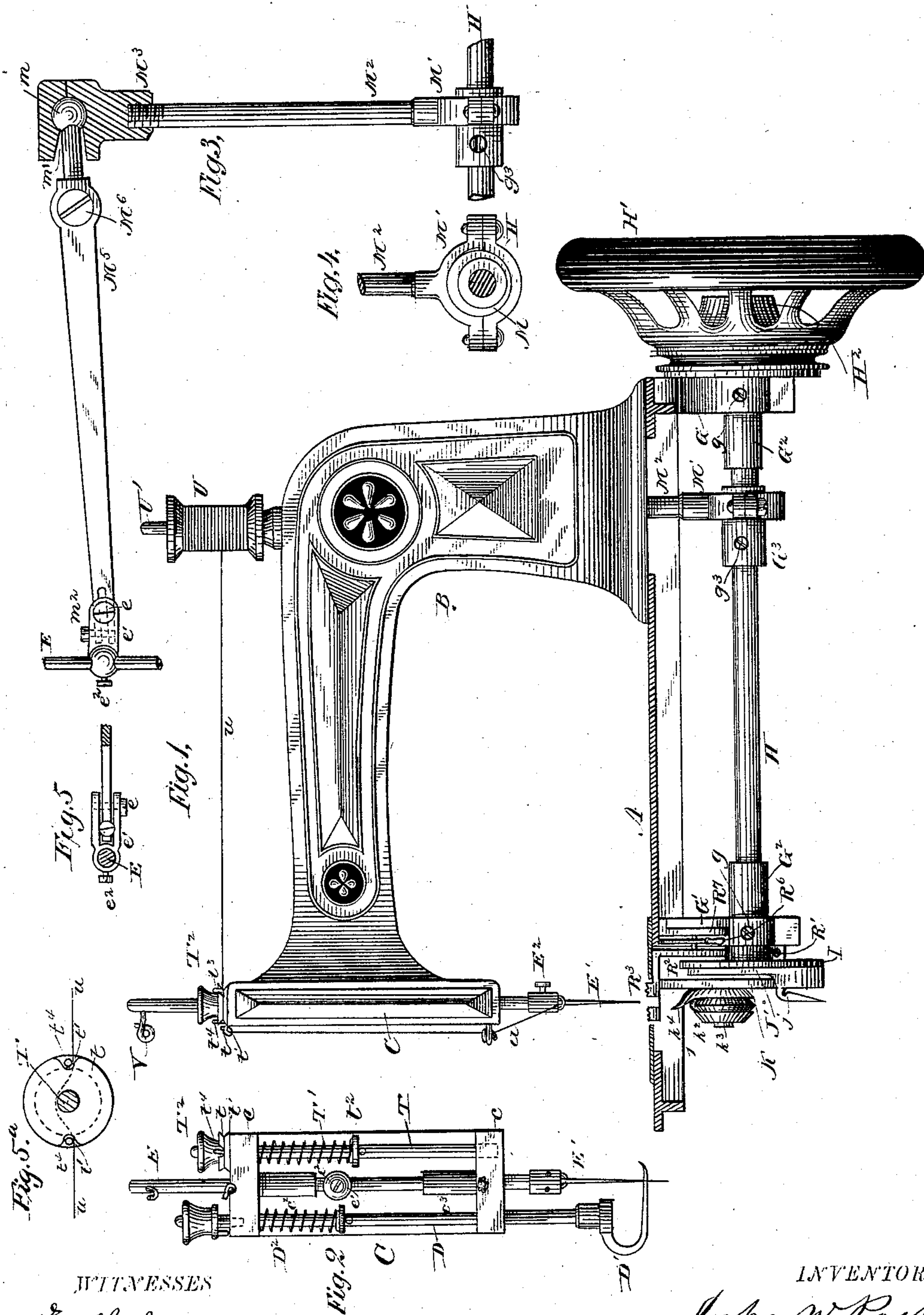
(No Model.)

5 Sheets—Sheet 1.

J. W. POST.
SEWING MACHINE.

No. 287,576.

Patented Oct. 30, 1883.



WITNESSES

E. L. Grumanns
Henry Calver.

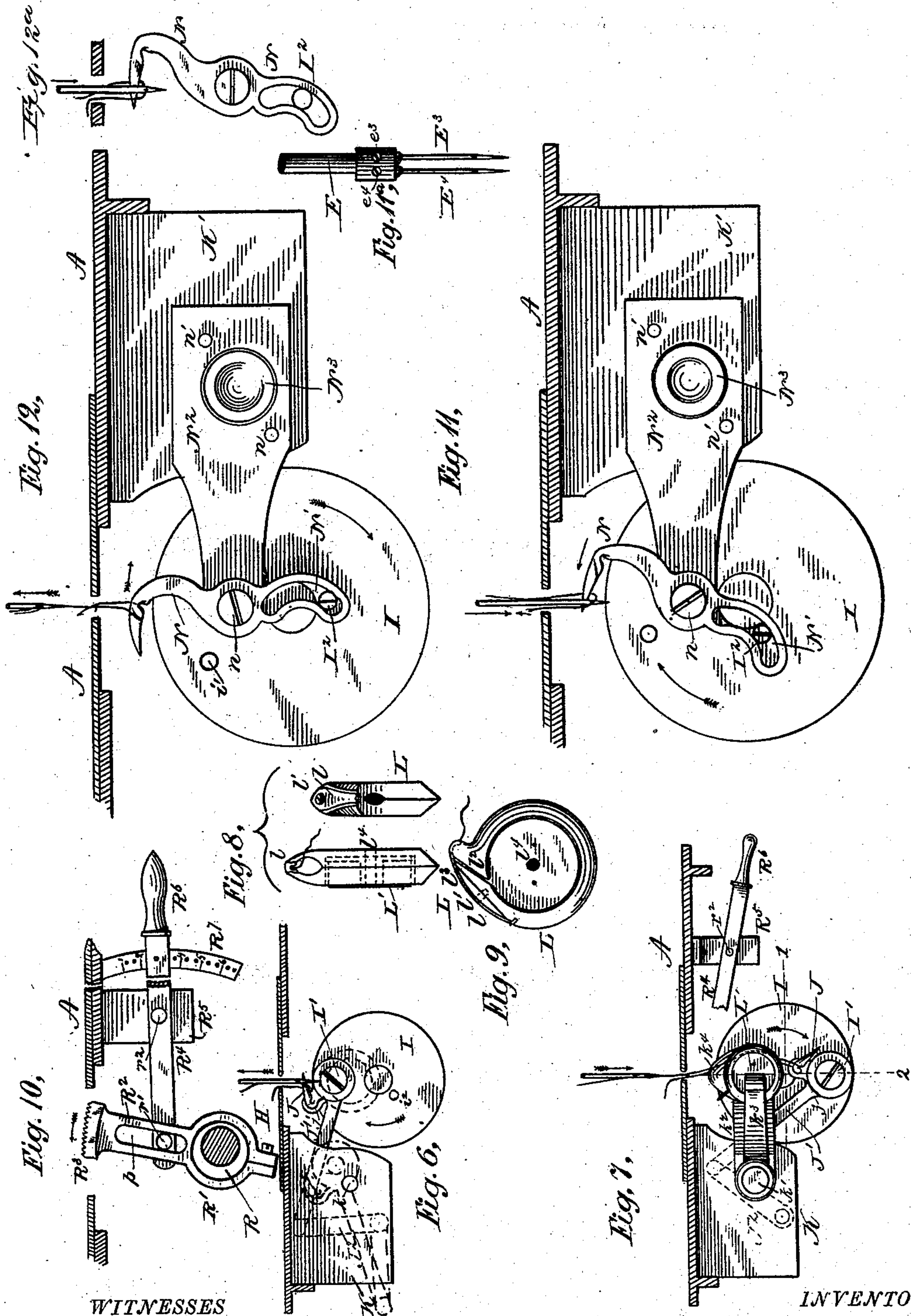
INVENTOR

John W. Post

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WITNESSES

E. L. Gruman
Henry Calver

INVENTOR

John W. Post

(No Model.)

