

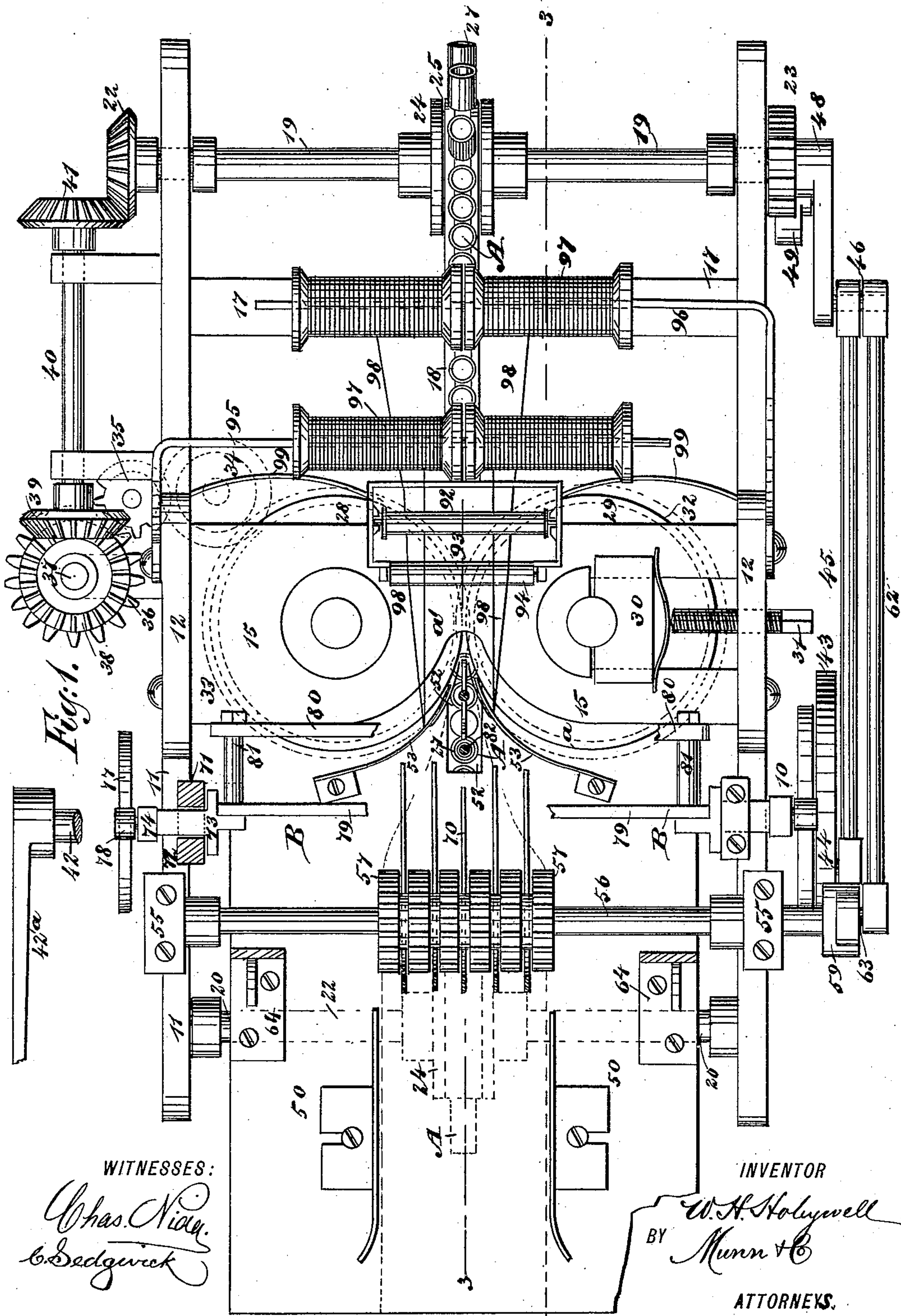
(No Model.)

5 Sheets—Sheet 1.

W. H. HOLEYWELL.
RUCHING MACHINE.

No. 465,177.

Patented Dec. 15, 1891.



(No Model.)

5 Sheets—Sheet 2.

W. H. HOLEYWELL.
RUCHING MACHINE.

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Fig. 2.

