No. 705,333. Patented July 22, 1902.

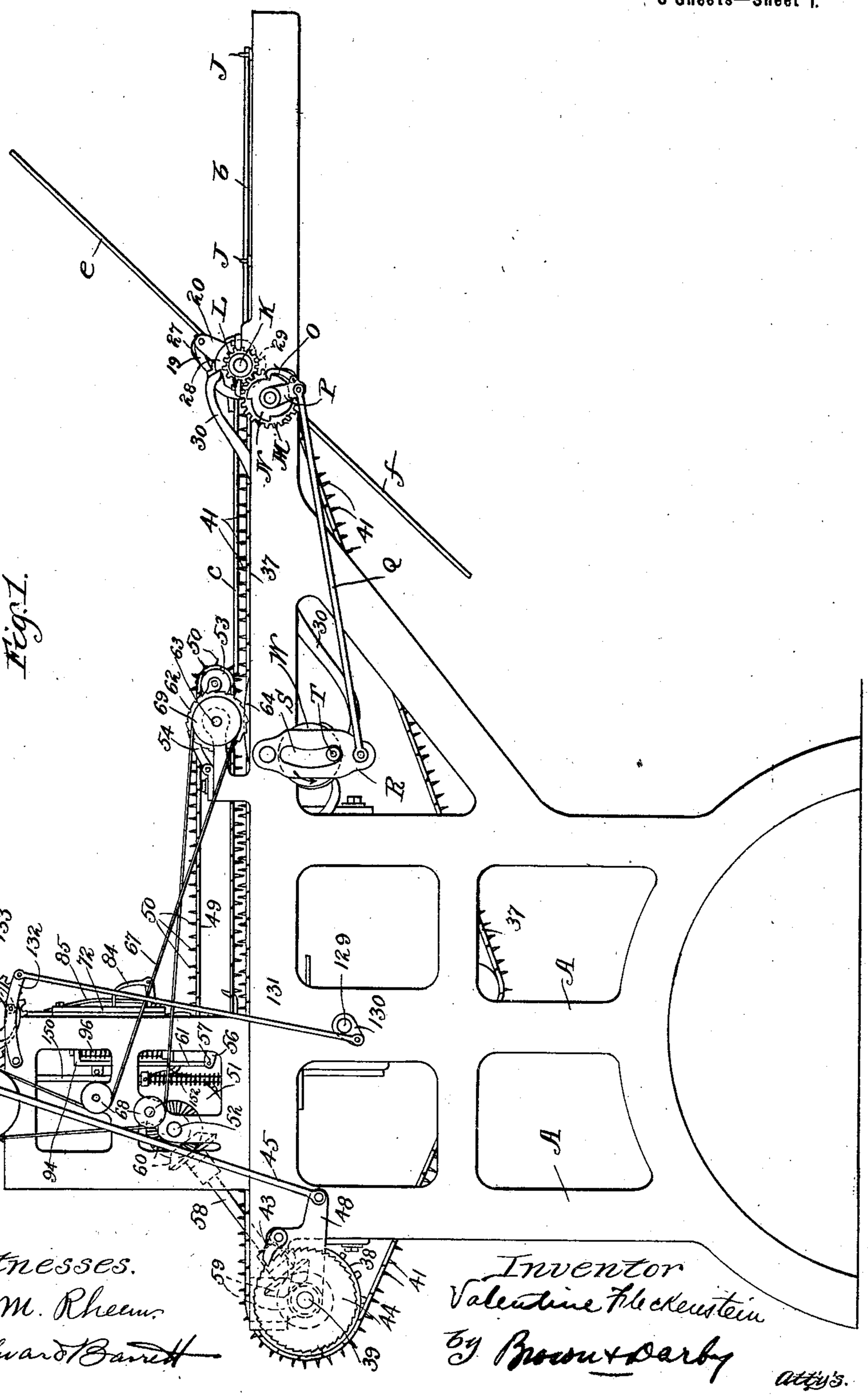
V. FLECKENSTEIN.

MACHINE FOR MAKING MATS FOR BOTTLE COVERS, &c.

(Application filed Apr. 5, 1899.)

(No Model.) 8 Sheets—Sheet 1.

Fig. 1.



Witnesses.
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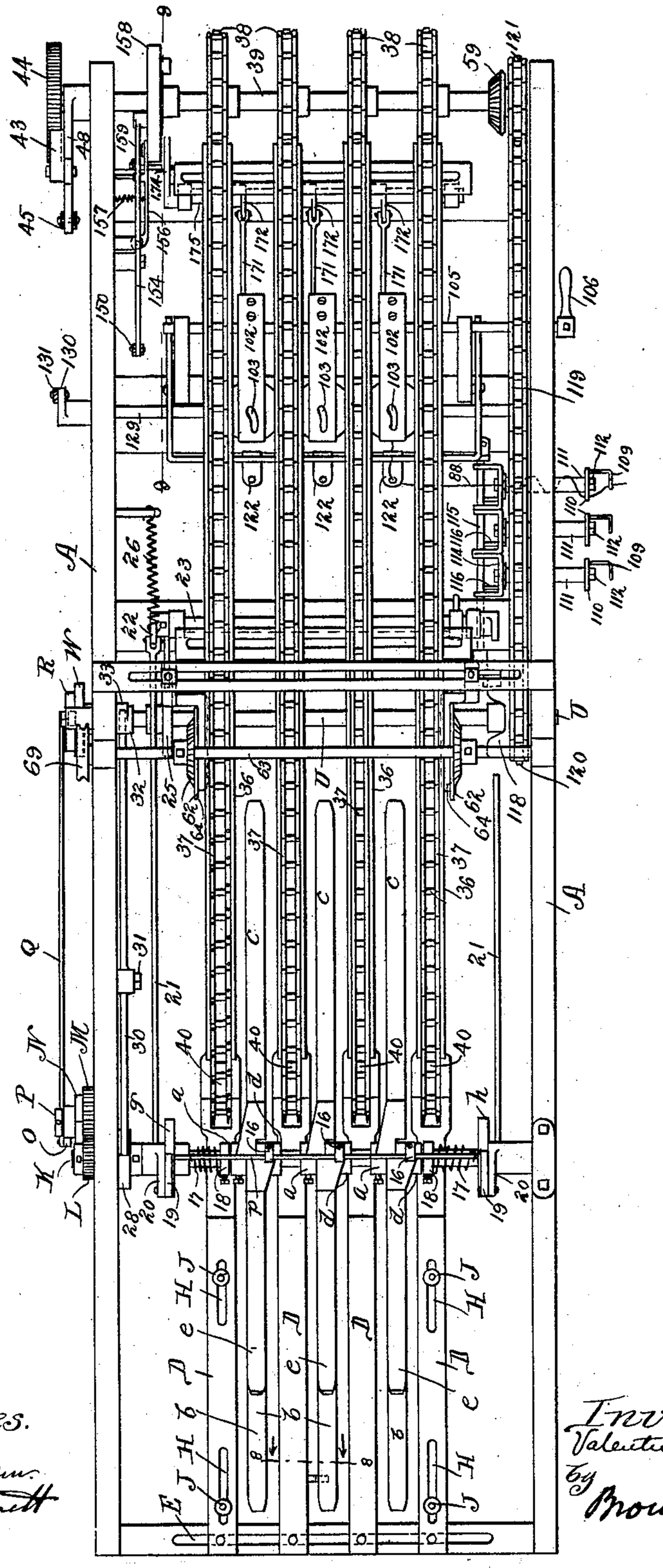
Fig. 2.



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(No Model.) 8 Sheets—Sheet 3.

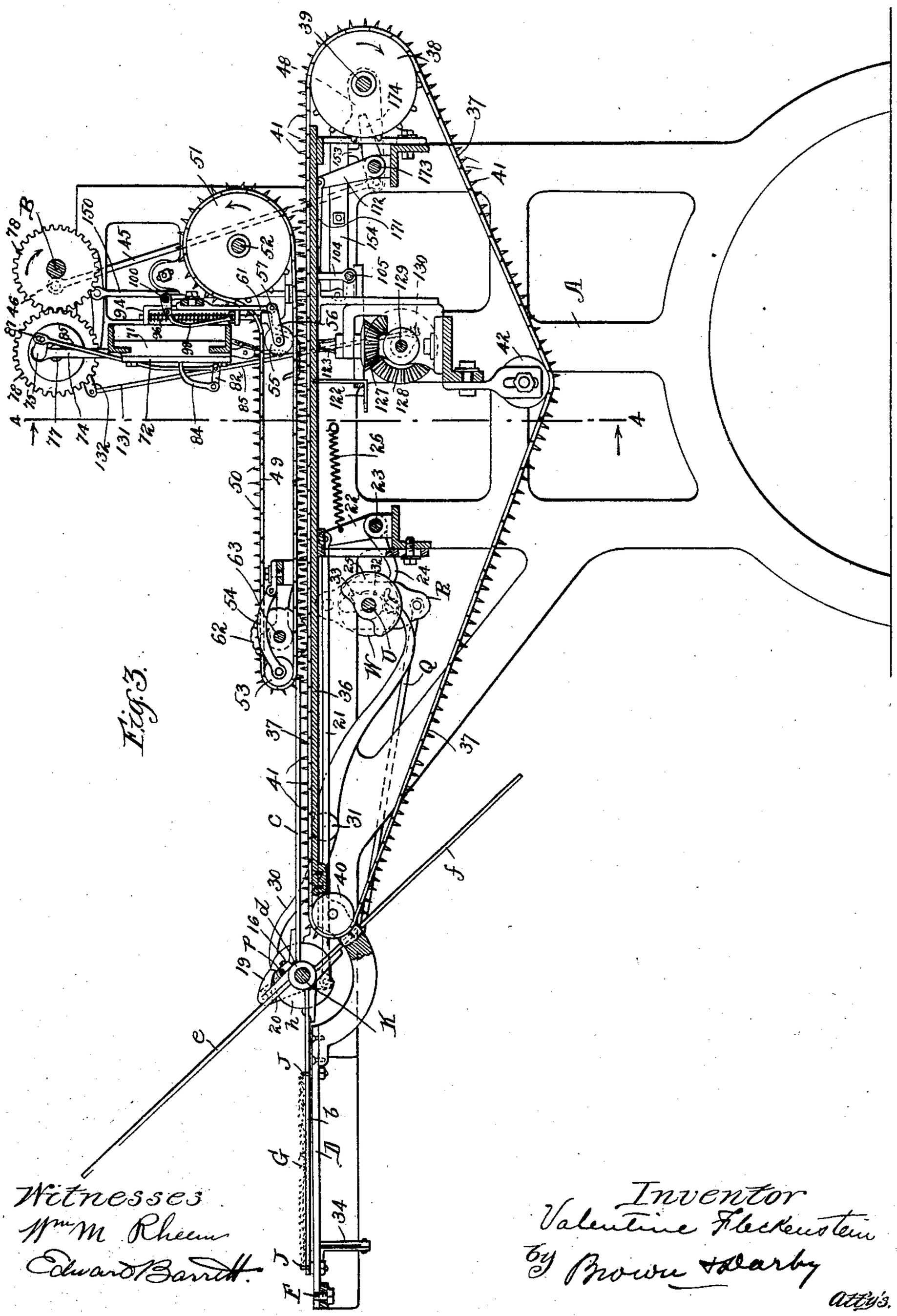

Fig. 3.