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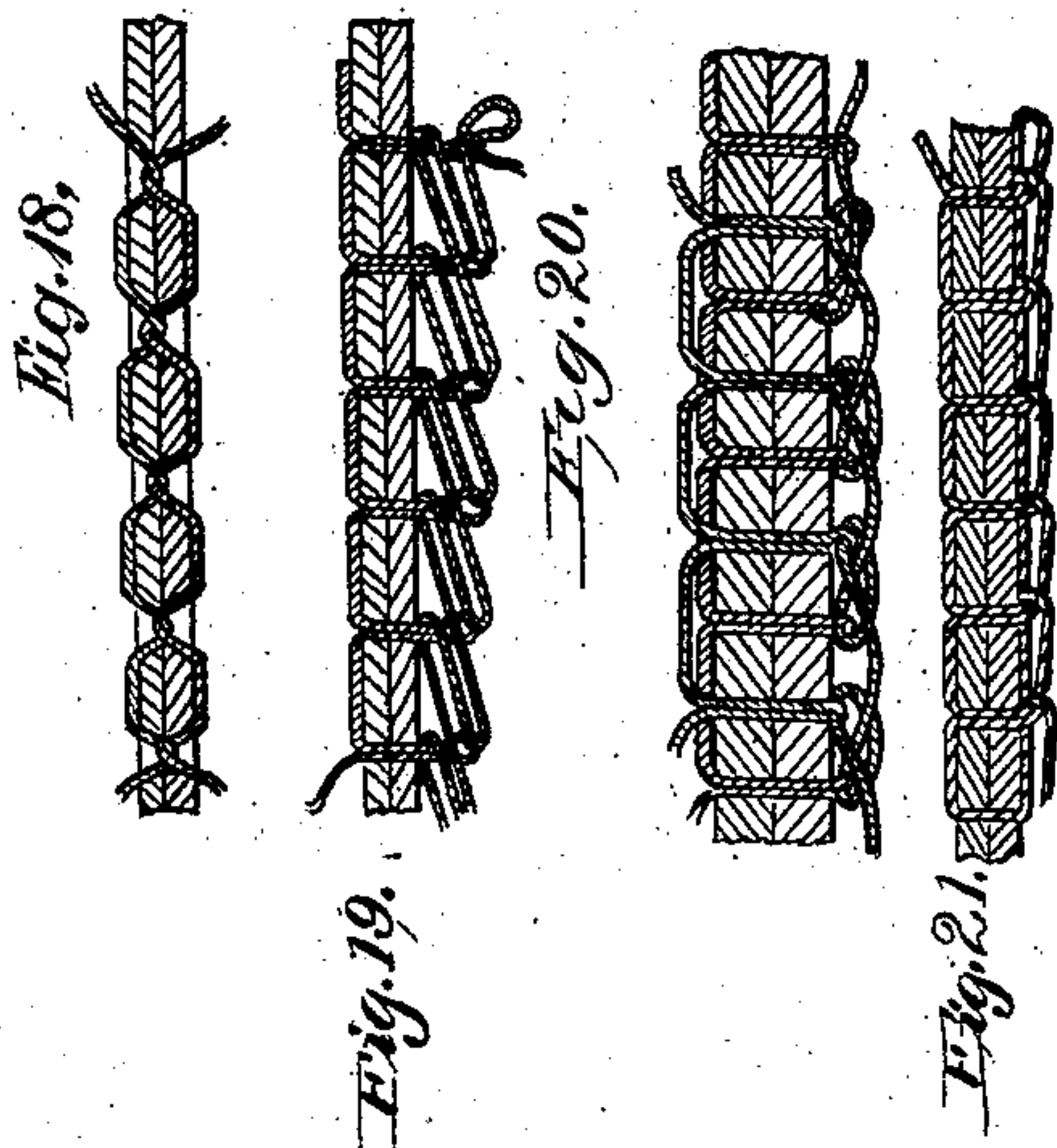
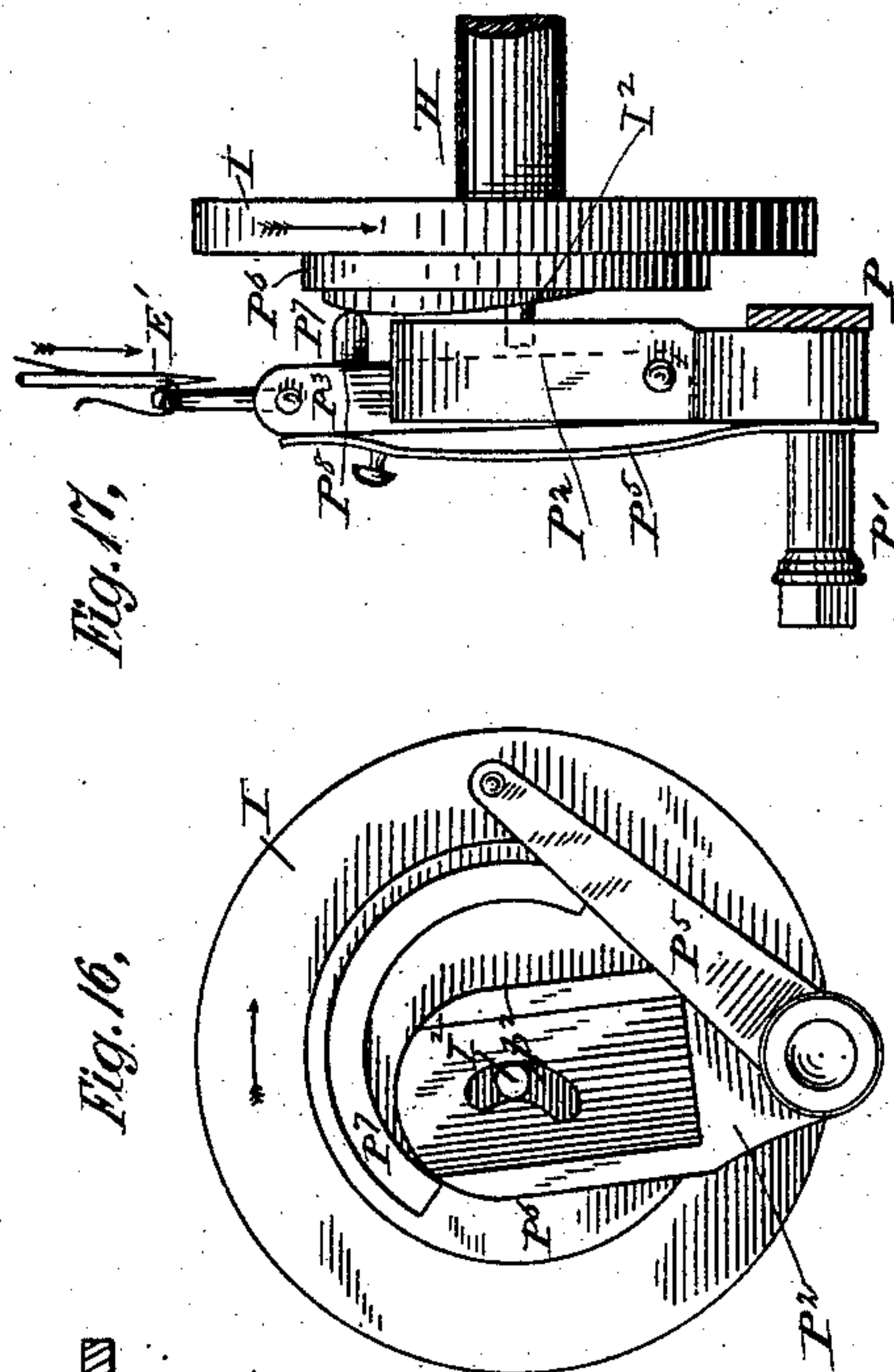
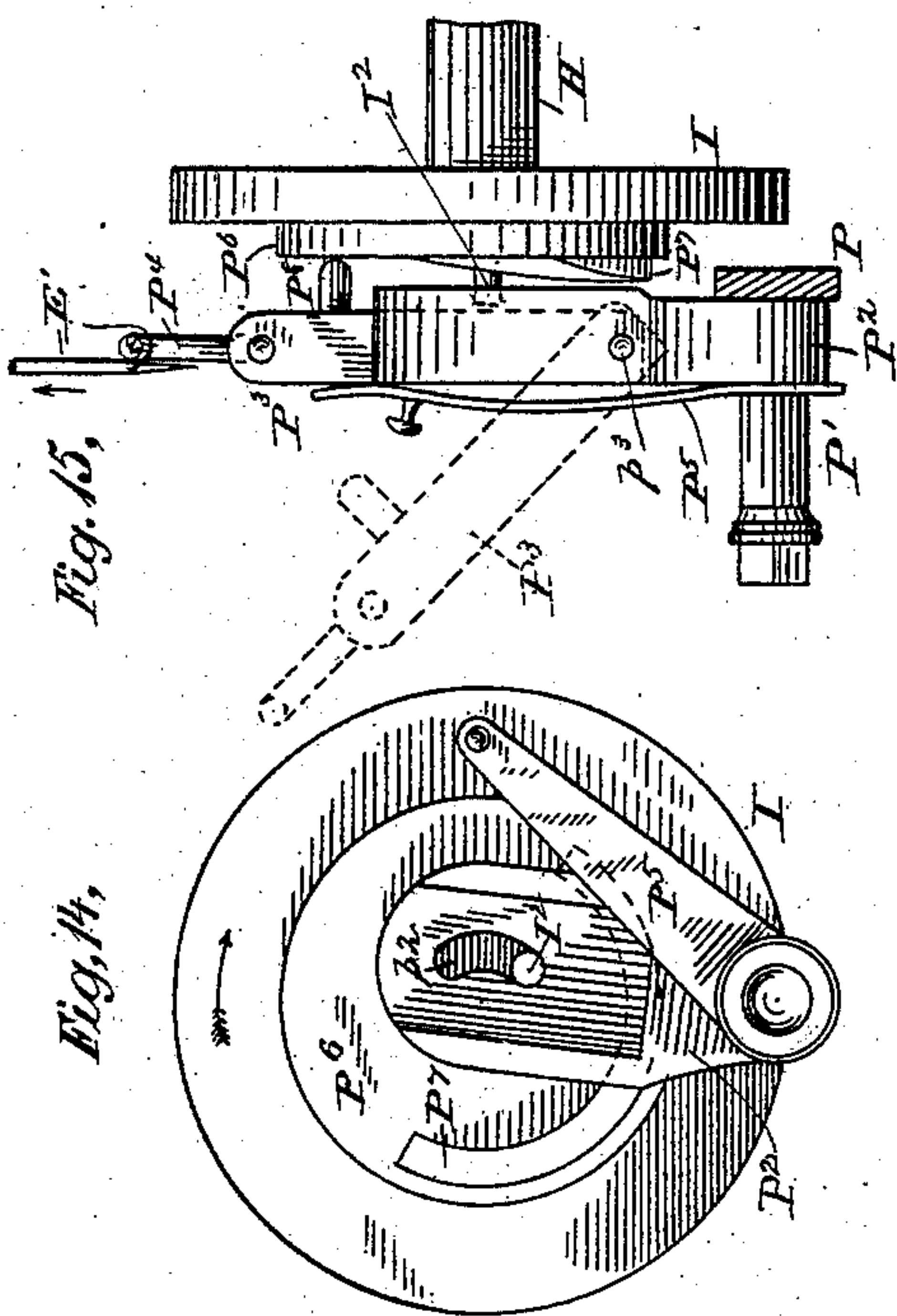
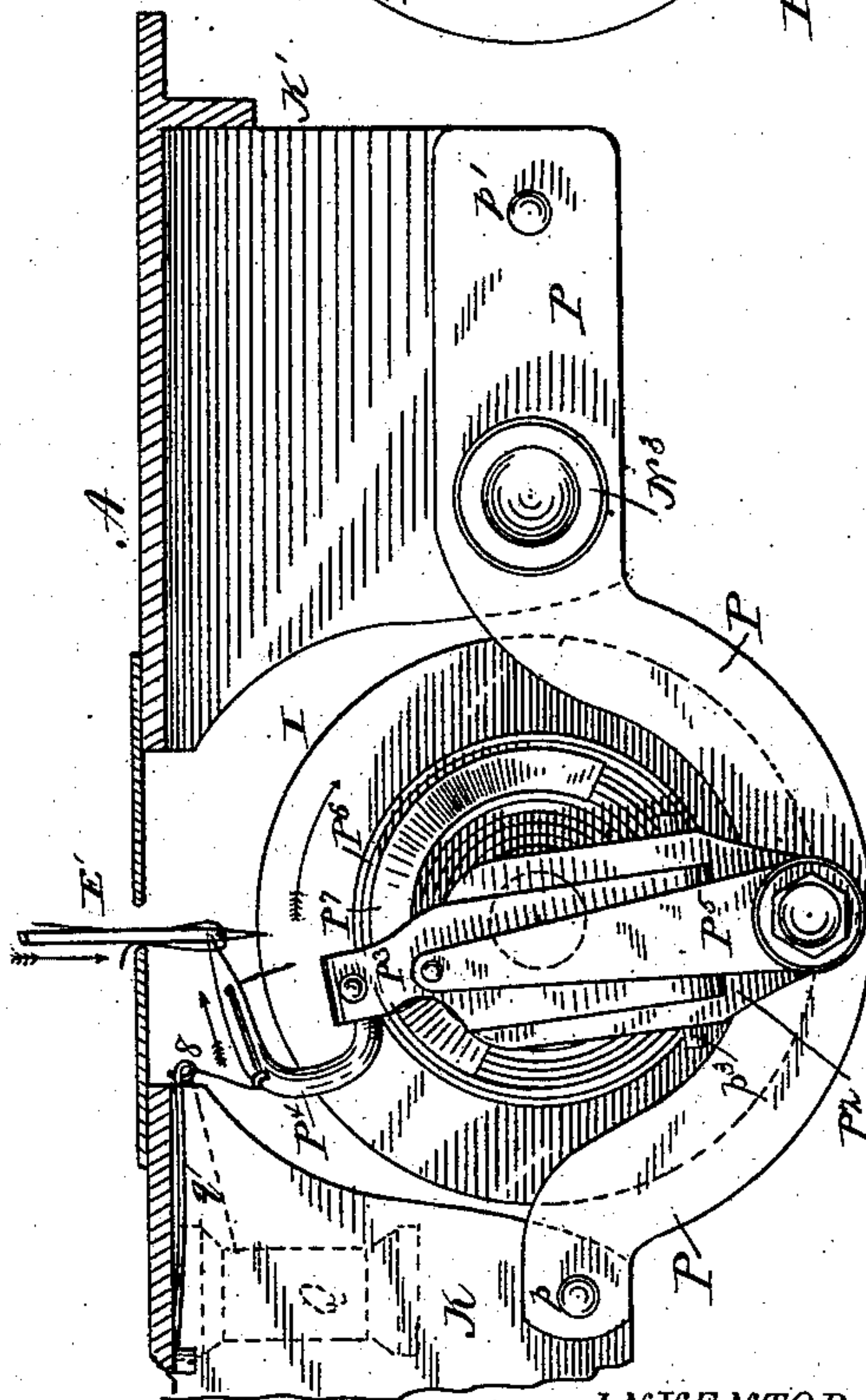