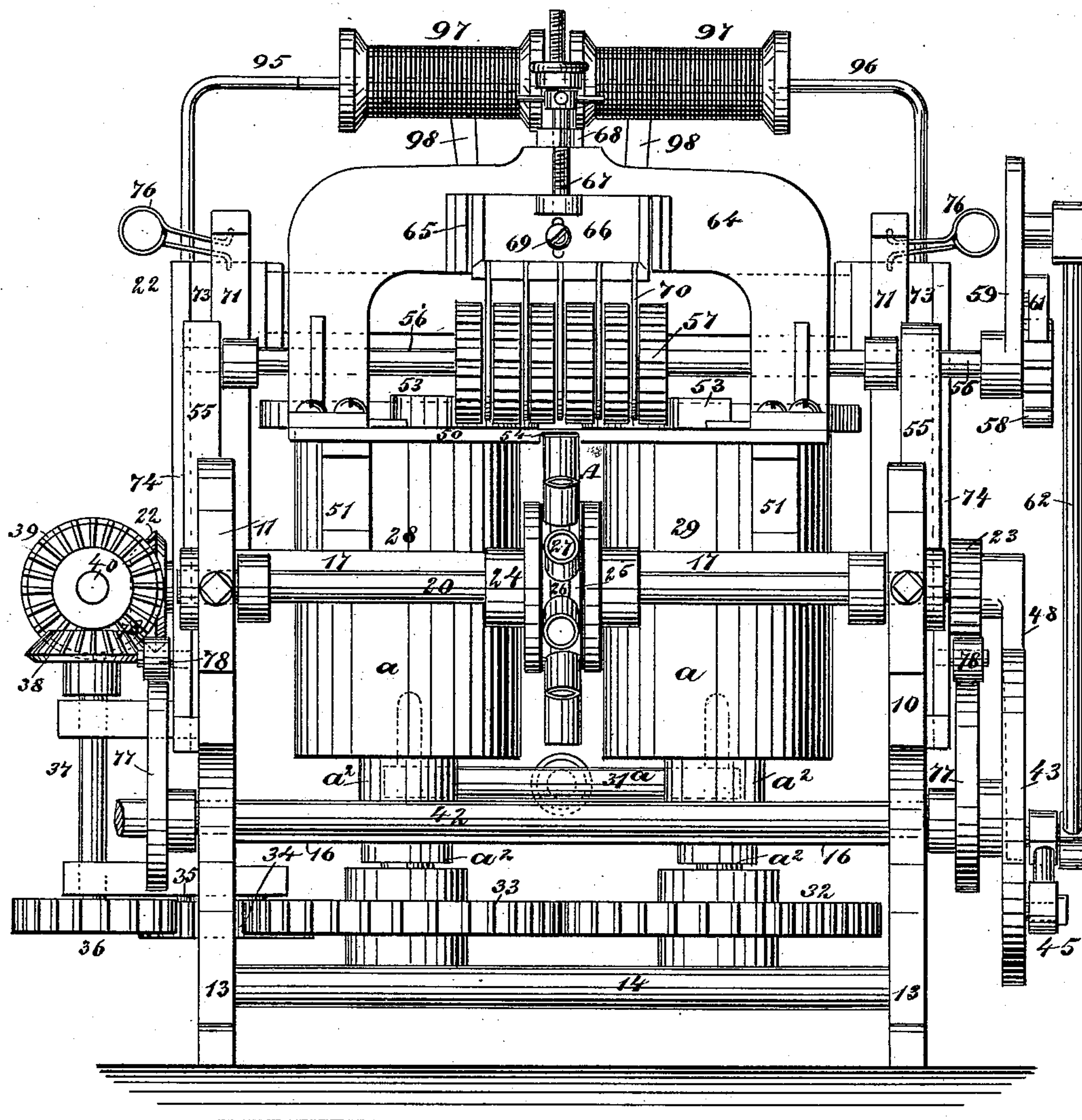


Fig. 6.