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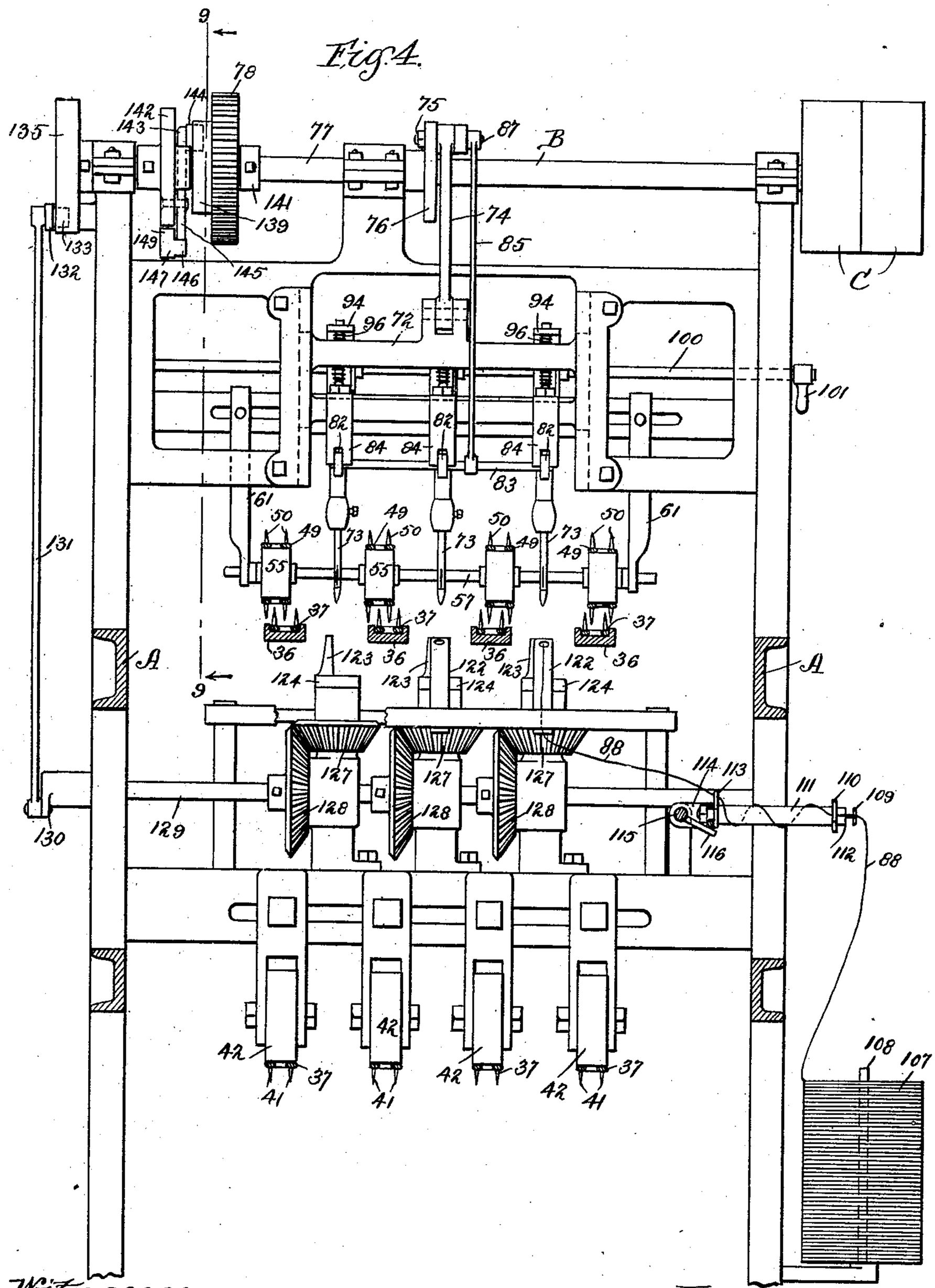
(No Model.) 8 Sheets—Sheet 4.

Fig. 4.



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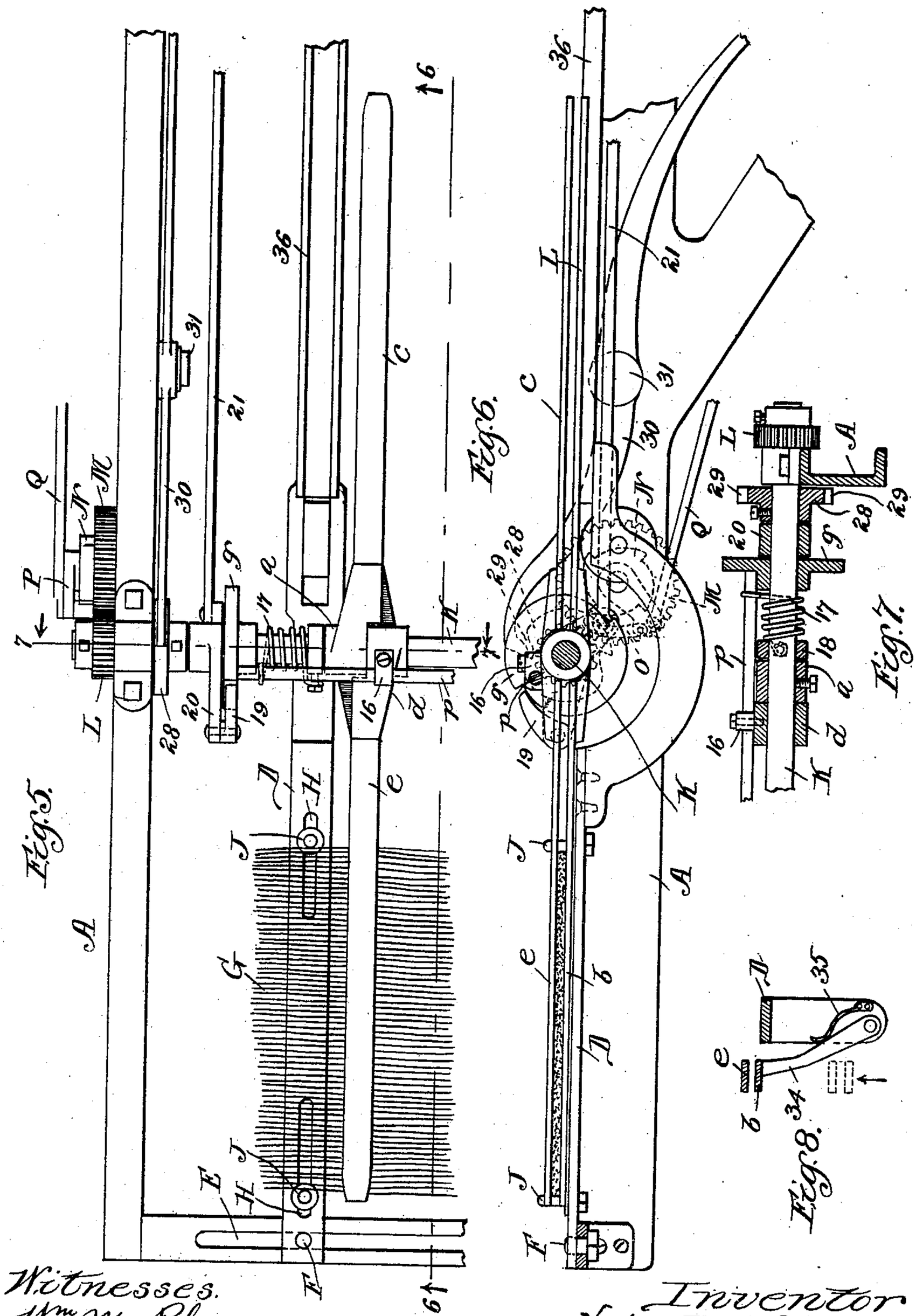
(No Model.) 8 Sheets—Sheet 5.



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(No Model.) 8 Sheets—Sheet 6.

Fig. 9.