Fig. 13.



WITNESSES.

E. L. Grunman.
Henry Labort.

INVENTOR

John W. Post

(No Model.)

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Fig. 24.

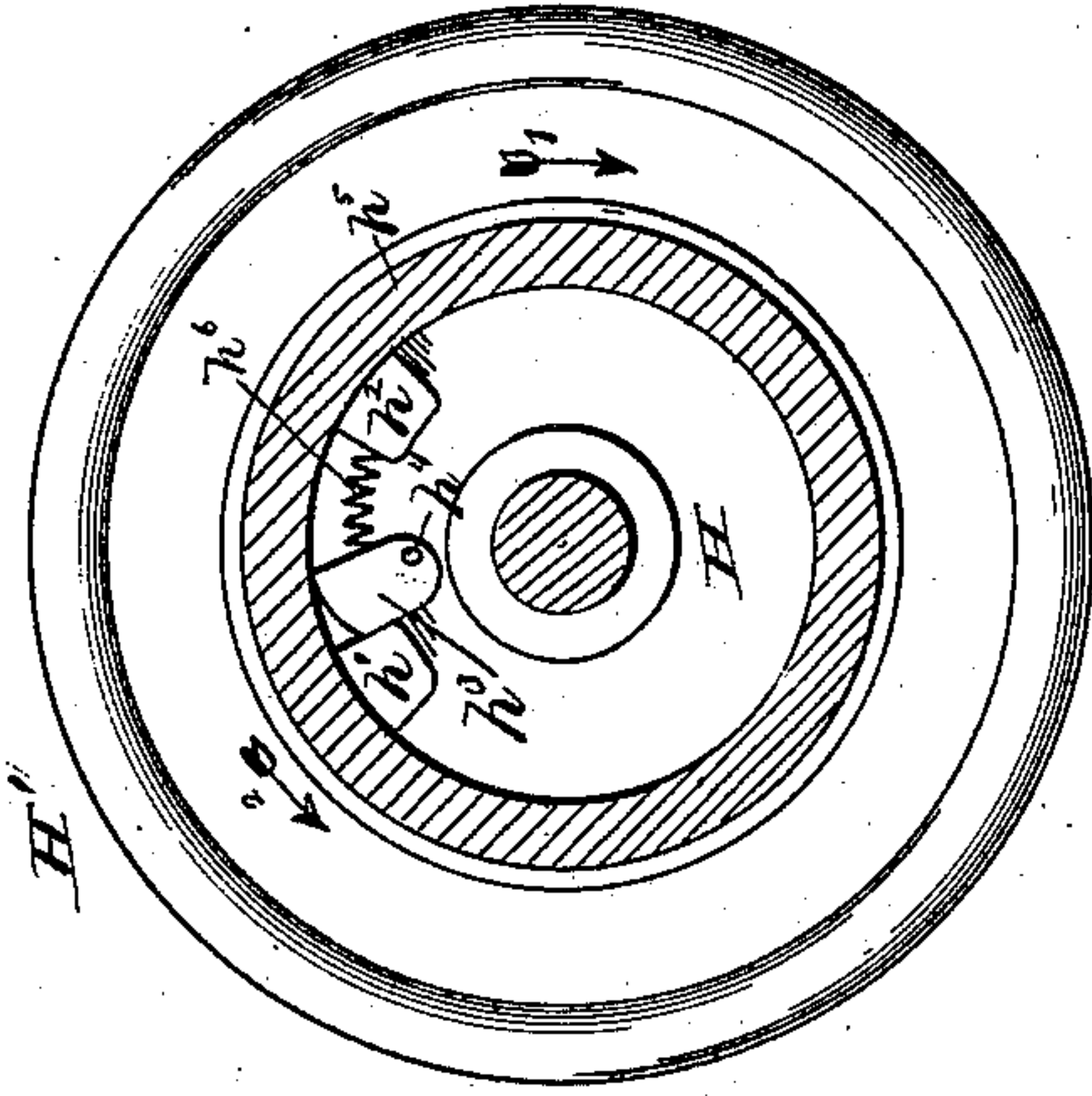


Fig. 27.

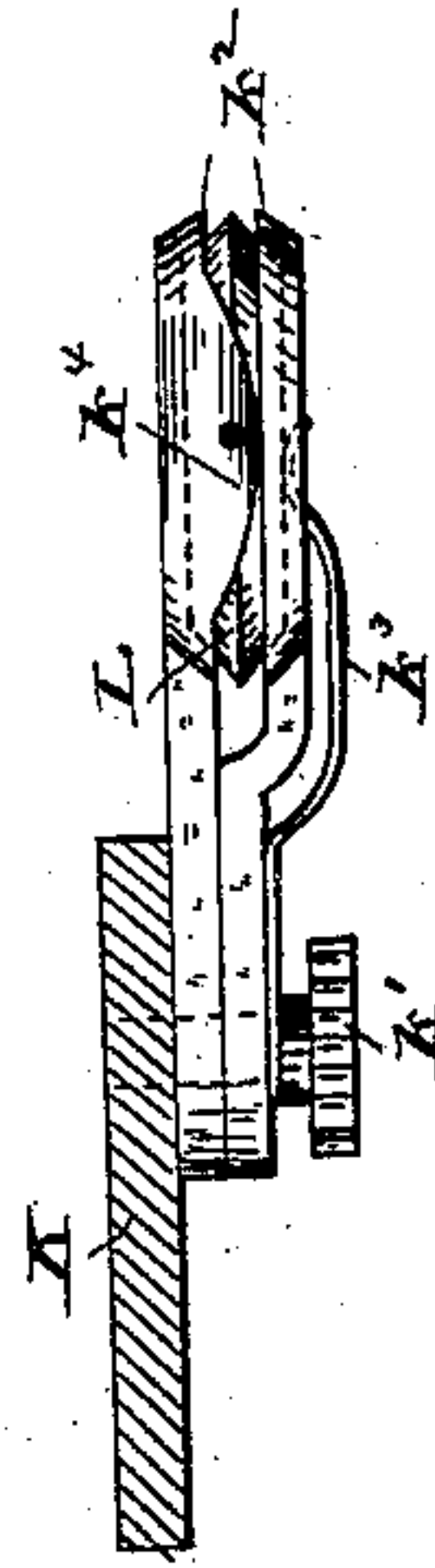


Fig. 23.