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C. Sedgwick



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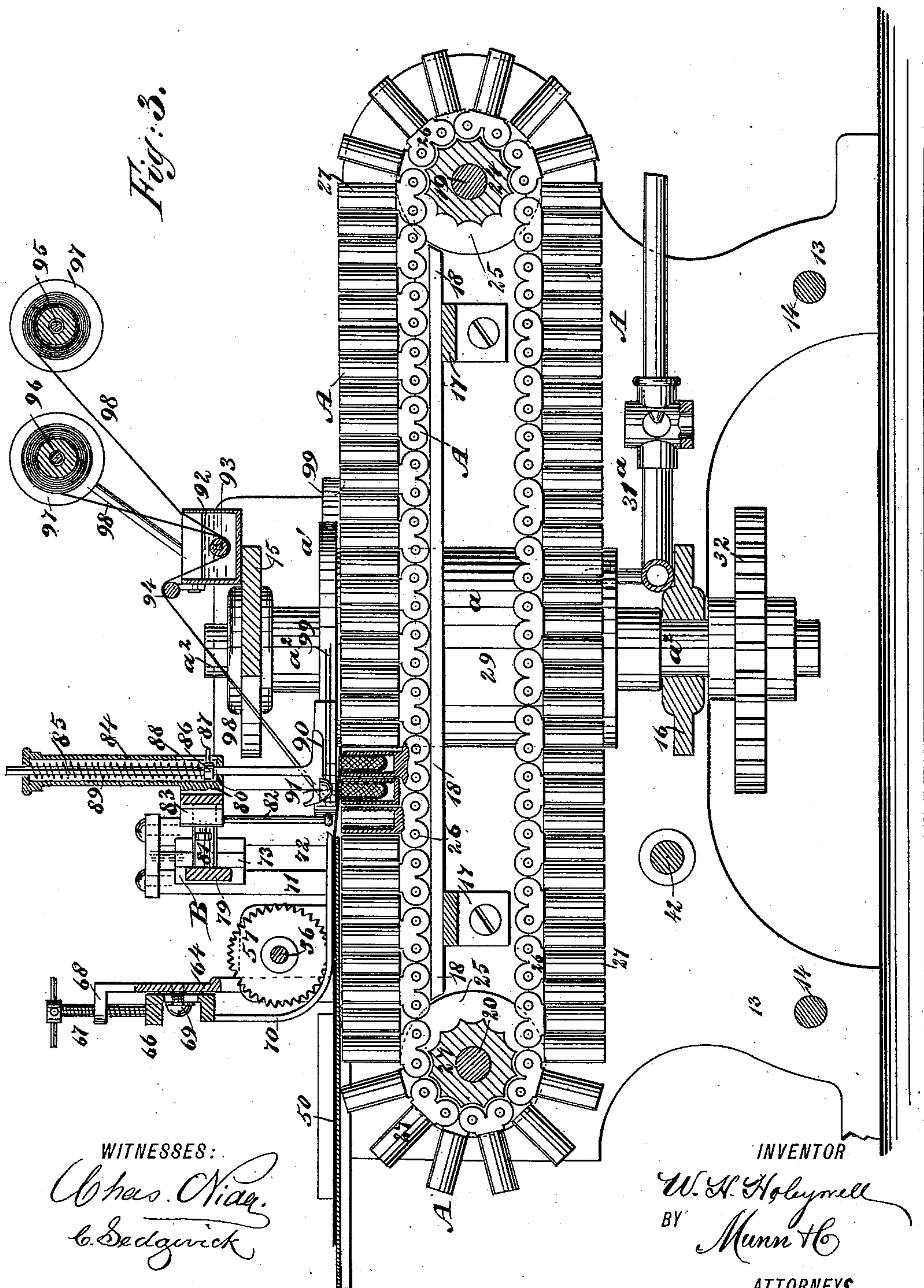
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