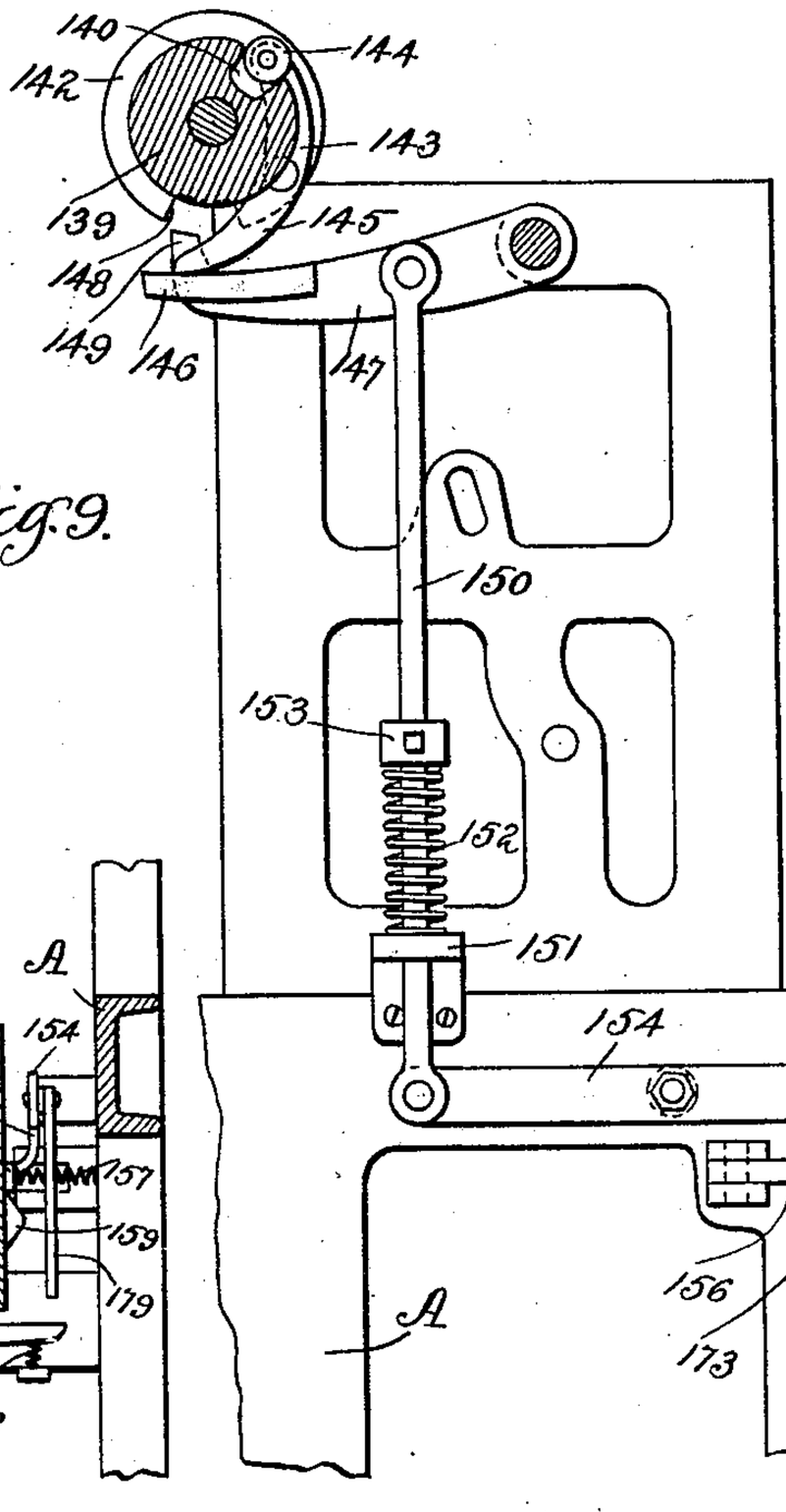


Fig. 9a

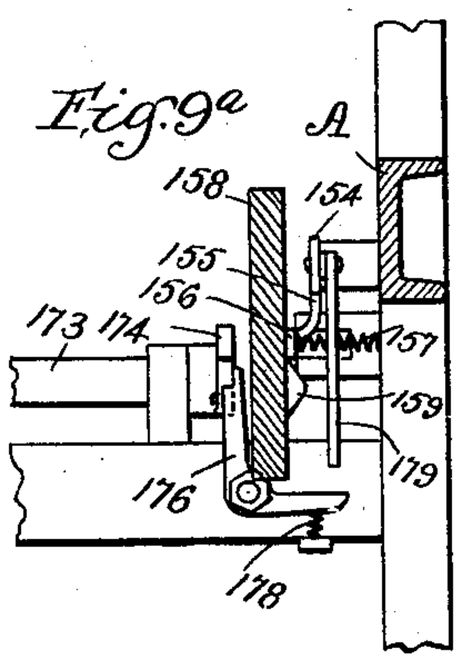
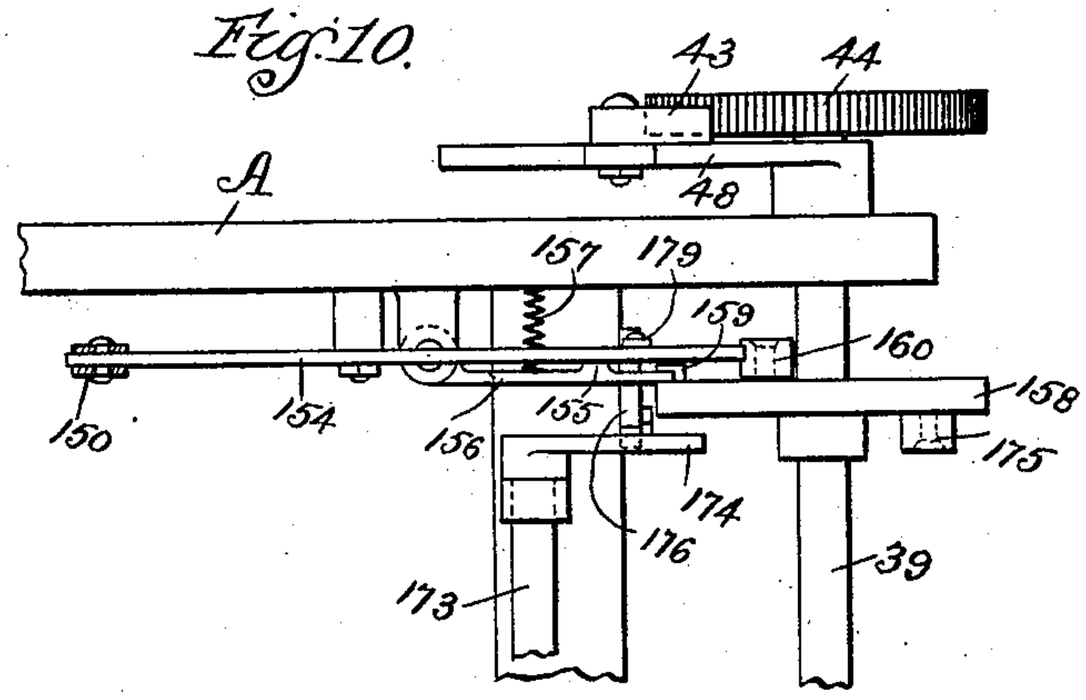


Fig. 10.



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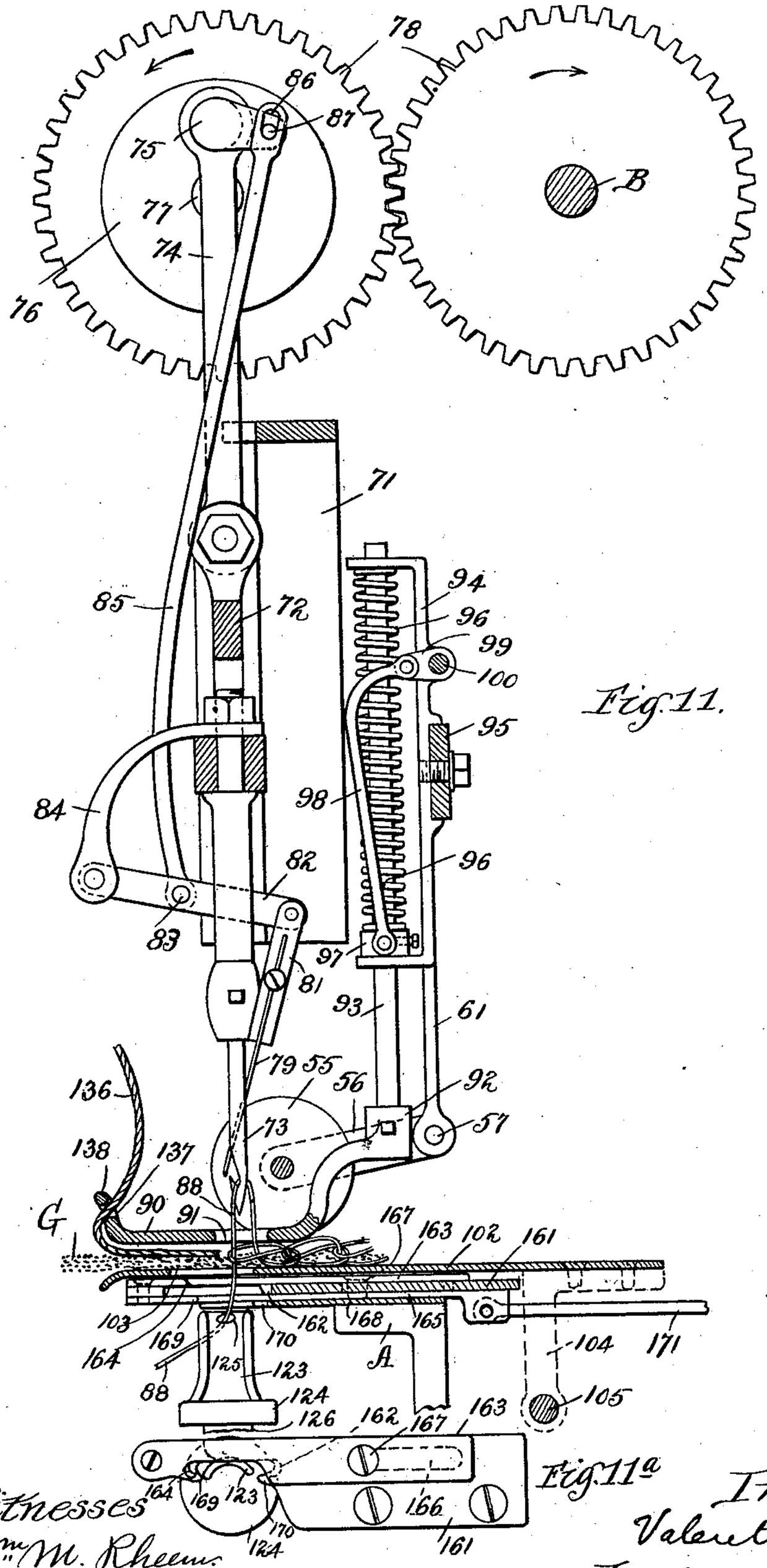

Fig. 11.

Fig. 11a.

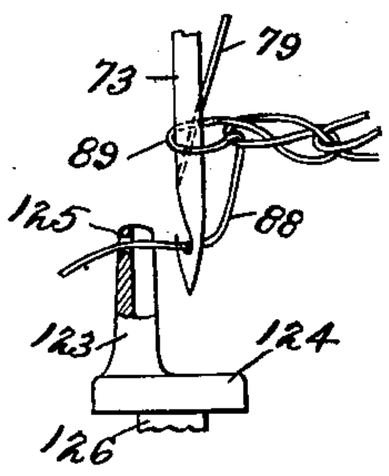

Fig. 12.

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(No Model.) 8 Sheets—Sheet 8.

Fig. 13.

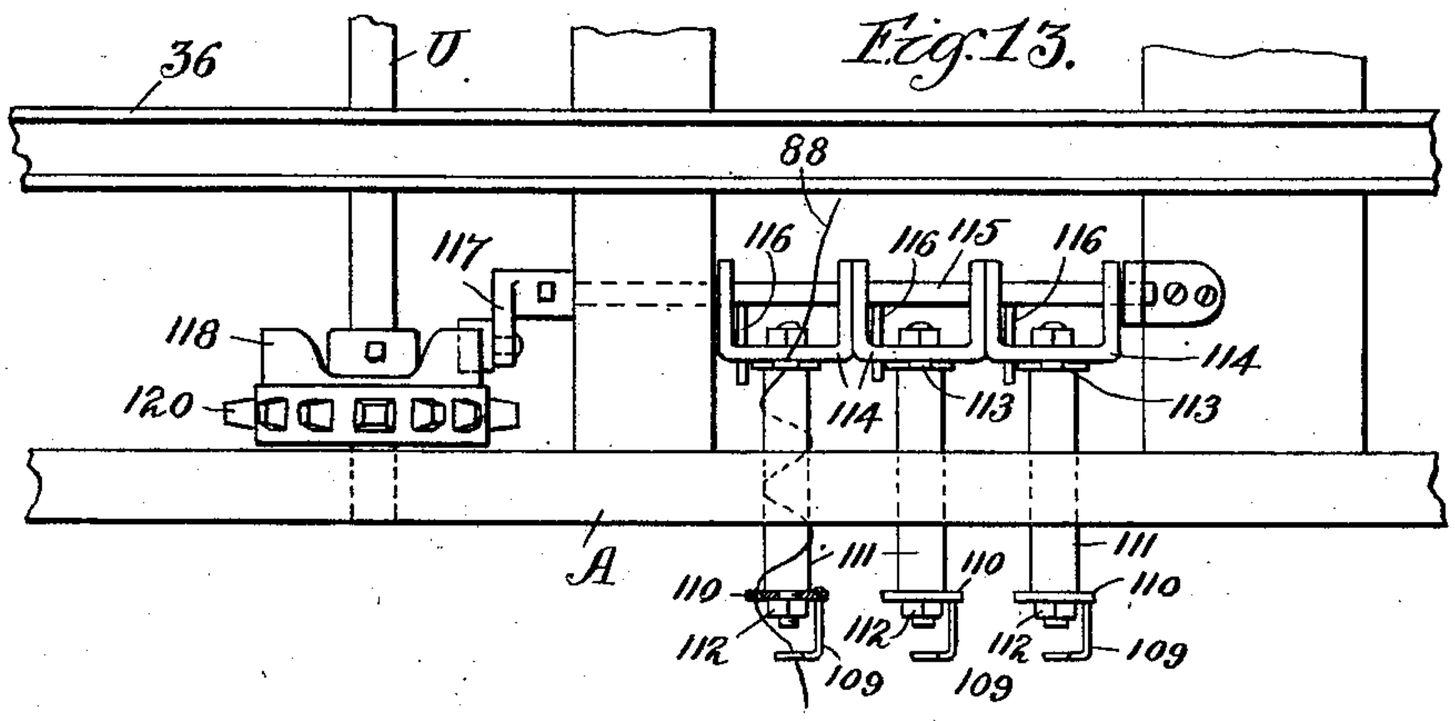


Fig. 14.