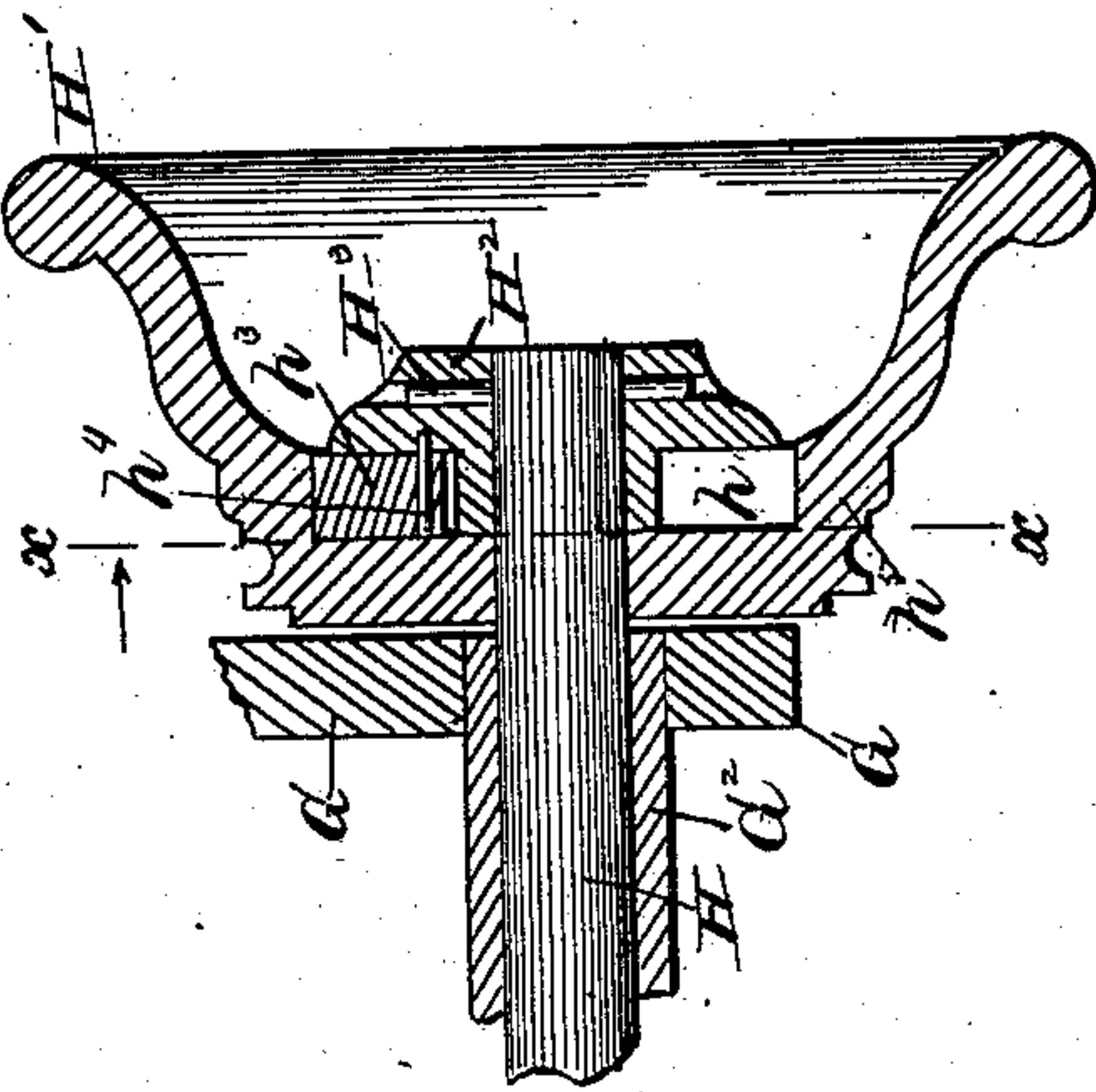
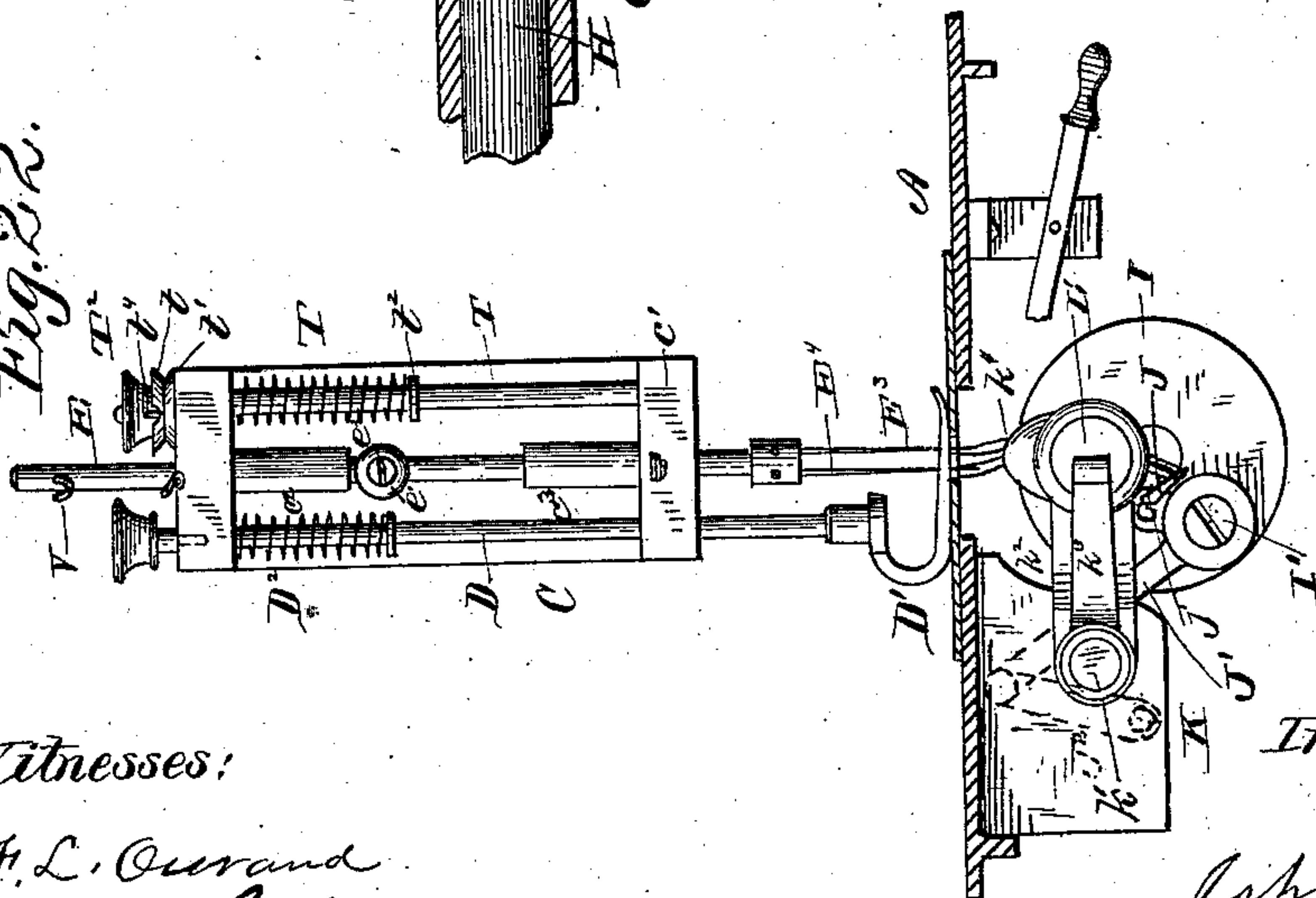


Fig. 22.



Witnesses:

J. L. Overland
Henry Calvert

Inventor:

John W. Post

(No Model.)

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No. 287,576.

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Fig. 26.