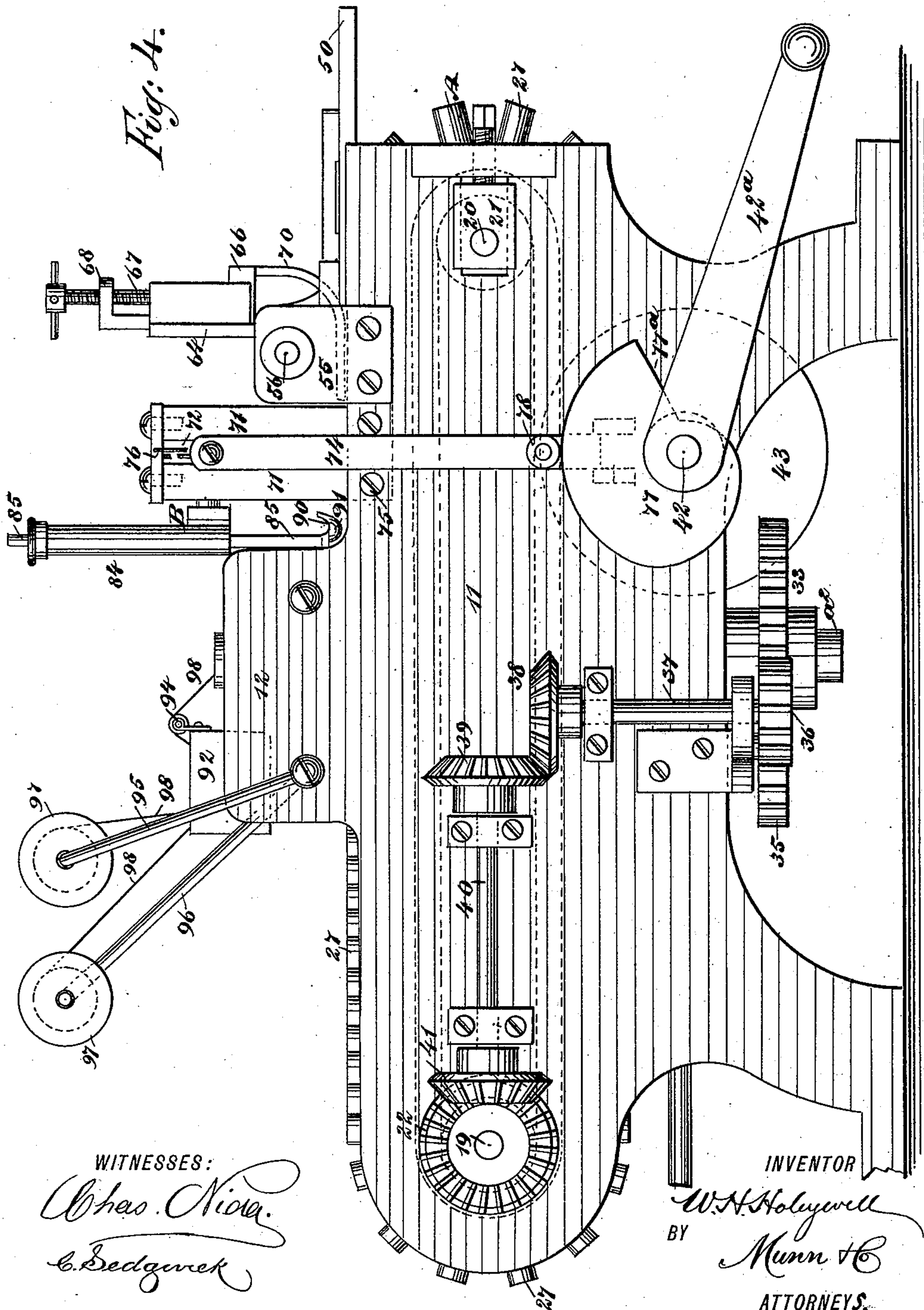
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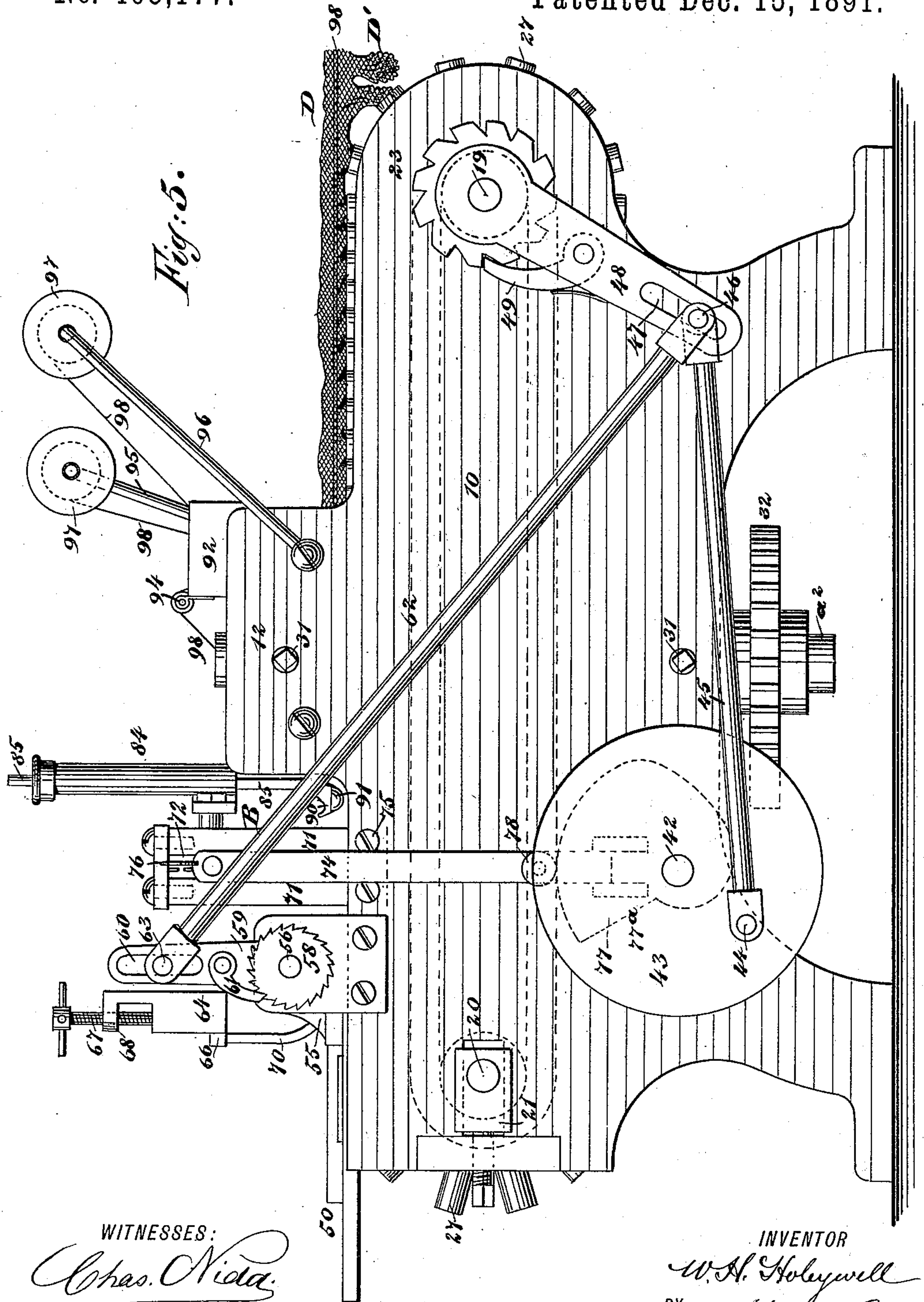
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UNITED STATES PATENT OFFICE.