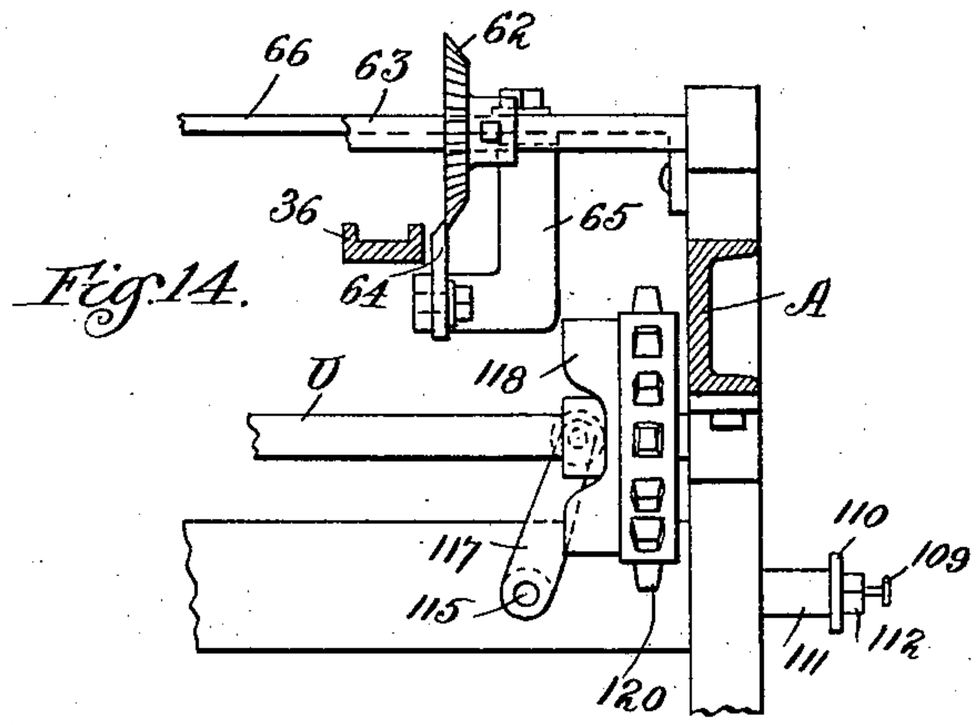
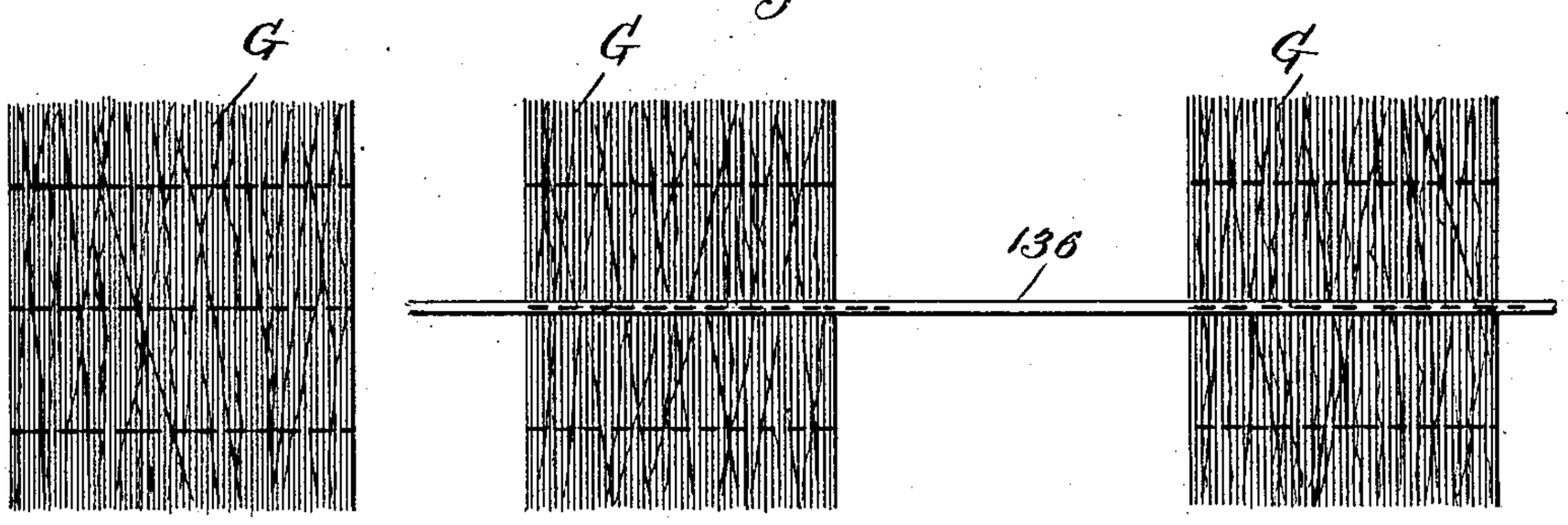


Fig. 15.



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UNITED STATES PATENT OFFICE.

VALENTINE FLECKENSTEIN, OF ST. PAUL, MINNESOTA, ASSIGNOR TO THE NORTHWESTERN GRASS TWINE COMPANY, OF ST. PAUL, MINNESOTA, A CORPORATION OF IOWA.

MACHINE FOR MAKING MATS FOR BOTTLE-COVERS, &c.

SPECIFICATION forming part of Letters Patent No. 705,333, dated July 22, 1902.

Application filed April 5, 1899. Serial No. 711,829. (No model.)

To all whom it may concern:

Be it known that I, VALENTINE FLECKENSTEIN, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Machine for Making Mats for Bottle-Covers and other Purposes, of which the following is a specification.

This invention relates to machines for making mats for bottle-covers and other purposes.

The object of the invention is to provide a machine which is simple in construction and efficient in operation.

The invention consists substantially in the construction, combination, location, and arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally specifically pointed out in the appended claims.

Referring to the accompanying drawings, and to the various views and reference-signs appearing thereon, Figure 1 is a view in side elevation of a machine constructed in accordance with my invention. Fig. 2 is a plan view of the same, parts in horizontal section and parts omitted. Fig. 3 is a view in vertical central longitudinal section. Fig. 4 is a view in vertical transverse section on the line 4 4, Fig. 3, looking in the direction of the arrows. Fig. 5 is a broken detail view, in plan and on an enlarged scale, showing the clamping-arms for clamping and transferring the mat to the feeding devices and means for operating the same. Fig. 6 is a sectional view of the same on the line 6 6, Fig. 5, looking in the direction of the arrows. Fig. 7 is a detail sectional view on the line 7 7, Fig. 5, looking in the direction of the arrows. Fig. 8 is a sectional detail view on the line 8 8, Fig. 2, looking in the direction of the arrows. Fig. 9 is a broken detail sectional view on the line 9 9, Fig. 4, looking in the direction of the arrows. Fig. 9^a is a broken detail sectional view on the line 9^a 9^a, Fig. 9, looking in the direction of the arrows. Fig. 10 is a broken detail view in plan of the clutch-operating mechanism shown in Fig. 9. Fig. 11 is a broken detail view, in vertical section, on an enlarged scale, showing the construction of the stitching mechanism. Fig. 11^a is a detail plan of the thread-severing mechanism. Fig. 12 is a broken detail view illustrating the action of the needle. Fig. 13 is a broken detail view in plan, showing the tension device. Fig. 14 is a broken detail view showing the trimming-cutters. Fig. 15 is a detail view showing the product of the machine as it is delivered.

The same part is designated by the same reference-sign wherever it occurs.

In the drawings, reference-sign A designates the framework of the machine and which is constructed and arranged to support the various working parts hereinafter to be referred to. Journaled in bearings in the frame of the machine is the main drive-shaft B, adapted to receive rotation from any suitable or convenient source and from which the various working parts are operated, the fast and loose pulleys on said main shaft being designated by reference-sign C.

I find it convenient to describe the construction of the machine in the order in which it operates upon the material to produce the finished packing-mats for bottle-covers and other purposes, and therefore I will first describe the construction and arrangement for presenting the material to the machine, referring particularly to Figs. 1, 2, 3, 5, 6, 7, and 8.

Suitably supported upon the machine-frame, at the feed-in end thereof, for lateral adjustment thereon are a series of slats or bars D, arranged to extend longitudinally of the machine, the slot E, in which the securing-bolts F operate, serving to secure the desired adjustment of the slats or bars D transversely of the machine. These slats or bars constitute the table or support to receive the material G—such, for instance, as straw, marsh-grass, or other suitable material from which the packing-mats are made. In the form shown marsh-grass is employed, the stems or strands thereof being arranged in parallel relation and extending transversely across the machine, resting upon the slats or bars D. One or more of the bars or slats D are longitudinally slotted, as shown at H, to adjustably receive the side stops J, by which the width of the mats to be produced is regulated

and adjusted to suit the exigencies of manufacture. In operation the required amount of straw, grass, or other material to form a mat is placed in position upon the slats or bars D and between the side stops J and is evenly distributed to form a mat of the desired and substantially uniform thickness. The material so placed and arranged is now ready to be transferred to the feeding devices. I will therefore now describe the construction, function, and mode of operation of the transferring mechanism.

Adjacent to the feed-in end of the machine and arranged to extend transversely across the machine-frame is suitably journaled a shaft K, carrying a gear-wheel L, arranged to intermesh with a similar gear M, through which rotation is imparted to said shaft. The gear M is suitably journaled upon a stud mounted in the frame of the machine and is provided with a ratchet N, the teeth of which are arranged to be engaged by a pawl O, pivoted to an arm P, journaled on the stud-support of gear M and periodically rocked or oscillated by means of a connecting-rod Q, which is attached at one end to said arm P and at the other end is attached to a lever R, having a slot S therein, in which works a stud T, carried on the face of a wheel W, mounted on a shaft U. In the particular form shown, to which, however, the invention is not limited, the ratchet N is provided with four teeth spaced equal distances apart around the periphery thereof, and therefore upon each excursion of arm P the gear M is rotated one-quarter of a revolution. The intermeshing gears L M are so relatively proportioned that the former is moved one-half a revolution upon each quarter-revolution of the latter.

While I have described the specific construction shown for accomplishing the rotation of shaft K, I desire it to be understood that my invention is not limited or restricted to this specific construction, as many different specific constructions may answer the desired purpose equally as well.

Mounted upon to rock or rotate with shaft K are a series of hubs *a*, each having oppositely-projecting arms *b c*. Coöperating with each hub *a* is a similar hub *d*, loosely sleeved upon shaft K, each hub *d* being provided with oppositely-projecting arms *e f*, the pairs of arms *b e* and *c f* coöperating together to form clamps adapted to grasp the mat G and transfer the same to the feeding devices when shaft K is rocked, as will presently be more fully explained.

Upon shaft K, adjacent to each end thereof, are mounted the disks *g h*, and a rod *p* is carried thereby. This rod extends transversely of the machine and is arranged to engage lugs 16 on the loosely-sleeved clamp-arm hubs *d*. Springs 17 are arranged to exert a tension on rod *p* in a direction tending to rock said loosely-sleeved hubs, so as to close the clamp-arms *e f* thereof upon the clamp-arms *b c*, respectively. A convenient arrangement of the springs 17 is shown, wherein coil-springs are employed, one end thereof being attached to sleeves or washers 18, fixed on shaft K, and the other ends thereof arranged to engage the rod *p*. The normal action of springs 17 is opposed by pawls 19, arranged to engage shoulders formed on the peripheries of the disks *g h*. The pawls 19 are carried in the ends of bell-crank levers 20, loosely sleeved upon shaft K and actuated by rods 21, said rods being connected at one end to arms of said levers 20 and at the other end to arms 22, carried by a rock-shaft 23. An arm 24, mounted on said shaft, is arranged to be engaged by a cam 25, mounted on shaft U. A spring 26 operates to press said arm 24 constantly into engagement with the cam-surface 25. Springs 27 may be employed to retain the ends of pawls 19 in peripheral contact with disks *g h*. (See Fig. 1.) The coöperating pairs of clamp-arms *b e* and *c f* are so disposed and relatively arranged as to operate in the space between adjacent slats D, constituting the table of the machine, and their operation is as follows, assuming the parts to occupy an initial position, as shown in Figs. 1, 2, and 3, wherein the clamp-arm hubs *d* are rotatively displaced upon shaft K relatively to the hubs *a*, being held in displaced position and against the action of springs 17 by the engagement of pawls 19 with the shoulders on disks *g h*, said pawls being retained in this position by the proper surface of cam 25 engaging arm 24 and maintaining shaft 23 and arm 22 in rocked position against the action of spring 26, the rods 21 being thus held in position to maintain the pawls 19 in the positions indicated. These relative positions of the parts will cause the clamp-arms *e* and *f* to be held in open position, as shown, with respect to their coöperating clamp-arms *b c*. The material to form the mat G is then placed in proper position upon the slats D, as above described, and evenly distributed thereon to form a mat of the desired dimensions and thickness. It will of course be understood that the machine action may be arrested during this part of the operation, or, and preferably, the machine is designed to operate continuously, the parts being so relatively arranged and disposed and timed as to their cooperative action as to permit of ample time to place the material in position, as above explained, while the clamp-arm hubs *d* occupy their displaced positions. When the proper time in the operation arrives, the cam 25 releases the arm 24, thus causing arm 22, under the influence of spring 26, to withdraw rods 21, thereby rocking bell-crank arms 20 and permitting the pawls 19 to be withdrawn from the shoulders of disks *g h*, whereupon the tension of springs 17 will cause said shoulders to follow up the retracting pawls, and hence also cause the disks *g h* to rock, carrying with them the rod *p*, and hence rocking the sleeves or hubs *d* and causing the clamp-arms *e* and *f* to be respectively closed upon