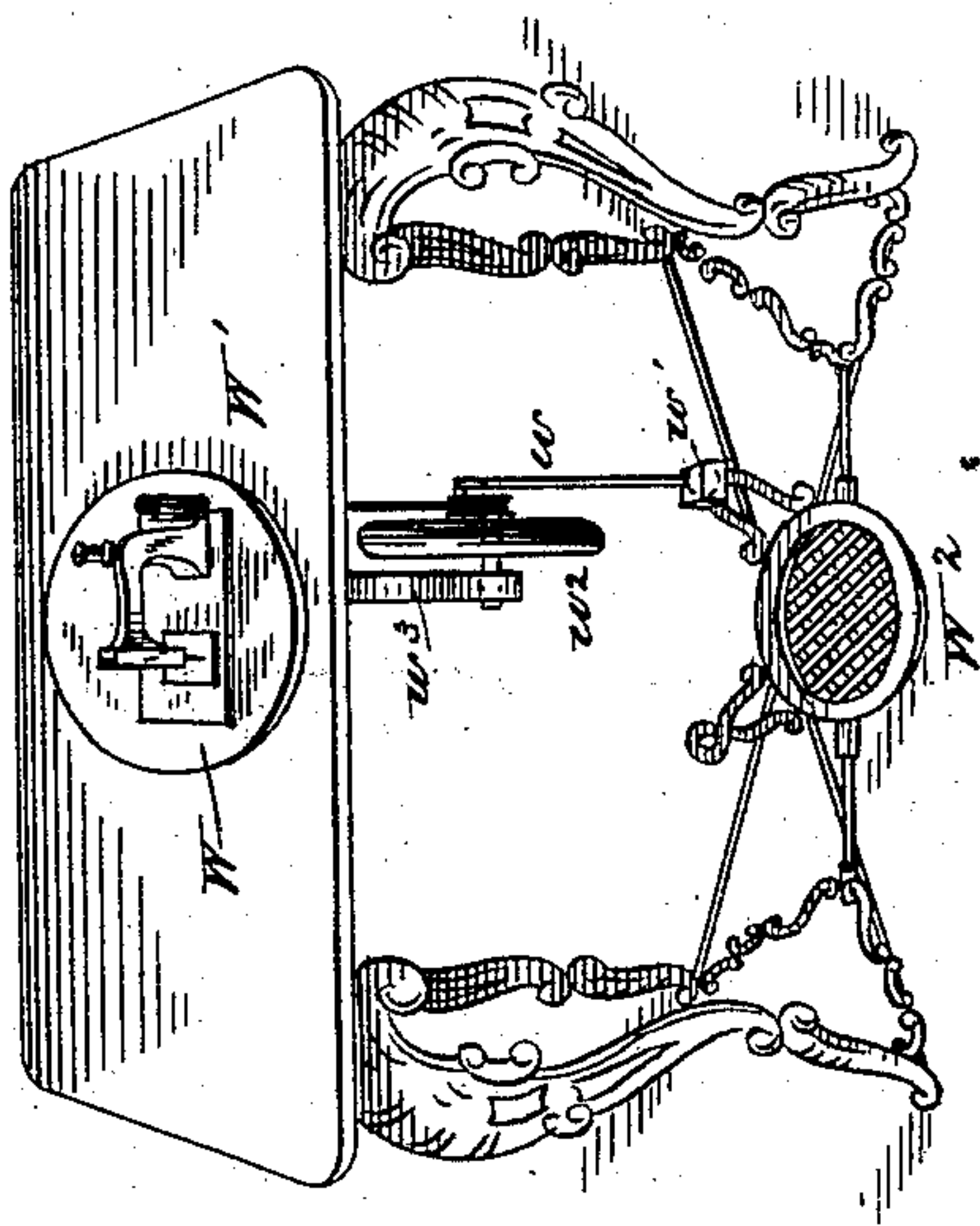
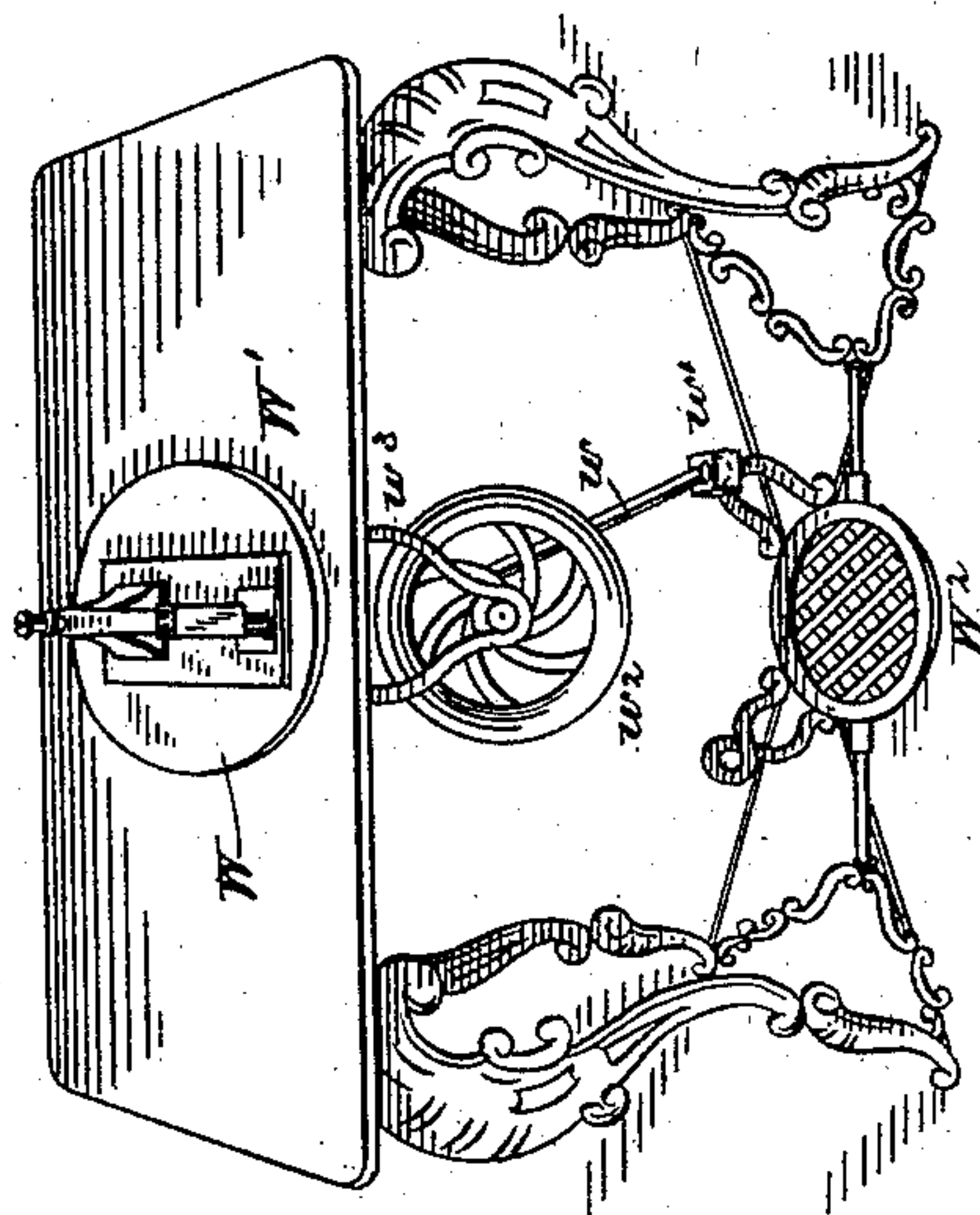


Fig. 25.



WITNESSES

E. L. Gruman
Henry Calver

INVENTOR

John W. Post

UNITED STATES PATENT OFFICE.

JOHN W. POST, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 287,576, dated October 30, 1883.

Application filed May 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. POST, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of sewing-machines capable, by means of interchangeable parts, of forming different kinds of stitches at the pleasure of the operator; and the object of my invention is to produce a machine adapted to sew a variety of stitches, and which is simple in construction, efficient in operation, and easily and quickly changed from one kind of stitch to another. I attain this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my machine provided with mechanism for forming the lock-stitch, the presser-foot being omitted for greater clearness. Fig. 2 is a front elevation of the head of the machine. Figs. 3, 4, and 5 are details, showing the connecting mechanism between the driving-shaft and the needle-bar. Fig. 5^a is a detail plan view of the tension device. Figs. 6 and 7 are partial front elevations of the lock-stitch mechanism. Figs. 8 and 9 are detail views of the bobbin-holder for the lower thread used in forming lock-stitches. Fig. 10 is a detail view of the feeding mechanism. Figs. 11, 12, and 12^a are partial front views of the chain-stitch mechanism. Fig. 11^a represents a portion of a needle-bar carrying two needles. Figs. 13 to 17, inclusive, are different views of the double-chain-stitch mechanism. Fig. 18 is an enlarged diagram representing a section of fabric sewed with the chain-stitch. Figs. 19, 20, and 21 are similar views of the double chain, double lock, and single chain stitches, respectively. Fig. 22 is a front elevation of my machine provided with mechanism for forming the double lock-stitch. Fig. 23 is a sectional view of the driving-wheel and its clutch mechanism. Fig. 24 is a sectional view at the line *x x*, Fig. 23, looking in the direction of the arrow adjacent to said line. Figs. 25 and 26 represent my machine mounted on a table, said figures being in per-

spective. Fig. 27 is a plan view of the bobbin-supporter and bobbin-case.

Like letters indicate similar parts in the different figures.

A indicates the bed or cloth plate of the machine, to which is secured in any proper manner the bracket-arm B, provided at its forward end with the head C, in which the presser-bar D and the needle-bar E have their bearings. The presser-bar is provided with an ordinary presser-foot, D', and the needle-bar with the usual eye-pointed needle, E', secured by a suitable set-screw, E².