WILLIAM H. HOLEYWELL, OF NEW YORK, N. Y., ASSIGNOR TO THE ESTATE
OF TILLIE BACK, OF SAME PLACE.

RUCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,177, dated December 15, 1891.

Application filed September 17, 1891. Serial No. 405,947. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY HOLEYWELL, of New York city, in the county and State of New York, have invented a new and
5 Improved Machine for Making Ruffles and Ruchings, of which the following is a full, clear, and exact description.

My invention relates to an improvement in machines for making ruffles, ruchings, and
10 similar trimmings, and has for its object to provide a machine of simple, durable, and economic construction comprising but few parts and capable when a strip of material is fed to the machine of automatically form-
15 ing therefrom a ruffle or ruching flat or puffed and providing integral with the body of the trimming a continuous strip to be utilized for the attachment of a suitable band.

The invention consists in the novel con-
20 struction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification,
25 in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the machine, a
30 portion of the presser-bar being broken away and the forming-bar and presser-foot being shown in section. Fig. 2 is a front end view of the machine. Fig. 3 is a longitudinal section taken, practically, on the line 3 3 of Fig. 1. Fig. 4 is an elevation of one side of the
35 machine, and Fig. 5 is an elevation of the opposite side, in this view the finished material being represented as passing from the machine; and Fig. 6 is a detail view of the completed ruffling or ruching.

40 The frame of the machine consists, mainly, of two side pieces 10 and 11, usually provided about centrally of their upper edges with vertical extensions 12 and upon their lower edges with legs 13. The side pieces are con-
45 nected at their legs through the medium of rods 14 or their equivalents, and at the extensions 12 by a transverse plate 15 and a second transverse plate 16, parallel with and below the upper one, the lower plate connect-
50 ing the sides at their lower edges. About midway of the height of the sides, between

the centers and ends, transverse bars 17 are permanently located, which transverse bars serve as a support for a longitudinal bar 18, placed centrally between the sides of the
55 frame, as shown best in Figs. 1 and 3. At or near the ends of the frame shafts 19 and 20 are respectively journaled, the shaft 20 being provided with adjustable bearings 21. (Shown in Fig. 4.) The shaft 19 extends be-
60 yond both sides of the machine and has secured upon one extremity a bevel-gear 22, and near its opposite end a ratchet-wheel 23 is keyed or otherwise attached, the teeth whereof face in the direction of the forward
65 end of the machine.

Upon each shaft 19 and 20, about midway between the sides of the frame, a drum 24 is firmly attached, turning with the shaft and provided with a peripheral groove 25. The
70 longitudinal bar 18, which is directly between the two drums, terminates at their grooved surfaces, as shown in Fig. 3. The drums are adapted to carry an endless chain A, made up of shaping cups or dies, and the bar 18
75 serves as a support for the upper series of the die-links of the chain between the drums. The grooved faces of the drums are shaped in accordance with the inner end contour of the
80 die-links engaging with such surfaces.

In the drawings the base-walls of the grooved surfaces of the drums are diametrically grooved or serrated, as is also best shown in Fig. 3, and the outer faces of the shank-sections 26 of the die-links are shaped to approxi-
85 mately simulate two contacting disks. Each die-link comprises a shank-section 26, above mentioned, and a body-section 27. The body-section is hollow and is open at the top, and it may be attached to the shank or base sec-
90 tion 26 or may constitute an integral portion thereof. Ordinarily the body-sections of the die-links are circular in cross-section and are closed at the bottom; but I desire it to be distinctly understood that the shape of the body-
95 sections in cross-section may be varied—as, for instance, they may be oval or polygonal—and the said body-sections may be open both at top and bottom, and the formation of the base or shank section, may likewise be changed in
100 general contour.

The base or shank section of each alternate

die-link is thicker than the one following, and a thin base or shank section is pivotally connected between two thicker corresponding sections, as is also best shown in Fig. 3, the pivotal engagement being so made that the disk-like projections of the receiving and received base-sections of the die-links overlap.

The inner faces of the body-sections of the die-links may be smooth or may be roughened in any suitable or approved manner. Preferably they are given the latter construction. The object of journaling the shaft 20 in adjustable bearings is to enable the slack of the chain to be taken up should such action become necessary.

Two vertically-placed irons 28 and 29 are located between the upper and lower plates 15 and 16, one at each side of the endless chain of die-links. The irons are of like construction, and each comprises a hollow body *a*, open at the bottom and closed at the top and provided at the upper end with a head-flange *a'* and a spindle *a''*, extending through the body beyond its top and bottom faces. The upper ends of the spindles *a''*, which are preferably made integral with the body of the irons, are journaled in the upper and lower tie-plates 15 and 16. One iron 28 is incapable of other than a rotary movement; but the other iron 29 is laterally adjustable, as its spindle is held to turn in boxes 30, movably located in the upper and lower tie-plates 15 and 16 and manipulated by set-screws 31 or their equivalents, as shown in Figs. 1 and 5. The body-sections of the irons are of sufficient length to extend below and slightly above the endless chain of die-links, that part of the iron bodies above the chain being their head-flanges *a'*, and the flanges of both irons revolve in engagement or in close proximity. The adjustment of one of the irons is produced in order that their head-flanges may be carried out of engagement or made to bear more or less snugly one against the other.