arms *b c*. The closing of the arms *e* upon arms *b* effects a clamping therebetween of the material G, which has been placed upon the slats D. At this point in the operation, with the mat G clamped between arms *e* and *b*, the shaft K is given a half-rotation through gears L M and the pawl and ratchet N O P. This half-rotation of said shaft causes the arms *e b*, with the mat G clamped therebetween, to be revolved over into the position occupied by arms *c f*, (see Fig. 6,) thus depositing the mat or material to form a packing-cover in position to be engaged by the feeding devices presently to be described. The arms *c f* by the same movement are rotated into the position thus vacated by arms *b e*. By this time the proper surface of cam 25 has engaged the end of arm 24 to effect the rocking of shaft 23 and arm 22 against the action of spring 26, thus operating rods 21 and rocking arms 20, thereby causing pawls 19 to engage the shoulders on disks *g h* and rock said disks, and hence moving rod *p* against the action of springs 17 and causing hubs *d* to be rotated upon shaft K, thereby causing arms *f* and *e* to separate or rock away from their respective coöperating clamp-arms *c b*, thus releasing the mat G, which has just been transferred between arms *b e*, and also opening arms *f c* to receive the material for the next mat. The operation of the transferring mechanism is then continued in the manner above explained, a fresh quantity of material being introduced between the arms *f c*, while that which has been transferred between arms *b e* is fed on into and through the machine for the further operations thereon, as will be more fully explained hereinafter.

In order to lock shaft K after its half-rotation, as above described, to secure the parts against movement while the material to form a packing-mat or bottle-cover is being placed upon slats D and between the separated clamping-arms, I secure a disk 28 upon said shaft and provide said disk with a peripheral slot, as indicated in dotted lines at 29, Fig. 6, adapted to receive the end of a lever 30, pivotally mounted, as at 31, upon a convenient part of the framework and having its other end arranged to ride upon the periphery of a disk 32 upon shaft U, said disk having a projecting lug 33, by which at the proper time in the operation of the machine said lever is rocked to disengage the stop end thereof from engagement with the notch 29 of disk 28, thus permitting shaft K to be rotated. As soon as the lug 33 has passed said lever it is free to again engage notch 29 as soon as shaft K has revolved the required distance.

In order that the lower member of the pair of clamp-arms *b e* or *c f* which occupies the position for receiving the mat or material to form a mat or cover may be supported adjacent to the surface of slats D, I provide a lever 34, pivoted to a convenient part of the framework and pressed outwardly by a spring 35 into the path of the arms *b e* or *c f*, as the case may be, when said arms are moved or revolved into receiving position. (See Fig. 8.) The spring 35 permits said lever to recede to permit the clamping-arms to pass by it; but as soon as the arms clear the end of said lever the latter is returned into position to form a rest for the lowermost arm, as clearly shown, thereby sustaining and supporting the same.

In the foregoing I have described two sets of pairs of clamping-arms and a construction wherein the transferring-shaft K periodically revolves only a half-revolution. It is obvious, however, that the principles of my invention are not limited to this specific construction, as said shaft may be provided with only one set of pairs of clamping-arms or any desired number of such sets, and the gearing may be so arranged as to impart to said shaft K any desired periodic rotation and through any desired distance, depending upon the number of sets of clamping-arms employed. Thus stop-disk 28 is provided with notches 29, arranged to lock shaft K at the required points, as many notches being employed as there are stops to be made in each cycle of movement.

I will now describe the feeding devices to which is delivered the material, as above explained.

Arranged to extend longitudinally of the machine is a suitable bed or table in the form of channel-guides 36, which, if desired, may be made adjustable transversely of the machine. In each of these channel-guides is arranged to operate a traveling carrier 37 in the form of an endless belt or band. These carriers are arranged to operate over and to be actuated by sprocket-gears 38, mounted upon a shaft 39 at the rear end of the machine, and an idle guiding-wheel 40 may be arranged at the front end of each of the channel-guides over which said carriers operate. When the clamping-arms are revolved with the material to form a packing mat or cover clamped therebetween, said arms deliver upon the front ends of the carriers, and the actuation of the carriers causes the material to be engaged and fed on into the machine. After the clamp-arms have been separated to release the material the uppermost of said arms in the delivery position remains stationary, only the lowermost arm being rocked. This facilitates the engagement of the carrier with the material and enables the carrier to effect an efficient grasp on the material to feed it along. In order to still further insure an efficient feed, the carriers are provided in the feed-surface thereof with projecting spikes 41, which engage the material. The carriers may be maintained at the proper tautness and may be suitably guided by means of idle tightening-rolls 42, suitably mounted in the machine-frame, as clearly shown in Figs. 3 and 4. Movement may be imparted to shaft 39 from the main operating-shaft B or other

convenient rotating part of the machine in any suitable manner. In the form shown, to which, however, the invention is not limited, shaft 39 is given a step-by-step rotation by means of an arm 48, pivoted concentric with said shaft and carrying a pawl 43, arranged to engage the teeth of a ratchet-wheel 44, carried by said shaft. Arm 48 is rocked by means of a rod 45, connected at one end to the free end of said arm and at the other end connected to a wrist-pin 46, eccentrically mounted upon the face of a disk 47 upon main drive-shaft B. By this construction a rotation of shaft 39 through a definite distance is imparted upon each rotation of the main shaft. The object of the step-by-step feed is to enable the needle mechanism, presently to be described, to perform its work in the desired manner.

So long as the clamp-arm *c* or *b*, as the case may be, remains in the delivering position it coöperates, as above explained, with the feeding-carrier to effect an engagement of the carrier with the material, said arms forming stationary parts along which the carrier moves, the material being located between the two. In order to provide means coöperating in a similar manner with the carrier after the material has been carried beyond the end of the clamp-arms, I arrange an auxiliary endless belt or band 49 to operate above and in proximity to the lower carrier 37, the material being engaged on top by the upper or auxiliary carrier 49 and on the under side by the lower carrier 37. As shown, the auxiliary carrier extends from a point adjacent to the ends of the clamp-arms to the rear of the needle mechanism and is also provided with projecting pins 50, thus insuring a positive and efficient feed of the material through the machine. The auxiliary feed-belts 49 pass over and are driven by sprocket-wheels 51, mounted on a transverse shaft 52, and are held in suitable relation by the idle rolls 53, carried in the ends of swinging arms 54, pivotally supported upon a convenient part of the framework, as shown in Fig. 3.

In order that the feed-carriers may be held steadily to their work at the point where the needle operates, I arrange the presser-rolls 55 to bear upon the operating-bed of the auxiliary feed-carrier to press the same down upon the material and the main carrier. The presser-rolls 55 are carried in the ends of arms 56, hinged upon a rod 57, suitably supported in standards 61 upon the machine-frame for adjustment thereon.

The shaft 52 may be driven in any suitable or convenient manner so as to secure coincidence of travel of the auxiliary carrier with the carrier 37. I have shown a convenient arrangement of gearing for securing this result, wherein a shaft 58 is driven from shaft 39 through suitable gearing 59 and in its turn drives shaft 52 through the gears 60. (See Fig. 1.)

It is important and desirable to reduce the grass stems, strands, or stalks to proper and uniform length. This operation may be performed in any suitable manner and at any desired point in the operation of the machine. In the construction illustrated I have shown the trimming apparatus arranged to perform their function of trimming or cutting the ends of the grass to the required length during the feed of the material from the clamp-arms to the needle mechanism; but it is obvious that this apparatus may be arranged at any other point. In the particular construction shown the trimming apparatus comprises rotary cutters 62, mounted on a shaft 63, journaled transversely of the machine. The cutters 62 are arranged at opposite sides of the machine to revolve in paths a distance apart corresponding to the length to which the straws are to be reduced. The cutters are adjustably sleeved upon shaft 63, whereby the distance between them may be suitably adjusted. Arranged to coöperate with each cutter 62 is a stationary ledger-blade 64, (see Fig. 14,) carried in an arm 65, which is supported in a bar 66, extending transversely of the machine, said bar being slotted to permit of the adjustment of the arms 65 transversely of the machine to correspond to the transverse adjustment of the cutters 62, as required for any desired length of packing mat or cover. The shaft 63 may be driven in any suitable manner. I have shown a convenient arrangement wherein said shaft is driven, by means of a belt 67, from main drive-shaft B, said belt passing around suitable guide-rollers 68 and over a drive-pulley 69 on shaft 63. After the material has been reduced to the proper length it is next presented to the action of the needle mechanism, where the packing mat or cover is stitched transversely across. Any desired number of rows of stitches may be made. In the construction shown I have made provision for three rows, and I will now describe the construction, function, and mode of operation of the stitching mechanism.

In suitable guides 70, formed vertically in a transverse supporting part 71 of the main frame, is mounted to reciprocate the needle-frame 72, in which the needles 73 are suitably supported. The needle-frame 72 is vertically reciprocated in its guides by means of a pitman 74, connected at one end to said frame and at the other end to a wrist-pin 75, eccentrically mounted in a disk 76, carried by a shaft 77, suitably mounted in the framework and driven through gears 78 from main shaft B. In order that the thread employed to form the stitches may be retained over the hook of the needle and released therefrom at the desired points in the operation of the machine, I provide a special construction and arrangement wherein is employed a pin or rod 79, arranged to coöperate with the needle. In order that this pin or bar may perform its desired function in an efficient manner, I provide an inclined slot or passage 80 through

the needle and arrange the pin or rod 79 to pass through such slot or passage, so that the end thereof will be brought into proper juxtaposition with respect to the hook of the needle. In order that the pin or rod 79 may be given the required movement relative to the needle to uncover the hook thereof at the desired time, I mount said pin or rod upon a bar 81, which is pivotally connected to the free end of a lever 82, the latter being hinged at its opposite end upon an arm 84, carried by the needle-frame 72. Of course it will be understood that each needle may be provided with a coöperating pin or rod 79. The levers 82 are connected to a rod 83, to which a movement independent of the reciprocations of the needle-frame is imparted in any suitable manner—as, for instance, through a connecting-rod 85, having an elongated slot 86 in the end thereof, in which slot operates a pin 87 on the end of a crank-arm formed with or connected to the wrist-pin 75. By this construction it will be seen that the needle and its coöperating pin move together or in unison when the needle-frame is actuated; but by the special construction above described these parts are permitted a relative movement—that is, when the needles have been projected to their lowermost positions to engage the stitching-thread, as shown in Fig. 12, the pins or rods 79 are held slightly elevated or retracted into the passages or slots 80, thus enabling the hooks of the needles to engage the thread 88. Now when the needle-frame begins its upward movement the elongated slot 86 permits the pin 87 to move therein to the limit thereof before the pin or rod 79 takes up a coincident movement with the needle and its frame. The result of this play due to slot 86 is to cause the pin or rod to be again projected over the hook of the needle, as shown in Fig. 11, thus retaining the thread 88 in engagement with the hook and also permitting the loop 89, previously formed in the thread, to be pulled or to easily slip off the needle without catching on the hook.