Journaled in brackets G G', depending from the bed-plate A, is the driving-shaft H, provided with a driving fly and pulley wheel, H'. The pulley-wheel may be made separate from the fly-wheel, if desired; but I prefer to cast them in one piece, as shown. The wheel H' is mounted loosely on the shaft H, and is prevented from coming off from said shaft by a hub or collar, H², which is rigidly fixed to said shaft by a pin, H³, passing through said hub and shaft, or in any other suitable manner. The wheel H' is recessed on one face to form an annular flange, h⁵, and that part of the collar H² which is arranged within said flange is preferably formed with an annular recess, h, in which are secured two lugs, h' h². Between these two lugs, and adjacent to the lug h', is a dog, h³, pivoted on a pin, h⁴, entering the collar H². The dog h³ is pivoted somewhat eccentrically, as shown, for a reason which will presently appear. A light spring, h⁶, is arranged between the lug h² and the dog h³, said spring in the form shown having a bearing against said lug and pressing against said dog. Instead of the spiral spring shown, a U-shaped plate-spring might be employed, or a curved plate-spring could be substituted. In the last-named instance, said plate-spring could be rigidly secured at one end to the collar H² within the recess h, and in such case it is obvious that the lug h² might be dispensed with. With either form of spring, however, said spring would have a tendency to press the dog h³ against the lug h', in which position the outer face of the dog will be so far disengaged from the bearing-surface afforded by the interior of the flange h⁵ of the wheel H' that said dog will but just

barely touch said flange, and said wheel will then be free to rotate loosely on the shaft H. When the wheel H' is turned in the direction indicated by arrow 1, Fig. 24, there will be a slight frictional contact between the outer face of the dog h^3 and the interior of the flange h^5 , sufficient to overcome the very light stress of the spring h^6 , and the dog will then turn on its pivot, and, by reason of said dog being eccentrically pivoted, its outer face will be caused to bite against the inner surface of the flange h^5 , thus firmly engaging the wheel and hub or collar, and causing the driving-shaft H to turn with the wheel. If, however, the wheel be turned in the direction indicated by arrow 2, Fig. 24, the frictional contact of the dog and flange, aided by the spring h^6 , will turn said dog on its pivot, throwing it against the lug h' , in which position it just barely touches the inside of the flange h^5 , and it will be held against said lug h' by the spring h^6 while this direction of rotation of the wheel is maintained, thus permitting the wheel to run loosely on the shaft. The construction above described prevents the driving-shaft from being rotated backward or in the wrong direction, which might occasion some disarrangement of the various stitch-forming mechanisms employed in my machine. It also allows the wheel H' to be rotated without imparting motion to the other parts of the machine when it is desired to wind the bobbin of the lock-stitch mechanism.

Instead of making the collar H² with an annular recess and securing lugs in said recess, as above described, a recess of proper form and size to accommodate the pivoted dog may be cast or otherwise formed in one side only of said collar, the walls of said recess in such case serving as bearing or abutting surfaces for the dog and spring, thus obviating the necessity of providing separate lugs for this purpose.

When the pulley is made separate from the fly-wheel, the latter will be secured to the shaft H, either by being formed integral with the collar H² or in any other suitable manner. In such case the flange h^5 will be formed on the pulley, and the dog h^3 and its appurtenances will be arranged within said flange, as in the instance shown.

The hangers or brackets G G', by which the driving-shaft H is sustained, are provided with sleeves or bushings G², surrounding said driving-shaft, and by means of set-screws g entering said brackets said bushings may be compressed, when necessary, to compensate for wear, thus preventing any looseness of the shaft in its bearings.

To the driving-shaft H, near its rear end, is secured an eccentric, M, by means of a screw, g^3 , passing through a sleeve, G³, preferably formed integral with said eccentric. A strap, M', formed in one piece with or secured to a connecting-rod, M², surrounds said eccentric. The upper end of said connecting-rod is provided with a block, M³, made in two pieces, held together by suitable screws. Said block may be

divided either horizontally, as indicated in Fig. 3, or vertically. The block M³ is provided with a spherical socket, into which fits a ball, m , on the rear end of the needle-lever M⁵, pivoted at M⁶ within the bracket-arm B, the block M³ being constructed with a flaring slot, m' , to allow for the free movement of the needle-lever. The forward end of the needle-lever is forked, the prongs of the fork embracing a screw, e , entering the prongs of a forked bracket, e' , secured to the needle-bar E by a set-screw, e^2 . An adjusting-screw, m^2 , passes through the prongs of the fork on the needle-lever, and by means of said screw m^2 and the screw e the prongs of both forks may be properly adjusted to compensate for wear.

To the forward end of the shaft H is secured a crank-disk, I, into which are tapped two holes, i' i^2 , for the reception of the crank-pins I' and I², which actuate the devices co-operating with the needle in forming the different stitches. The crank-pin I', when screwed into the disk I, affords a pivotal bearing for the hook or looper J, which is in use when sewing lock-stitches. Said hook or looper J is formed integral with or is rigidly secured to an arm, J', pivoted to a link, J², which in turn is pivoted to a bracket, K, depending from the under side of the bed-plate of the machine. The bracket K is provided with a tapped hole, k , for the reception of a thumb-screw, k' , by which the bobbin-supporter k^2 is held in place. The bobbin-supporter k^2 consists of a lug or block branching into two arms having annular outer extremities, between which the bobbin-case is loosely held. Said bobbin-supporter is provided with a pivoted spring-arm, k^3 , which bears lightly on the bobbin, for the purpose of preventing too free rotation of the same in its case, and also for holding it in the case. The spring-arm k^3 , being pivoted on the screw k' , may be swung aside, to permit of the insertion or removal of the bobbin without necessitating the removal of the bobbin-case, if desired. Ordinarily, however, the bobbin-case will have to be removed when it is to be threaded. That one of the annular extremities of the bobbin-supporter which is nearest to the crank-disk I is furnished with a finger or guard, k^4 , which serves to keep the loop of needle-thread formed by and then disengaged from the hook or looper J out of the way of said hook or looper when it is moving forward to seize and expand the succeeding loop.

L is the bobbin case or holder, which is beveled both ways from the center to form a sharp edge, which will easily divide the loops of needle-thread. Said bobbin-case is furnished with a pin, l^4 , on which is journaled the bobbin L', carrying the lower or locking thread. The bobbin-case is provided with a tension-spring, l , the stress of which is regulated by means of an adjusting-screw, l' , the free end of said spring bearing on a lug or projection, l^2 . The extremity of the tension-spring is forked for the purpose of preventing lateral displacement of the bobbin-thread. The bobbin-case

is provided with a slot or channel, l^3 , leading from the bobbin-cavity to the periphery of the case. The thread passes from the bobbin through the slot or channel l^3 , over the lug or projection l^2 , and beneath the tension-spring l .

The operation of the above-described mechanism is as follows: Motion being imparted to the driving-shaft H, the eccentric M, by means of its connections with the needle-bar, imparts vertical reciprocating motion to the latter and to the needle. When the needle has descended to its lowest point and commenced its upward movement, it throws out a loop of thread, which is then seized by the looper or hook J, as indicated in Fig. 6. The needle continues its upward movement, while the looper or hook passes around and below the bobbin-case and bobbin, carrying with it the expanded loop of needle-thread, as represented in Fig. 7. It is obvious that when the looper or hook has passed the horizontal plane (indicated by the dotted line 1, Fig. 7) of the axis of the driving-shaft H, around which said looper or hook rotates, the said hook will be moving backward, or from its point, instead of forward, or toward its point, as it does when above said dotted line. This movement would result in the disengagement of the loop of needle-thread from the hook but for the little shoulder j , formed thereon. Thus the loop is carried past the center of the bobbin-case and bobbin, (indicated by the vertical dotted line 2, Fig. 7,) so that when it is pulled up or tightened into the cloth by the drawing of the thread, during the formation and expansion of the next succeeding loop it will be drawn entirely around the bobbin and the locking-thread running therefrom to the fabric. After the hook or looper J has passed the vertical line 2 in its continued revolution, it moves upward as well as backward, and, being properly tilted by means of its connections $J' J^2$ with the bracket K, it backs out of and thus becomes disengaged from the loop, which is left to be tightened, as just described. The loop, after being thus disengaged from the hook or looper, is held out of the way of the latter as it goes forward to seize the succeeding loop by the finger or guard k^4 , above described.

When it is desirable to sew a stronger seam than that afforded by the ordinary lock-stitch—as, for example, when sewing sails or other heavy work—the needle E (which is secured in a hole drilled concentric with the axis of the needle-bar) is removed, and two needles, $E^3 E^4$, Figs. 11^a and 22, are secured in holes formed on either side of the hole for the needle E, the said needles $E^3 E^4$ being secured to the needle-bar by set-screws $e^3 e^4$, Fig. 11^a, or in any other suitable manner, as by a single set-screw and clamping-jaw. It will be observed that these needles $E^3 E^4$ are arranged one before the other in the line of the movement of the work. By using two needles instead of one, the double lock-stitch represented in Fig. 20 will be formed, the hook or looper carrying the threads

of both needles around the locking-thread with the same facility that it carries the thread of a single needle around said locking-thread.

The double lock-stitch, in addition to the uses above suggested, may be employed in embroidering or ornamenting fabrics—a very pleasing effect, much resembling a tri-colored cord, being produced by using three threads of different colors.

When sewing with two needles, the feed will be so adjusted that the work will be moved at each stitch a distance which will be equal to half the distance between the two needles; or, in other words, the needles will be arranged one before the other in the line of the feed a distance apart equal to twice the length of the stitches to be sewed, as determined by the length of the feed. Thus the hinder needle will, at each descent, pierce the fabric being sewed at a point between the two punctures made at the previous descent of the two needles, and a double seam of needle-thread, interlocked by a single bobbin-thread will be produced. If desired, more than two needles may be employed in a similar manner with a single looper and locking-thread; and when it is necessary to add to the strength of the seam, or to increase the ornamental effect when embroidering, the locking-thread may be much larger and stronger than the needle-threads, or may even be a small cord of variegated colors, or otherwise.

If it is desirable to vary the lengths of the stitches when sewing with two needles, interchangeable needle-bars, or needle-carrying blocks having the needle-holes at varying distances apart, may be furnished.