The irons are heated through the medium of a burner 31^a, which burner is preferably made essentially T-shaped and rests upon the bottom plate 16, the burner being provided with two tips, one tip entering each of the irons at the open bottom portion thereof. The burner may be supplied with gas, gasoline, or with any other heating agent capable of such use.

Beneath the lower tie-plate 16 the spindles of the irons have attached thereto gears 32 and 33, which gears are horizontally located and mesh one with the other, as shown in Fig. 2. The gear attached to the non-adjustable iron meshes with a pinion 34, which in turn meshes with a second pinion 35, both of these pinions being pivoted upon suitable projections upon the frame, and the pinion 35 is in mesh with a horizontal gear-wheel 36, fast upon the lower end of a vertical shaft 37, journaled in proper bearings secured to the side 11 of the frame. The upper end of this shaft carries a bevel-gear 38, which meshes

with a similar gear 39, secured to the forward end of a horizontal shaft 40, also journaled in bearings located upon the side 11 of the frame. The rear end of the horizontal shaft carries another bevel-gear 41, meshing with and of less diameter than the gear 22 upon the chain-driving shaft 19.

The irons have movement only when the chain of die-links is in motion. Therefore they are driven from the driving-drum or chain-shaft, the connection between the driving-shaft and the irons, as described and shown, being that preferred, although I do not confine myself to such an arrangement. The main drive-shaft 42 extends transversely of the frame, near the front of the machine, below the endless chain of die-links, and is journaled in the sides of the frame. This shaft is rotated through the medium of a suitable motor, a crank, or hand-wheel and at the side 10 of the frame has secured thereto a disk 43, carrying a wrist-pin 44, to which the forward end of a connecting-rod 45 is pivotally attached, the other end being connected in like manner with the pin 46, having sliding movement in a slot 47, produced in a crank-arm 48, loosely mounted upon the driving-drum or chain-shaft 19 outside of and preferably in engagement with the side face of the ratchet-wheel 23. The crank-arm carries a spring-pressed dog 49, which engages with the toothed surface of the ratchet-wheel, as shown in Fig. 5. From this connection between the main drive-shaft and the drive-shaft of the chain belt it will be observed that, while the movement of the main shaft may be continuous, that of the drive-shaft of the chain will be intermittent.

A table 50 is located at the front of the machine above the chain of die-links A, which table extends, preferably, beyond the forward end of the frame and is supported by brackets 51, attached to the forward cross-bar 17, as shown in Fig. 2. The inner end of the table is made to conform, substantially, to the contour of the irons below their head-flanges, and at the central portion of the table, in its inner or rear end, a longitudinal opening 52 is produced of slightly greater width than the diameter of the body-sections 27 of the die-links. The table is ordinarily made of less width than the width of the space between the sides of the frame, as shown in Fig. 1. The opening 52 exactly registers with the space between the opposed irons, and the table at each side of the opening is provided with a vertical guard-flange 53, each semicircular in general contour, one being located adjacent to each iron and extending upward essentially flush with the upper surface thereof. Each guard-flange is provided with an aperture at a predetermined point in its length for the reception of threads, to be hereinafter described, and as is best shown in Fig. 1.

It is preferable that the upper ends of the die-links when they present themselves at

the opening 52 in the table should be practically flush with the upper face of the latter, and to that end a longitudinal groove 54 is made in the central under portion of the table, in which groove the links of the chain enter as they ascend.

Journal-boxes 55 are located upon the sides 10 and 11 of the frame, near their forward ends, in which boxes a feed-shaft 56 is journaled. The feed-shaft carries a series of feed-wheels 57, rigidly secured thereon and spaced a slight distance apart by forming hubs upon the wheels or by interposing washers. These feed-wheels are adapted to engage with the material placed upon the table and which is to be converted into rucking or ruffling and feed said material forward at a proper rate of speed.

The feed-shaft has direct movement from the driving-shaft of the chain of die-links and moves in unison therewith, and the connection between the two shafts is effected in the following manner: Upon the side 10 of the machine the feed-shaft projects some little distance, and has fastened thereon a ratchet-wheel 58, and preferably between the ratchet-wheel and the contiguous bearing 55 of the shaft a crank-arm 59 is loosely mounted upon the feed-shaft, provided at its upper end with a longitudinal slot 60 and with a spring-pressed dog 61, which dog is in constant engagement with the teeth of the ratchet-wheel, as shown in Fig. 5. The forward end of a connecting-rod 62 has a sliding connection with the crank-arm 59, which is effected through the medium of a pin 63, secured to the connecting-rod and passed through the slot in the crank-arm 59 in a manner to have movement therein, and the rear end of the connecting-rod 62 is pivotally connected with the crank-arm 48 of the driving-drum or chain-shaft 19 through the medium of the pin 46, utilized to pivotally connect the connecting-rod 45 with the said crank-arm, as is best shown in Figs. 1 and 5.