In order that the material may be held in proper position during the operation of the needles, I provide a presser-foot 90, having an opening 91 therein, through which the needle operates. The presser-feet are carried by a bar 92, supported upon a rod 93, mounted to freely slide in bearings in a frame 94, suitably supported for adjustment upon a transverse bar 95. A spring 96 is arranged to bear at one end upon a flange of said frame 94 and at the other upon a collar 97, adjustably secured upon rod 93. The tension of this spring normally acts to press the frame 92 downwardly, and hence holding the presser-feet down upon the material. Suitable means may be provided for raising or lowering the presser-feet. I have shown simple and efficient means for this purpose, wherein an arm 98 is connected at one end to collar 97 and at the other end is pivoted to a crank-arm 99, secured to a shaft 100, suitably journaled. This shaft is provided at the side of the machine with a handle 101, (see Fig. 4,) by which it may be rocked in its bearings. By this construction it will be seen that when it is desired to raise the presser-feet the shaft 100 is rocked, thus swinging crank-arms 99, and hence causing the collars 97, and with them the rods 93, to be swung upwardly, thus elevating or raising the presser-feet. By rocking the shaft 100 far enough for the crank-arms 99 to pass their dead-centers the presser-feet will be retained in elevated position. In practice I arrange a presser-foot in connection with each needle.

Associated with each needle is a bed-plate 102, having a slot or opening 163 therein, through which the needle operates. This bed-plate is arranged beneath the needle, and the material while being stitched is pressed down upon this bed-plate by the presser-foot 90, whereby it is efficiently held during the stitching operation. In order that inspection of the parts may be facilitated and to render adjustment, replacement, or repair of the parts easy, it is desirable to provide means whereby the bed-plates 102 may be raised. To accomplish this result, each bed-plate is supported upon an arm 104, carried on a shaft 105, arranged to extend transversely of the machine, and provided at one side of the machine in position to be readily accessible with an operating-handle 106. (See Fig. 2.) By rocking this shaft the bed-plates 102 may be tilted or raised, thus permitting and facilitating access to the parts adjacent thereto for inspection, replacement, repair, or other purpose.

I will now describe the construction and arrangement whereby the thread is delivered to the needle in proper manner to form the stitches and under the desired tension. The thread, in the form of a spool 107 or in any other suitable or convenient form, is suitably supported at a convenient point on or adjacent to the machine—as, for instance, upon a rod 108—whereby it may be reeled off as required for use by the needle, it being understood that as many of such spools are employed as there are needles to be supplied. From the reel or spool the thread is led through a tension device, whereby a desirable tension is imposed thereon to resist the drawing action of the needle. In arranging this tension device it is desirable to provide against breakage of the thread through any unusual jerk or pull that may be exerted thereon. It is also desirable to make provision whereby the thread may be reeled from the spool without interfering with or changing the tension under which it is supplied to the needle. Many specifically-different arrangements for accomplishing these objects may be employed. As illustrative of a simple and efficient construction for the purpose I have shown an arrangement wherein the thread from each spool is led through an opening in a flange 109, formed with or connected to a disk 110, the latter being loosely mounted

upon the end of a rod or arm 111. A set-screw 112 serves to regulate the friction by which said disk is clamped against a shoulder formed on the end of said rod or arm. After passing through the eye or opening in the guide-flange 109 the thread is led through a notch or opening in the disk 110 and is then given one or more turns about the rod or arm 111 and finally passes through a notch or opening formed in a disk 113, supported upon the inner end of the rod or arm. Each of said rods or arms is bolted to or otherwise secured upon a frame 114, the ends of which are loosely sleeved upon a shaft 115, suitably journaled in bearings formed in the framework of the machine. Said shaft 115 is provided with crank arms or fingers 116, arranged to engage the frames 114 on the under side thereof—that is, the frames 114 rest upon and are supported by the crank-arms 116, but are free to move independently thereof. In order to unreel the thread from the spools 107, the shaft 115 is given a periodic rocking movement, whereby the rods or arms 111 are raised and lowered, thus drawing the thread from the spools. The rocking movement of said shaft may be imparted in any suitable manner. In the construction shown I provide said shaft with a crank-arm 117, arranged to bear against the surface of a cam 118, mounted upon shaft U and suitably shaped to impart the desired periodic rocking movement to said shaft 115, the weight of the frames 114 and the rods or arms 111, carried thereby, resting upon the fingers or projections 116, serving to hold the crank-arm 117 in contact with the cam 118. Rotation is imparted to shaft U through a sprocket-chain 119, engaging over sprocket-gears 120 121, respectively mounted on shafts U and 39. (See Fig. 2.) By the construction above described it will be seen that the arms or rods 111 are periodically rocked or swung around shaft 115, thus drawing the thread from the spool 107. It will also be seen that this movement of the arms or rods does not interfere with or affect the tension under which the thread is supplied to the needle. It will also be seen that the rods or arms 111 are free to be raised independently of the shaft 115 whenever an undue pull is exerted by the needle, thus relieving any sudden or extraordinary tension which may occur without danger of breaking the thread, and by simply turning up on the set-screws 112 any desired tension may be imposed upon the feed of the thread to the needles.

From the tension device above described the thread 88 for each needle is led through a suitable guide 122, mounted upon the frame of the machine, and thence is led through an opening 125 in a stud or finger 123, eccentrically mounted on a disk 124. The disks 124 are carried by short shafts 126. These shafts are periodically rocked in order that the thread may be presented in proper position to be engaged by the needle. This rocking movement may be imparted by any suitably-arranged or convenient gearing. I have shown a simple arrangement for accomplishing the purpose, wherein bevel-gears 127 are mounted on the shafts 126, which gears are engaged and operated by gears 128, mounted upon a shaft 129, transversely journaled in the framework. This shaft is provided with a crank-arm 130, to which is connected one end of a rod or pitman 131, the other end of said pitman being connected to the free end of a lever 132, pivoted upon the framework of the machine and carrying a roller 133, arranged to operate in a cam-groove 134, formed in a disk 135, mounted on shaft 77. The operation of this part of the apparatus is as follows: The needle descends through the slot 91 in the presser-foot, through the body of the material G, and through the slot 103 in the bed-plate 102 and engages the hook thereof over the thread 88, as shown in Fig. 12. Upon ascending the needle pulls the thread through the loop 89, previously formed, said previous loop slipping off of the needle, as shown in Fig. 11. In the meantime the plate or finger 123 has begun to rotate and the material has been advanced another step. The rotation of plate or finger 123 causes a sufficient length of the thread to be drawn in to form a desirable slack therein when said finger is rocked back and to enable the needle to properly engage its hook thereover when said needle is again lowered to the position shown in Fig. 12.

In the operation of a machine embodying my invention and constructed as above described it will be seen that while the machine operates continuously the material is not fed through in the form of a continuous mat, but the mats or covers are fed through the machine a short distance apart, as indicated in Fig. 15. The advantage of this arrangement is that I am enabled, if desired, to stitch or secure a wrapping-cord (indicated at 136) to the covers or mats at the same time the said mats or covers are stitched. This wrapping-cord may be placed in position to be stitched by one of the needles, as indicated in Fig. 11, a convenient arrangement being to lead the wrapping-cord through a suitable guide-opening 137 in the upturned end 138 of the presser-foot 90, and thence underneath said presser-foot and over the material G in the line of one of the rows of stitches to be formed in the material. Therefore the needle will stitch the wrapping-cord at the same time it stitches the mat or cover. Of course it is obvious that the wrapping-cord may be applied in any other suitable manner to the mat or cover, either before or after it is stitched and at any one of the rows of stitches, as may be desired.

In the particular construction shown, and as indicated in Fig. 15, the completed mats or covers are delivered from the machine in a connected series, the wrapping-cord forming the connection between adjacent mats or covers, and they may be separated from each

other by severing the wrapping-cord adjacent to the edge of one of the adjacent mats or covers, thus producing the completed article with a short section of wrapping-cord attached thereto and projecting therefrom. It will be seen that the packing mats or covers are thus produced in flat condition and in this form are ready for use for packing purposes. In case the mats are required for use as bottle-covers they are applied to the bottles by merely wrapping the same around the bottles, the wrapping-cord being wrapped around the cover and bottle to retain the former in wrapped condition. Of course it is obvious that the wrapping-cord may be omitted entirely, if desired, as indicated at the left of Fig. 15.

During that period in the operation of the machine when a mat or cover has been stitched and before the next batch of material is presented to the operation of the stitching mechanism it is desirable to arrest the operation of the stitching mechanism. This result I secure through the action of an automatic clutch, through which the shaft 77, which operates the stitching mechanism, is coupled or uncoupled from main drive-shaft B. I will now describe the construction, arrangement, and operation of this clutch. The gear 78, through which shaft 77 receives rotation from shaft B, is loosely mounted upon shaft 77 and is provided on the face thereof with a hub 139, having a pocket or seat 140 formed in the periphery thereof. The gear 78 is maintained and held in place on shaft 77 by means of a collar 141, secured to said shaft. Adjacent to the hub 139 and fixed upon to rotate with shaft 77 is a disk 142. Upon the proximate face of this disk is pivotally mounted a clutch-lever 143, carrying at one end thereof a projecting pin or roller 144, adapted at the proper point in the operation to enter the pocket or seat 140 to lock said disk and hub together for coincident rotation, thus rotating shaft 77. The lever 143 is provided with a projecting tailpiece 145, arranged to be engaged at the proper time by a flange or projection 146 upon a lever 147, pivotally mounted on the frame of the machine and actuated in a manner presently to be more fully explained. The operation of this part of the apparatus is as follows: When the lever 147 is rocked to move the flange or projection 146 into the path of tailpiece 145 of the clutch-lever 143, said clutch-lever is rocked, thereby raising the pin or roller 144 out of the pocket 140 in hub 139, and hence thereby unclutching the shaft 77 from its driving-gear. In order that the rotations of said shaft may be arrested instantly as soon as the disengagement of the roller 144 from pocket 140 is effected and without being carried further through momentum, I form in the periphery of disk 142 a notch or shoulder 148, and I provide an upturned finger 149 on the end of lever 147, adapted to engage said notch or shoulder whenever said lever is rocked into position to cause the shaft 77 to be uncoupled from its driving mechanism. When lever 147 is rocked out of the path of the tailpiece 145 and so as to carry the finger 149 out of engagement with shoulder 148, the pin or roller 144 again drops into the seat or pocket 140, when it is brought into register with said roller, thus again coupling the shaft 77 to its driving mechanism, thereby resuming the operation of the apparatus actuated by said shaft. The machine is so timed in its operation that this resumption takes place as soon as another mass or batch of the material to be stitched arrives in position for the stitching mechanism to operate thereon. The lever 147 is operated by means of a rod or pitman 150, mounted to slide in a suitable guide 151. A spring 152 is interposed between said guide and a collar 153 on said rod or pitman. The normal action of said spring is to project said rod in a direction to cause lever 147 to effect an uncoupling of the clutch. The rod or pitman 150 is held retracted against the action of said spring and is released only at the desired point in the operation of the machine to effect an uncoupling of the clutch by a suitable construction and arrangement of parts which I will now describe, the construction and arrangement shown for accomplishing the desired result being merely illustrative of an operative embodiment of means and to which the invention is not to be limited.

In the form shown the end of rod or pitman 150 is connected to one end of a lever 154, pivotally mounted on the framework of the machine. The rod or pitman 150 is held retracted against the action of spring 152 by means of a lug or catch 155 engaging under and supporting the free end of lever 154. This lug or catch is carried by a lever 156, pivotally mounted on the frame, and normally held by means of a spring 157 in position for the lug or catch 155 to form a support for lever 154. Upon a disk 158, mounted upon shaft 39, is formed a cam projection 159, arranged to engage the free end of lever 156 at the proper point in the operation of the machine and rock the same against the action of spring 157 and in a direction for the supporting lug or catch 155 to be carried clear of the lever 154. As soon as this lug clears said lever the latter is free to be rocked, thus permitting the tension of spring 152 to be exerted upon rod or pitman 150 in a direction to throw lever 147 into position to unclutch shaft 77. In Figs. 9 and 9ª the parts are shown in their relative positions on the eve of the disengagement of lug or catch 155 as a support for the lever 154. This point in the operation of the machine is reached, as above explained, when the stitching mechanism has completed its work upon a mat or cover, so that the stitching mechanism will be arrested until the feed devices present the next batch of material thereto.