When it is necessary to change from lock to chain stitches, the bobbin-supporter, with the bobbin-case and bobbin, is removed by taking out the thumb-screw k' . The screw crank-pin I' is then removed, and the looper $J J'$, being thus released from the disk I, may be thrown back to the position indicated in dotted lines in Fig. 6, where it will be out of the way of the chain-stitch looper; or, instead of thus removing the bobbin-supporter and bobbin and throwing back the looper, the bracket K may be secured to the bed-plate A by a vertically-arranged screw-pin, which may be slightly loosened to permit said bracket to be turned horizontally on said screw-pin as a pivot, thus swinging the parts attached thereto outward away from the disk I and the chain-stitch looper. The crank-pin I^2 will then be inserted in the hole i^2 of the disk I, when the machine will be in readiness to apply the chain-stitch looper.

N is the vibratory chain-stitch looper, one arm of which is constructed with a cam-slot, N' , of the proper form to give the requisite movements to said looper when engaged by the rotary crank-pin I^2 . The looper N is pivoted to a detachable arm, N^2 , by a screw-pin, n , the said arm being secured to the bracket K' by the thumb-screw N^3 , which enters a hole tapped

in said bracket. The arm N^2 is steadied by dowel-pins n' engaging suitable recesses in the bracket K' .

The operation of the chain-stitch mechanism is as follows: When the needle has descended to its lowest point and has commenced to rise, the loop of thread then thrown out by said needle will be seized by the vibrating looper, by which it will be held until the needle descends at the formation of the next stitch, carrying the second loop through the first loop. The looper moves backward as the needle is coming down, so that the first loop will be held in proper position for the needle to pass the second loop through the first, the looper then backing out of or casting off the first loop. As the needle begins to rise the looper again moves forward, seizing and holding the second loop and drawing it through the first. These operations are repeated indefinitely during the formation of the chain-stitches shown in Fig. 21, the new loops being successively drawn through the old ones. Two needles may also be employed with the chain-stitch looper, in which case a double series of chain-stitches will be formed very much like two seams of single chain-stitches, one sewed over the other; but with two needles and needle-threads and a single looper, the loops of one needle-thread will be of double length. By these means a strong and close seam useful in the manufacture of grain-bags and some other articles will be formed. This seam can also be used for embroidering, as referred to in connection with the double lock-stitch, by employing threads of different colors.

The double chain-stitch, (shown in Fig. 19,) also known as the "Grover & Baker," "double-loop," and "embroidering" stitch, is formed by means of the mechanism represented in Figs. 13 to 17, inclusive. When either of the looping mechanisms above described has been removed, a supporting-plate, P , is secured to the brackets $K K'$ by means of the thumb-screw N^3 , used for securing the arm which sustains the chain-stitch looper. Dowel-pins $p p'$, which enter holes formed in the brackets $K K'$, assist in steadying the supporting-plate P . To the plate P is secured a pin, P' , on which is pivoted an arm, P^2 , provided with a curved slot, p^2 , engaged by the crank-pin I' of the disk I . To the arm P^2 is pivoted, by means of a pin, p^3 , the looper-carrier P^3 , to which is secured the double-chain-stitch looper P^4 . The looper-carrier, being thus pivoted to the arm P^2 , is capable of being vibrated in a plane at right angles to the plane of the movement of the said arm. To the crank-disk I is removably secured, by means of a screw and one or more dowel-pins, the cam-disk P^6 , provided with a segmental face-cam, P^7 , which latter, in its revolution, engages a pin, P^8 , secured to the looper-carrier P^3 , thus moving said looper-carrier outward in opposition to the action of a spring-arm, P^5 , pivoted on the pin P' , and vibrating with the

arm P^2 and looper-carrier P^3 . In any suitable position beneath the bed-plate is supported a spool, Q , from which the lower or inter-looping thread passes through an eye, 8, in a light take-up spring, q' , and thence through eyes in the looper P^4 , as in the well-known Grover & Baker machine.

The double chain-stitch shown in Fig. 19 is formed by the mechanism just above described in substantially the same manner as in the Grover & Baker machine above referred to. The needle descends to its lowest point, and as it begins its upward movement the looper, receiving its movement from the crank-pin I' , working in the curved slot p^2 , moves forward and seizes the loop of needle-thread, as indicated in Fig. 15. As the needle continues its ascent the face-cam P^7 comes in contact with the pin P^8 on the looper-carrier P^3 , and swings the looper-carrier and looper slightly outward to the position shown in Fig. 17, so that when the needle again descends it passes between the looper and the thread of the latter, thus carrying a loop of the needle-thread through a loop of the looper-thread. The looper then retreats, backing out of or casting off the loop of the needle-thread, and as soon as the face-cam P^7 has passed beyond the pin P^8 the looper returns to its first position under the stress of the spring-arm P^5 , which presses against the looper-carrier. The needle has in the meantime continued to descend, carrying a new loop through the old loop of needle-thread cast off from the looper, and as said needle again begins to rise the looper again moves forward and seizes the new loop of needle-thread and draws it through the old one. Thus the operation continues, the loops of needle and looper threads being passed alternately through each other and tightened into the fabric by the upward and backward movements of the needle-bar and looper, respectively. When the looper is to be threaded, the spring-arm P^5 is swung aside, as shown in Fig. 16, thus permitting the looper-carrier and looper to be turned outward, as indicated by dotted lines in Fig. 15, in which position the looper will be readily accessible to the operator.

It will be observed from the drawings and the foregoing description that all of the loopers are so arranged relative to the needle that they take the loops of thread from the inside of said needle, or from the side thereof which is nearest to the crank-disk I . This arrangement of loopers relative to the needle insures compactness in the construction of the operating mechanism of said loopers, and in the case of the lock-stitch looper it permits of the use of a shorter looping-hook, and consequently a hook which may travel in a circle of lesser diameter than a hook which is arranged to co-operate with the needle from the outside thereof, as in the machine formerly known as the "Elliptic."

The feeding mechanism, which is shown in

Figs. 1 and 10, consists of an eccentric, R, mounted on the driving-shaft H, said eccentric being surrounded by an eccentric-strap, R', formed integral with or secured to a feed-lever, R², the upper end of which has an angular offset or projection carrying the feed-dog or feeding-surface, R³, which latter is preferably slotted for the passage of the needle, so that it may engage the fabric on both sides thereof. The lever R² is provided with a slot, r, in which is arranged a pin, r', carried by an adjusting-lever, R⁴, pivoted at r² to a lug, R⁵, depending from the bed-plate A. The lever R⁴ is provided with a handle, R⁶, by means of which it may be turned on the pivot r², thus adjusting the pin r', which serves as a fulcrum for the lever R² nearer to or farther from the eccentric R, and thereby regulating the throw of the feed-dog R³ in a well-known manner. Adjacent to the handle R⁶ of the regulating-lever R⁴ is arranged an index-plate, R⁷, by which the proper position of said lever to secure any desired length of stitch may easily be determined. The lever R⁴ is slightly resilient, and is arranged to have, when in its normal position, a slight pressure against the index-plate R⁷, and said lever may be provided with a holding-pin entering recesses in the index-plate, as indicated in Fig. 10. By this construction the regulating-lever will be maintained against accidental displacement in any position to which it may be adjusted.

Instead of the construction just above described, the regulating-lever may be provided with a sharpened lug or projection and the index-plate with a series of notches for securing the said lever in place; or, if desired, the reverse of either of these constructions may be employed—that is, the index-plate may have a series of projections engaging a recess in the regulating-lever.

Instead of slotting the feed-lever and arranging a pin in said slot to serve as a fulcrum for said lever, it is obvious that a sleeve surrounding said feed-lever and swiveled to the regulating-lever may be employed. In such case the feed-lever, in its up and down movements, will slide through said sleeve, and the latter will turn to permit of the oscillatory movements of the lever.

From the foregoing description it will be readily understood that as the eccentric R rotates with the shaft H the feed-dog R³ on the upper end of the feed-lever R² will be caused to travel in an elliptical path, moving upward to engage the fabric being sewed, then forward to carry the fabric along under the needle, next descending to be disengaged from the fabric, and then returning to its first position. It will be observed that all of these movements are positive, and a strong silent feed is thus secured.

The tension device for the needle-thread consists of a pair of disks, t t', through which passes a rod, T, arranged vertically in the head C of the machine. The said rod T passes through the upper cross-bar, c, of the head C,

and enters loosely into a socket formed in the lower cross-bar, c', of said head. To the rod T is secured a collar, t², and between said collar and the cross-bar c is arranged a spiral spring, T'. The upper end of the bar T is threaded, and on said threaded portion is arranged a regulating thumb-nut, T², bearing directly on the disk t, or on an intermediate washer placed loosely on the bar T, and by turning said thumb-nut in either direction the stress of the spring T', which has a tendency to draw the bar T downward, and thus compress the disks together between the thumb-nut and the cross-bar c, may be adjusted, and the tension on the thread passing between said disks thereby regulated. The upper disk, t, is provided with two notches in its opposite edges, in which notches are arranged two pins, t³ t⁴, secured to the lower disk, t', said pins projecting slightly above the top of the upper disk. The needle-thread u, which is carried by a spool, U, sustained by a spool-post, U', on the bracket-arm B, is drawn first into one of the notches of the disk t, where it is held by the pin t³. Next it is drawn partly around the bar T, between the disks t t', and into the other notch of the disk t, where it is likewise held by the pin t⁴. The thread is then passed through suitable guide-eyes, secured to the head C and the needle-bar E, to the eye of the needle. When two needles are to be used, a spool-pin of sufficient length to accommodate two spools will be provided; or separate pins for each spool may be mounted on the bracket-arm B. In such case both threads can be subjected to the action of the same tension device, from which they may pass through the same or through separate guide-eyes to the needles. When lock or double lock stitches are being formed, the loops of needle-thread are drawn up and tightened by the formation and expansion of the succeeding loops, as hereinbefore described; but when chain or double chain stitches are being formed the needle-thread is passed from the tension device through a loop or guide-eye, V, attached to the needle-bar, the thread running thence through the guide-eyes on the front of the head C to the needle. Thus when the thread passes through the loop V said loop serves as a take-up to tighten the thread at each stitch as the needle-bar rises.