It will be observed that by reason of the connection between the feed and the driving shaft of the chain belt the feed-shaft will have movement only when the chain of die-links and the irons are in motion.

In front of the feed-shaft 56 a yoke 64 is erected upon the table 50. This yoke upon the outer face of its body portion is provided with a slideway 65, of any approved formation, in which a block 66 is located, capable of vertical movement, and the adjustment of the block, either up or down, is ordinarily effected by swiveling in the upper face of the block, at its center, the lower end of a screw 67, which screw passes upward through a threaded aperture in a bracket-arm 68, projected forwardly from the top of the yoke, and the screw is revolved in any suitable way. The block 66 is also provided with a set-screw 69, whereby it may be rigidly held in place after it has been adjusted. The block is adapted to carry a series of presser-

arms 70, which arms are secured to the block at their upper ends and extend downward in front of the spaces between the feed-wheels and through said spaces over the table some distance rearward of the wheels, the central presser-arm being shortened, so as not to extend over the opening 52 in the table.

Between the bearings for the feed-shaft and the extensions 12 of the frame a standard 71 is erected upon each side piece 10 and 11, provided with a vertical slot or slideway 72, and in each slot or slideway a block 73 has vertical movement, said blocks being preferably made somewhat cruciform in cross-section and plan, as shown in Fig. 1. The cross-arms of the blocks are located at the inner sides of the standards, and the outwardly-extending arms of the blocks have secured thereto downwardly-projected slide-bars 74, moving between suitable guides 75 upon the outer side pieces of the frame.

Springs 76, of any approved or desired type, are located between the upper surfaces of the blocks and bearings located at the upper ends of the standards—the caps of the standards, for instance. The function of the springs is to force the blocks quickly downward to their lowermost position when upward pressure upon them is removed.

The blocks 73 are carried upward through the medium of cams 77, one being secured upon each outer extremity of the main drive-shaft. The cams, as shown in Fig. 4, have the major portion of their peripheries shaped, essentially, as the fragment of an oval; but in one portion of the periphery a recess 77^a is produced, one wall of which is quite steep, being slightly inclined, and the other wall is cylindric, merging gradually into the oval section. The engagement between the cams and the slide-bars 74 of the blocks is effected by a contact of friction-rollers 78, located at the lower ends of the bars, with the peripheries of the cams, as shown in Figs. 1 and 4, from which it will be observed that while the rollers travel upon the oval faces of the cams the blocks will be raised and held elevated; but as soon as the recessed portion is reached the rollers will fall suddenly and the blocks will as quickly drop downward, forced to that position by their springs 76.

The blocks 73 form a portion of a shaping-head B, the remainder of which consists of a transverse bar 79, secured to the inner arms of the blocks, as shown in Fig. 1, and a second parallel and shorter bar 80, held a slight distance to the rear, near the side extensions 12 of the frame, by means of studs 81. A shaping-bar or plunger 82 is adjustably held in a socket 83, formed upon the forward central surface of the rear bar 80 of the head, the position of the plunger or shaping-bar being such that it is held directly over the endless chain of die-links and the opening 52 in the table, through which said links are visible. At the rear central portion of the shorter bar of the head a cylinder 84 is secured, prefer-

ably near its lower end. A presser-bar 85 passes through the cylinder, and within it is provided with a collar 86, having an attached pin 87 extending through a slot 88 in the cylinder, as shown in Fig. 3. Above the collar the presser-bar is surrounded by a spring 89, which normally forces it downward, and at its lower end the presser-bar has formed thereon a presser-foot 90. The presser-foot is horizontal and is adapted to engage longitudinally with the upper ends of the die-links of the endless chain. At its forward end, upon its under face, the presser-foot has formed thereon a knob 91, corresponding in shape to the cross-sectional contour of the body of each link of the chain, as when the presser-bar is forced downward the knob 91 of the presser-foot is adapted to enter the body portion of one of the links, while the remaining portion of the foot has a bearing upon the tops of the links at the rear of the one entered. Both the shaping bar or rod 82 and the presser-foot descend at the same moment; but the shaping-bar is elevated in advance of the presser-bar and the presser-foot is not removed from the chain of dies until the shaping bar or rod has virtually passed out of the link in which it had been entered. Immediately in front of the presser-bar the upper tie-plate 15 is provided with a recess, which discloses to the operator looking down upon the machine the die-links of the chain as they are presented at the opening 52 in the table and which are being operated upon.

At the rear central portion of the upper tie-plate 15 a box or like receptacle 92 is located adapted to contain adhesive material. In this box a block of absorbent material is located or a roller 93 is journaled, and a second roller 94 or a round bar is located at the front upper side of the box, as is shown in Fig. 3.