The clutching of shaft 77 to its drive-gear 78 is effected by means of a pin or roller 160, carried by disk 158 and arranged to engage

the end of lever 154, thereby rocking the same, so as to permit the lug or catch 155 to again engage underneath and support the same, the movement of said lever also serving to withdraw rod or pitman 150 against the action of spring 152, and hence moving the end of lever 147 out of the path of tailpiece 145 of clutch-lever 143.

It is desirable to provide means for cutting or severing the stitching-thread as soon as the action of the needles is arrested in order to avoid waste. Many specifically different constructions and arrangements for accomplishing this purpose may be adopted. As an illustrative embodiment of an operative construction for the purpose I have shown an efficient arrangement wherein associated with each needle is a thread-severing mechanism and which I will now describe, particular reference being had to Figs. 11 and 11ª, wherein 161 designates a plate stationarily mounted upon the framework and provided with a cutting edge 162, operating as a stationary ledger-blade. Plate 161 serves to form a guide upon which the cutter-plate 163 is supported and slides. The cutter-plate is provided with a cutting edge 164, adapted to coöperate with the cutting edge 162 of the ledger-blade to sever the thread. Arranged on the under side of plate 161 and connected to the cutter-plate 163 is a holder-plate 165. The ledger-plate 161 is longitudinally slotted, as at 166, and a bolt 167 for securing plates 163 and 165 together passes through said slot, thus forming means for guiding said plates when operated. Arranged to coöperate with the holder-plate 165 is a stationary spring-plate 168. The parts above described are so arranged as to intersect the line of feed of the thread from the stud or finger 123 to the needle, the thread passing between the cutting edges 162 and 164 and also between the edge 169 of the holder-plate and the coöperating edge 170 of the spring-plate 168.

The operation of the parts just described is as follows: When the proper time in the operation of the machine arrives for the thread to be severed, the cutter-plate 163 and attached holder-plate are moved across the line of feed of the thread and toward their respective coöperating stationary plates 161 and 168. In practice the edge 169 of the holder-plate is arranged to project slightly in advance of the cutting edge 164 of the cutter-plate. Similarly the coöperating edge 170 of spring-plate 168 projects slightly beyond the cutting edge 162 of the stationary edge plate 161. Therefore the thread will first be grasped or pinched between the coöperating edges 169 and 170 before the knife-edges begin to perform their work. Thus the thread is firmly gripped and held, while the further movement of cutter-plate 163 and holder-plate 165 causes the cutting edges to coöperate in severing the thread. The movement of plates 163 and 165 to clamp and sever the thread is effected through a rod 171, connected to a crank-arm 172, mounted on a rock-shaft 173, journaled in the framework of the machine. Upon shaft 173 is mounted a crank-arm 174, arranged to project into the path of a pin or projection 175, carried by disk 158, and is normally supported by a trip-latch 176 against the action of a spring 177. The tension of said spring is constantly exerted in a direction to rock shaft 173, so as to cause the cutter-plate 163 to effect a severing of the cord, and the trip-latch 176 supports said crank-arm against the action of said spring. A spring 178 is arranged to normally hold the trip-latch in position to engage and support the crank-arm 174. From this description it will be seen that when the latch 176 is released from crank-arm 174 said crank-arm under the influence of spring 177 is rocked, thereby rocking shaft 173 and through crank-arms 172 and rods 171 causing the cutters to operate to sever the threads, this movement of the cutters being a quick action.

Inasmuch as the severing of the threads should have a definite relation to the arrest of the action of the needles with reference to the times when these operations take place, it is desirable to provide means whereby the operation of arresting the needles will also set in motion the means for severing the threads. Many ways may be devised for accomplishing this result. In the form shown, which is intended merely as an illustrative example of operative means for accomplishing the desired coöperative operation, the lever 154, through which the needle-operating shaft 77 is unclutched from its driving-gear, is provided with an arm 179, arranged when said lever is released from its sustaining-catch 155 to engage the tail of trip-latch 176, as clearly shown in Fig. 9ª, thus also causing said trip-latch to be disengaged from crank-arm 174. Thus as soon as the needle-operating mechanism is arrested the thread-cutters are actuated. The parts are restored to their normal or initial positions ready for the next operation by the raising of lever 154 through the engagement therewith of pin or roller 160, as above explained, until the shoulder 155 again engages thereunder and by the raising of arm 174 through the engagement therewith of pin or roller 175 until the trip-latch 176 again engages thereunder.

It will be noted that the pin or roller 175 engages and lifts arm 174 somewhat later in the rotation of disk 158 than the lifting of lever 154 by pin or roller 160. The object of this is to permit the needles to resume their operation before the ends of the severed threads are released from the thread-holder edges 169 170, and hence avoiding trouble or inconvenience in properly starting the stitches in the next mat or cover.

From the foregoing description it will be seen that I provide an efficient machine wherein the material to form packing mats or covers is arranged, clamped, and transferred to the feeding devices, by which it is posi-

tively fed to the stitching mechanism, by which it is transversely stitched, and the completed article is finally delivered from the machine.

The apparatus shown, while the best form in which I at present contemplate embodying the principles of my invention, is intended as illustrative of an operative embodiment of means for accomplishing the various operations and functions hereinabove explained; but I do not desire to be limited or restricted to the exact details of construction or arrangement shown and described, as many changes therein and variations therefrom would readily suggest themselves to skilled artisans and still fall within the spirit and scope of my invention.

While in the foregoing description I have mentioned grass as the material operated on, it is apparent that other material—such as hay, straw, excelsior, or the like—may also be manufactured by the machine into packing mats or covers. In practice, however, the machine is particularly designed for use in operating on marsh-grass, and it is employed in connection with the operation of the grass-twine-making machine invented by George A. Lowry, as disclosed in application for patent, Serial No. 643,768, filed July 7, 1897. The collected marsh-grass is first selected for use in making the twine, only the longer stems, strands, or stalks being employed for such purpose. The shorter stalks or stems, which are undesirable for use in the manufacture of the twine and which have heretofore been thrown away and wasted, are suitable for use in making bottle-covers or packing-mats and are worked up by the machine of the present invention into useful commercial commodities. Thus the utilization of this by-product of the grass-twine manufacture enables all the collected grass to be used without undue or serious waste, and by using what would otherwise be a waste material the packing-mats, bottle-covers, and the like, which are efficient for the purposes required of them, are produced at a minimum expense.

Having now set forth the object and nature of my invention and an apparatus embodying the principles thereof and having described the construction, function, and mode of operation thereof, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent of the United States, is—

1. In a machine for making packing covers, mats and the like, the combination with the stitching mechanism and the feeding devices, of a stationary table adapted to receive the material in sufficient quantity to form a single cover or mat, means for clamping such material, and means for moving said clamp to transfer the clamped material to said feeding devices, and means for releasing said clamp to deposit the material upon the feeding devices, as and for the purpose set forth.

2. In a machine for making packing-covers and the like, the combination with the stitching mechanism and feeding devices, of a table adapted to receive the material in the form of a single mat, pivotally-mounted and relatively movable clamping-arms for grasping such mat, means for moving said arms relatively to each other to clamp such mat, means for swinging said arms about their pivotal support to transfer such mat to the feeding devices, and means for releasing said clamping-arms to deposit the mat upon the feeding devices, as and for the purpose set forth.

3. In a machine for making packing-covers and the like, the combination with the stitching and feeding devices, of a table adapted to receive a sufficient quantity of the material in the form of a mat to form a single cover, adjustable stops for regulating the width of such mat, and means for bodily transferring such mat to and depositing the same upon the feeding devices, as and for the purpose set forth.

4. In a machine for making packing-covers and the like, the combination with the stitching and feeding devices, of a series of slats arranged to form a table for receiving and supporting a sufficient quantity of the material to form a single cover in the form of a mat of uniform thickness and suitable width, clamping-arms arranged to operate between said slats for clamping said mat, and means for rocking said arms, whereby the said mat is transferred to the feeding devices, and means for releasing said clamping-arms to deposit the mat upon said feeding devices, as and for the purpose set forth.

5. In a machine for making packing-covers and the like, the combination with the stitching and feeding devices, of a table adapted to receive the material in sufficient quantity to form a single cover in the form of a mat, a rock-shaft journaled adjacent to said table, clamp-arms arranged in coöperating pairs and mounted thereon and adapted to clamp said mat, and means for rocking said shaft whereby the mat is bodily transferred to said feeding devices, and means for opening and closing said coöperating pairs of clamp-arms to clamp and release the mat, as and for the purpose set forth.

6. In a machine of the class described, a table adapted to receive the material in sufficient quantity to form a single mat, a stitching mechanism and feeding devices, in combination with a transferring device for the material, comprising a rock-shaft, clamping-arms mounted thereon in coöperating pairs, means for relatively moving the members of the pairs of clamping-arms to clamp and release the material, and means for periodically rocking said shaft to effect the transfer and delivery of the material, whereby each mat is separately clamped and transferred from said table to said feeding devices and deposited thereon for presentation to the stitching devices, as and for the purpose set forth.

7. The combination with stitching and feeding devices, and a table adapted to receive the material in sufficient quantity to form a single mat, of a transferring mechanism including a rock-shaft, hubs mounted thereon to rotate therewith, each carrying a clamping-arm, coöperating hubs loosely mounted on said shaft and carrying coöperating clamping-arms, means for rotarily displacing said loosely-mounted hubs to open and close said clamping-arms, and means for rocking said shaft whereby such mat is clamped and transferred from said table to said feeding devices and deposited thereon for presentation to the stitching devices, as and for the purpose set forth.

8. The combination with stitching and feeding devices, and a table adapted to receive the material in sufficient quantity to form a single mat, of a transferring mechanism including a rock-shaft, a series of clamping-arms mounted thereon to rotate therewith, a cooperating series of clamping-arms loosely mounted on said shaft for independent rotative movement thereon relative to said first-mentioned series of arms, means for moving said loosely-mounted arms to close upon and to open with respect to said first-mentioned arms, and means for rocking said shaft whereby such mat is clamped and transferred from said table to said feeding devices and deposited thereon for presentation to the stitching devices, as and for the purpose set forth.

9. The combination with stitching and feeding devices, and a table adapted to receive the material in sufficient quantity to form a single mat, of a transferring mechanism including a rock-shaft, a series of clamping-arms mounted thereon to rotate therewith, a coöperating series of clamp-arms loosely mounted on said shaft, means normally tending to close said loosely-mounted arms upon the first-mentioned arms, a stop-catch for holding said loosely-mounted arms in open position, means for releasing the same, and means for rotating said shaft whereby such mat is clamped and transferred from said table to said feeding devices and deposited thereon for presentation to the stitching devices, as and for the purpose set forth.

10. The combination with stitch-forming mechanism and feeding mechanism of a transferring-shaft, hubs mounted thereon to rotate therewith, and carrying clamp-arms, coöperating hubs loosely mounted upon said shaft and carrying coöperating arms, springs arranged to normally act to close said loosely-mounted arms upon the first-mentioned arms, a stop for maintaining said loosely-mounted arms in open position, means for releasing said stop, and means for rotating said shaft, as and for the purpose set forth.