To steady the needle in its vertical reciprocations, and to afford proper bearings for the same, the cross-bars c c' of the head C, through which the needle-bar passes, are provided with sleeves or bushings c² c³, the former preferably extending below the upper cross-bar, c, and the latter projecting upward from the lower cross-bar, c'. If desired, however, said sleeves may extend above and below both of said cross-bars; but I do not claim this feature in this case, as I reserve the right to make it the subject-matter of a separate application.

It has been found that it is sometimes desirable to place the sewing-machine in differ-

ent positions on the table, for the purpose of enabling the operator to sit in different positions, or to permit one person to actuate the treadle while another guides and handles the work. To this end I have shown (see Figs. 25 and 26) my machine mounted on a circular support or stand, W, sustained in a circular opening in the table W' by means of an annular flange or lip in the lower side of said opening. The pitman *w*, which conveys motion from the treadle W² to the driving-wheel *w*², is connected to said treadle by a ball-and-socket joint at *w*'. The driving-wheel *w*² is journaled in a bracket, *w*³, depending from the circular stand W, and said bracket and driving-wheel are therefore moved with said stand as the latter and the sewing-machine secured thereto are turned in different positions, while the pitman *w* and treadle W² retain their operative connection in whatever position the sewing-machine may be placed by virtue of their ball-and-socket connection. As the right to make this feature the subject-matter of a separate application is hereby expressly reserved, no claim thereto is made in this case.

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

1. The combination of a needle-bar, a forked bracket secured thereto, and a pin passing through said bracket, with a needle-lever having its ends arranged in the fork of said bracket, the outer end of said needle-lever being forked to embrace the pin passing through the fork of said bracket, substantially as set forth.

2. The combination of a needle-bar, a forked bracket secured thereto, a screw-pin passing through the fork of said bracket and adapted to compress the same, with a needle-lever extending into the fork of said bracket and having its end forked to embrace said pin, and means for compressing the fork on the end of the needle-lever to compensate for wear, substantially as set forth.

3. The combination, with the driving-shaft having an eccentric thereon, a connecting-rod adapted to be operated by said eccentric, and a block secured to said connecting-rod, said block being formed in two portions and provided with a spherical socket and a flaring opening or slot extending outward from said socket, of a needle-lever having at its end a ball fitting said spherical socket, substantially as set forth.

4. The combination, with a needle-bar carrying two needles, mechanism for operating said needle-bar, a bobbin-supporter having a finger or guard, as described, and a bobbin-case and bobbin sustained by said bobbin-supporter, of a rotary hook or looper adapted to carry the threads of both needles around said bobbin-case and bobbin, substantially as set forth.

5. The combination, with the bobbin-case provided with an interior cavity for the bobbin, and a thread-passage running from said cavity to the periphery of said case, of a ten-

sion-spring arranged on the outside of said bobbin-case, and a lug or projection on which the end of said tension-spring bears, substantially as set forth.

6. The combination, with a needle-bar carrying several needles, of a stationary bobbin-case and bobbin and a rotary hook serving to carry the threads of said needles around said bobbin-case and bobbin, substantially as set forth.

7. The combination, with a needle-bar carrying several needles, arranged one before the other in the line of the movement of the work, of a stationary bobbin-case and bobbin, a rotary hook serving to carry the threads of said needles around said bobbin-case and bobbin, and a feeding mechanism serving to move the fabric being sewed a suitable distance to enable the rear needle to pierce the fabric between the punctures made by the needles at their previous descent, substantially as set forth.

8. The combination, with a needle-bar carrying several needles, a stationary bobbin-case and bobbin, and a rotary hook serving to carry the threads of said needles around said bobbin-case and bobbin, of a feeding mechanism consisting of an eccentric mounted on the driving-shaft, a strap surrounding said eccentric, a feed-lever secured to or formed integral with said strap, and carrying at its free end a suitable feeding-surface, and means for regulating the throw of said feeding-surface, substantially as described.

9. The combination, with a needle-bar carrying several needles, a stationary bobbin-case and bobbin, and a rotary hook serving to carry the threads of said needles around said bobbin-case and bobbin, of a feeding mechanism consisting of an eccentric mounted on the driving-shaft, a feed-lever connected with said eccentric, and having at its free end a feeding-surface, and an adjustable lever carrying a fulcrum for said feed-lever, substantially as set forth.

10. The combination, with a needle and mechanism for actuating the same, of a vibratory looper adapted to co-operate with said needle in forming chain-stitches, said looper being pivoted near its center, and having one of its arms formed with a curved slot and the other with a looping-hook, substantially as set forth.

11. The combination, with a vibratory chain-stitch looper pivoted near its center, and having a curved slot in one of its arms and a looping-hook on the other, of a rotary disk carrying a crank-pin adapted to work in the slotted arm of the looper for operating the same, substantially as set forth.

12. The combination, with the bed-plate having a bracket depending therefrom, an arm removably secured to said bracket, and a vibratory chain-stitch looper pivoted to said arm, one arm of said looper being provided with a curved slot and the other with a loop-

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ing-hook, of a rotary disk carrying a crank-pin adapted to work in the slotted arm of said looper, substantially as set forth.

13. The combination, with a vibratory double-chain-stitch looper adapted to carry an inter-looping thread, of a supporting-plate to which said looper is pivoted, and means for detachably securing said supporting-plate to the bed-plate of the machine, as set forth.

14. The combination, with a vibratory double-chain-stitch looper adapted to carry an inter-looping thread, of a supporting-plate to which said looper is pivoted, two brackets depending from the bed-plate of the machine for sustaining said supporting-plate, and means for detachably securing said supporting-plate to said brackets, substantially as set forth.

15. The combination, with a vibratory double-chain-stitch looper, of a supporting-plate provided with a pin, an arm pivoted on said pin, a looper-carrier pivoted in said arm, and mechanism for vibrating said looper-carrier in two planes which are at right angles to each other, substantially as set forth.

16. The combination, with a vibratory double-chain-stitch looper, of a supporting-plate provided with a pin, an arm pivoted on said pin and provided with a curved slot, a rotary crank-pin working in said slot and serving to vibrate said arm, a looper-carrier pivoted in said arm, and mechanism for vibrating said looper-carrier at right angles to the direction of the vibration of said arm, substantially as described.

17. The combination, with a vibratory double-chain-stitch looper, of a supporting-plate provided with a pin, an arm pivoted to said pin and having formed therein a curved slot, a rotary crank-pin working in said slot, a looper-carrier pivoted to said arm, a pin on said looper-carrier, a rotary face-cam adapted to engage said pin at proper intervals, and a pivoted spring-arm serving to move said looper-carrier in a direction opposite to that in which it is moved by said face-cam, substantially as set forth.

18. The combination, with a vibratory double-chain-stitch looper, of a supporting-plate provided with a pin, an arm pivoted to said pin, mechanism for vibrating said arm, a looper-carrier pivoted to said arm, a pin on said looper-carrier, a rotary face-cam adapted to engage said pin at proper intervals and move it in one direction, and a pivoted spring-arm serving to move said looper-carrier in a direction opposite to that in which it is moved by said face-cam, substantially as described.

19. A tension device consisting of the combination of a pair of disks, one of which is provided with two oppositely-arranged pins and the other with two notches in its opposite edges somewhat larger than said pins, a spindle or bar on which said disks are mount-

ed, and means for compressing them together, substantially as set forth.

20. A tension device consisting of the combination of a pair of disks, one of which is provided with two oppositely-arranged pins and the other with two notches in its opposite edges somewhat larger than said pins, a spindle or bar on which said disks are mounted, means for compressing said disks together, and means for varying the pressure of said disks, substantially as described.

21. The combination, with the head C, having the cross-bars *c* and *c'*, of the bar T, passing through a hole in the cross-bar *c* and entering a socket in the cross-bar *c'*, a pair of tension-disks mounted on said bar, and means for compressing said disks together and for varying their pressure, substantially as set forth.

22. The combination, with the head C, having the cross-bars *c* and *c'*, of the bar T, supported in said cross-bars, and having mounted thereon a pair of tension-disks, a collar, *t*², secured to said bar T, a spring, T', arranged on said bar between said collar and the cross-bar *c*, and a thumb-nut, T², for adjusting the pressure of said spring, substantially as set forth.

23. The combination, with the driving-shaft, of a pulley-wheel mounted loosely thereon, and having an interior bearing-surface, a collar fixed to said shaft, and provided with a recess having two abutting surfaces, a pivoted dog connected to said collar and arranged within said recess, and a spring, also arranged within said recess and bearing against said dog and one of said abutting surfaces, whereby when said wheel is turned in one direction the dog will be engaged therewith and the wheel and shaft will be caused to rotate together, but when said wheel is turned in the opposite direction the dog will be disengaged therefrom and the wheel will be free to run loosely on the shaft, substantially as set forth.

24. The combination, with the driving-shaft, of a pulley-wheel mounted loosely thereon, and recessed on one face to form an annular flange, a collar fixed to said shaft and provided with an annular recess, two lugs fixed to said collar within said recess, a dog pivoted to said collar within said recess and between said lugs, and a spring arranged to bear against said dog and one of said lugs, whereby said wheel will be caused to rotate said shaft when turned in one direction, but will be enabled to run loosely on said shaft when turned in the opposite direction, as set forth.

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

JOHN W. POST.

Witnesses:

VINTON COOMBS,
HENRY CALVER.