11. The combination with stitch-forming mechanism and feeding mechanism of a transferring-shaft, clamp-arms carried thereby to rotate therewith, coöperating clamp-arms loosely mounted on said shaft, a rod connected to move with said shaft and arranged to engage said loosely-mounted arms, a spring connected to said rod and normally acting to close said loosely-mounted arms upon the first-mentioned arms, a stop for maintaining said rod in retracted position, means for releasing said stop, and means for rocking said shaft, as and for the purpose set forth.

12. The combination with a table adapted to receive the material in sufficient quantity to form a single mat, a stitching mechanism, feeding devices for presenting the material to said stitching mechanism, and a transferring-shaft, of a series of stationary, and a cooperating series of relatively movable, clamp-arms, carried by said shaft, springs normally acting to close said movable arms upon the relatively stationary arms, a stop for holding said arms in open position, a cam for periodically releasing said stop, and means for rotatively moving said shaft, whereby such mat is clamped and transferred from said shaft to said feeding devices and deposited thereon for presentation to the stitching mechanism, as and for the purpose set forth.

13. The combination with stitch-forming mechanism and feeding mechanism of a transferring-shaft, a series of stationary clamp-arms and a coöperating series of relatively movable clamp-arms carried by said shaft, a rod connected to said movable clamp-arms, a disk mounted on said shaft and connected to said rod, and provided with a shoulder, a spring operating upon said rod to close said movable arms upon said relatively stationary arms, a pawl arranged to engage said shoulder, a lever for operating said pawl, a cam for actuating said lever, and means for rocking said shaft, as and for the purpose set forth.

14. The combination with a table adapted to receive the material in sufficient quantity to form a single mat, a stitching mechanism, feeding devices for presenting the material to said stitching mechanism, and a transferring-shaft, of a series of stationary clamp-arms, and a coöperating series of relatively movable clamp-arms carried by said shaft, means for periodically opening and closing said movable arms relative to said stationary arms, means for locking said shaft against rotation while said clamp-arms are in open position, and means for rotating said shaft when said arms are closed, whereby such mat is clamped and transferred from said table to said feeding devices and deposited thereon for presentation to the stitching mechanism, as and for the purpose set forth.

15. The combination with stitch-forming mechanism and feeding mechanism of a transferring-shaft, a series of stationary hubs and a coöperating series of relatively movable hubs mounted on said shaft, a pair of oppositely-projecting clamp-arms carried by each hub, said hubs being arranged in coöperating pairs, means for holding the hubs of each pair rotatively displaced against a tension,

whereby the clamp-arms of one hub are in open position relative to the arms of the other hub, means for periodically releasing said holding means, and means for rotating said shaft a half-revolution when said holding means are released, as and for the purpose set forth.

16. In a machine of the class described, stitch-forming mechanism and feeding mechanism, in combination with a transferring mechanism including a shaft, clamp-arms carried thereby, means for rotatively moving said shaft, and a support for the arms when in position to receive the material to be clamped, said support being yieldingly mounted to permit the arms to pass by it, as and for the purpose set forth.

17. In a machine of the class described, stitch-forming mechanism and feeding mechanism, in combination with a transferring mechanism including a shaft, clamp-arms carried thereby, means for rotatively moving said shaft, a lever arranged to project into the path of said arms, and a spring for yieldingly holding said lever in position, whereby said arms are permitted to pass by said lever and then to be supported thereby, as and for the purpose set forth.

18. In a machine of the class described, a table adapted to receive the material to be operated on, a pivotally-mounted clamp having clamping-arms arranged to grasp a sufficient amount of the material to form a single mat, an endless feed-carrier, means for moving said clamp-arms into position to transfer the mass of material bodily to, and to deliver the same upon, said carrier, a stitching mechanism, a main drive-shaft, and means actuated from said main drive-shaft for operating these several parts, as and for the purpose set forth.

19. In a machine of the class described, a main drive-shaft, a counter-shaft having sprocket-gears thereon, means for imparting a step-by-step rotation to said counter-shaft from the main drive-shaft, feed-carriers arranged to be engaged and actuated by said sprocket-gears, an auxiliary counter-shaft carrying sprocket-gears, auxiliary feed-carriers actuated thereby and arranged over and coöperating with said first-mentioned carriers to feed the material, and gearing actuated by said first-mentioned counter-shaft for actuating said auxiliary counter-shaft, in combination with clamping-arms arranged to receive the material in sufficient quantity to form a single mat, means for actuating said clamping-arms to transfer such material to and deposit the same upon said carrier, and stitch-forming mechanism past which the carrier operates, as and for the purpose set forth.

20. In a machine of the class described, a stitching mechanism and a clamping and transferring mechanism arranged to successively receive and transfer the material, in sufficient quantities to form single mats or covers, to feed devices for presentation to said stitching mechanism, in combination with feed devices comprising a feed-carrier, a coöperating auxiliary carrier, said carriers adapted to engage and feed the material between them, and a presser-roll arranged to hold said carriers steadily to their work adjacent to the stitching mechanism, and means for actuating said carriers, as and for the purpose set forth.

21. In a machine of the class described, a stitching mechanism comprising a reciprocating frame, a needle carried thereby, in combination with a pin or rod, a support therefor, said support also connected to said frame, a link connected to said support and pin or rod, means for reciprocating said frame, and means connected to said link for relatively reciprocating said pin or rod, as and for the purpose set forth.

22. In a machine of the class described, a stitching mechanism including a reciprocating frame, a needle mounted thereon and having an inclined opening through the shank thereof, a pin or rod arranged to operate through said opening, a pivoted link connected to said pin or rod, said link being pivotally mounted upon said frame, means for reciprocating said frame, and independent means for rocking said link, as and for the purpose set forth.

23. In a machine of the class described, a stitching mechanism including a needle having a hooked end, and an inclined opening through the shank thereof, a pin operating through said opening, a frame carrying said needle and pin, a crank-arm for reciprocating said frame, and a rod having a slot engaging said crank-arm, said rod connected to said pin, whereby relative movement is imparted to said needle and pin, as and for the purpose set forth.

24. In a machine of the class described and in combination with stitch-forming mechanism, a reciprocating frame, a needle carried thereby, an arm supported on said frame, a lever connected to said arm, a pin carried by said lever and arranged to coöperate with the needle, a driving-crank for said frame, and a rod having a slot engaging said crank, said rod connected to said pin-supporting lever, as and for the purpose set forth.

25. In a machine of the class described, a reciprocating frame, a series of needles carried thereby, a series of arms also supported on said frame, a lever connected to each arm, a pin supported by each lever and arranged to coöperate with its corresponding needle, a rod connecting all of said levers, a driving-crank for said frame, and a pitman having slotted connection with said driving-crank and connected to said rod, as and for the purpose set forth.

26. In an apparatus of the class described, a main shaft, a counter-shaft, gearing for actuating the latter from the former, comprising a loose gear mounted on said counter-shaft and provided in the hub thereof with a pocket or recess, a wheel mounted on to ro-

tate with said counter-shaft, and a clutch-lever carried by said wheel, said lever carrying a pin adapted to be received in said pocket, whereby said gearing is clutched to rotate with said counter-shaft, said lever provided with a tailpiece whereby it may be rocked into and out of position for the pin thereon to enter said pocket, a lever for engaging said tailpiece, said lever provided with a stop arranged to engage said wheel, whereby when said lever is actuated said gear is unclutched and said wheel is coincidently arrested, a stitching mechanism actuated from said counter-shaft, and means for actuating said lever, as and for the purpose set forth.

27. In an apparatus of the class described, a stitching mechanism, a shaft for actuating the same, a main drive-shaft for rotating said first-mentioned shaft, including a loosely-mounted gear having a pocket in the hub thereof, a wheel fixed upon said shaft, said wheel provided with a shoulder, a clutch-lever pivoted upon said wheel and having a pin adapted to be received in said pocket, a lever arranged when actuated to disengage said clutch-lever from said pocket, said lever provided with a projection arranged to engage the shoulder on said wheel, whereby, simultaneously with the disengagement of said clutch-lever, said wheel is arrested, and means for actuating said lever, as and for the purpose set forth.

28. In an apparatus of the class described, a stitching mechanism, actuating mechanism therefor including a clutch, a spring normally acting to release said clutch, a lever, a stop arranged to support said lever in position to hold said spring retracted, a stitching-thread-severing mechanism, means normally acting to move said severing mechanism to sever the thread, a latch for maintaining said severing mechanism in retracted position, means for releasing said stop, whereby said clutch is unclutched, and means actuated by the movement of said lever, when released, for releasing said latch, whereby said severing mechanism is actuated, and means for restoring all these parts to their initial positions, as and for the purpose set forth.

29. In a machine of the class described, the combination with a table arranged to receive thereon the material to be operated on, a clamping and transferring device comprising coöperating clamping-arms arranged to receive therebetween from the table a sufficient quantity of material to form a single mat, an endless carrier, means for revolving said clamping-arms to bodily transfer the mass of material to form a single mat from the table and deliver the same onto said carrier, a stitching mechanism, means for actuating the same, and means for imparting a step-by-step feed to said carrier to present the material to the action of said stitching mechanism, as and for the purpose set forth.

30. The combination with coöperating clamp-arms adapted to receive therebetween the material in sufficient quantity to form a single mat, a carrier, means for moving said clamp-arms to transfer said material to said carrier, means for opening and closing said clamp-arms to clamp and release said material, means for holding said clamp-arms in stationary position and against movement during the initial movement of said carrier to enable said carrier to properly receive said material, a stitching mechanism past which said carrier operates, and means for actuating these several parts, as and for the purpose set forth.

31. The combination with clamping-arms arranged in coöperating pairs, means for opening and closing the coöperating members of said pairs of arms to receive and clamp therebetween the material in sufficient quantity to form a single mat, a feed-carrier having projecting pins, means for moving said pairs of clamping-arms, with the material clamped therebetween, into position for the pins on said carrier to engage said material, means for holding said clamping-arms in stationary position during the initial movement of said carrier, a stitching mechanism past which said carrier operates, and means for actuating these several parts, as and for the purpose set forth.

32. The combination with clamping-arms arranged in coöperating pairs, a shaft upon which said arms are mounted, means for relatively moving the members of said pairs of arms to open and close the same, means for rocking said shaft to swing said clamping-arms into position to deposit the material clamped therebetween, a carrier to which said arms deliver, means for holding said clamping-arms in delivering position during the initial movement of said carrier, an auxiliary carrier arranged in parallel relation with respect to and over and above said first-mentioned carrier, said carriers forming a passage therebetween to receive the material, a stitching mechanism to which said carriers deliver, and means for actuating the several parts, as and for the purpose set forth.

33. The combination with a feed-carrier, of an auxiliary carrier arranged in parallel relation with respect thereto, and over said first-mentioned carrier, thereby forming a passage between said carriers, clamping-arms adapted to receive and clamp therebetween a sufficient quantity of the material to form a single mat, means for actuating said clamping-arms to deliver the material clamped therebetween upon the upper surface of said carrier and at a point in advance of said auxiliary carrier, means for holding said clamping-arms in delivering position during the initial movement of said carrier, a stitching mechanism to which said carrier delivers, and means for actuating these several parts, as and for the purpose set forth.

34. The combination with stitching and feeding devices, of a transferring mechanism comprising coöperating clamping-arms

adapted to receive therebetween the material in sufficient quantity to form a single cover, a shaft upon which said clamp-arms are mounted, means for relatively moving said clamp-arms to open and close the same, a drive-gear mounted on said shaft, a pawl for actuating said drive-gear, means for actuating said pawl to impart periodic rotation through definite distances to said shaft, whereby said clamp-arms are successively moved to receiving and delivering positions, a carrier to which said arms deliver, and a stitching mechanism past which said carrier operates, as and for the purpose set forth.

In witness whereof I have hereunto set my hand, this 29th day of March, 1899, in the presence of the subscribing witnesses.

VALENTINE FLECKENSTEIN.

Witnesses:
GRAHAM M. TORRANCE,
JUDSON LATTIN.