From opposite sides of the frame angle-arms 95 and 96 are upwardly projected, and upon the horizontal members of the arms spools 97 are loosely placed, containing thread 98. Two spools are ordinarily placed upon each arm, as shown in Fig. 1, and the threads from both sets of spools are carried beneath the roller 93 in the box containing adhesive material and upward from the box, from whence the threads from one set of spools are carried in direction of one side of the machine and the threads from the other set of spools in the direction of the opposite side of the machine, as shown in Fig. 1. Thus the threads are carried at each side of the opening 52 in the table. They are thence passed forwardly through the apertures heretofore alluded to in the guard-plates 53 upon the table, as is likewise shown in Fig. 1, and thence rearwardly in engagement with the guard-plates to an engagement with the head-flanges of the irons and out therefrom.

In order that the trimming or ruching when finished may not cling to the irons and be thereby injured, curved guard-arms 99 are carried from the sides of the machine, at the

rear of the irons, in the direction of the center and inward virtually to a contact with the heads of the irons.

With reference to the operation the position of the parts in the accompanying drawings represents the presser-foot and plunger as elevated free of the chain, the crank-arm 59 of the feed-shaft having assumed an essentially vertical position and the corresponding arm 48 of the drum or chain-shaft a forwardly-inclined position. The material to be operated upon is mull, crêpe lisse, tulle, silk, or other fabric, which may have been previously fluted or crimped, and this material is fed to the feed-wheels between suitable guides located upon the table.

For the purpose of illustration I will assume that one ornament or member of the trimming has been formed. At the further revolution of the main drive-shaft the rollers 78 of the shaping-head will continue to travel upon the side track of the elliptical portion of the cams 77, and will thereby maintain the head in an elevated position. At the same time the main drive-shaft, through the medium of the connecting-rods 45 and 62, will have revolved the feed-shaft and driving-drum or chain-shaft through the medium of their respective ratchets and dogs and the material to be operated upon will be fed forward by the feed-wheels, when the chain will be moved forward a distance equivalent to the diameter of a link-body in the die-chain, and the irons will be revolved and will press the threads 98, which pass in contact with opposite sides of the flattened section or strip D above the formed pattern of the trimming, and will iron said strip flat and hold it in that position by forcing the gummed threads into or upon it and simultaneously drying them. The moment that this is accomplished the cams 77 on the main drive-shaft will have revolved a sufficient distance to present to the rollers 78 of the extension-arms 74 of the shaping-head their recessed portions, and the rollers and extension arms or bars will thereupon drop and will carry the head quickly downward with them. Just prior to this movement of the shaping-head the crank-arms 59 and 48 will be upon their backward throw, and consequently the chain of dies, the feed-shaft, and the irons will be stationary. When the shaping-head is forced downward, the knob 91 upon the presser-foot will enter the die-link in which the last pattern of the trimming or ruching has been formed and will hold it therein. At the same time the plunger will force the material which is over the next forward die-link downward into the same, sufficient slack for this purpose having been provided in the feed of the machine. Just as soon as the plunger has forced the material into the die-link over which it was located the cams 77 upon the main drive-shaft will have revolved a sufficient distance to cause the rollers 78 of the extension arms or bars of the head to engage

with and travel upon one side of the partially-elliptical periphery of the cams, and the moment this contact occurs the shaping-head will be forced upward and will carry with it the plunger 82; but the presser-foot will still remain in position upon the chain of die-links, being held thereon by the spring 89 until the shaping-head has been raised such a distance as to cause the pin 87 upon the collar of the presser-bar to engage with the lower wall of the slot in the cylinder 84, in which said bar has movement. When this position has been reached, which is at a time when the plunger is entirely removed from the link into which it has pressed the material, a further upward movement of the shaping-head will cause the cylinder to carry upward the presser-bar and consequently remove the foot from the chain. This action takes place when the rollers 78 are passing over the end elliptical portions of the cams, or those portions farthest removed from the pivots, and at that time the ratchets will act through the medium of the drive-shaft upon the feed-shaft and the driving-drum or chain-shaft and the chain will be moved forward the distance of a link, as stated at the outset in this explanation of the operation, and the irons and feed-wheels will be set in motion. When the material is forced down into the die-links, a strip is formed above the links, caused by the two outer edges of the strip of material from which the ruching or ruffling is to be made being brought together, and with opposite sides of this shank or strip portion of the ruching the gummed threads 98 are engaged. This portion of the ruching is ironed between the head-flanges of the irons, and at the same time the threads are firmly and evenly pressed in or upon the sides of the strip or shank and the adhesive material carried thereby is dried, firmly binding them in the desired position.

The object of providing the presser-foot with the knob 91 is, by entering the knob into the die-link adjacent to that to be operated upon, to hold the shaped material in the die-link covered by the presser-foot, and thereby prevent the tension necessarily exerted upon the fabric by the plunger in pressing it down from drawing the formed pattern out of its die, and the object of maintaining the presser-foot in its lower position until the plunger has been carried out of its die is to prevent any possibility of the shaped pattern being disturbed should the plunger by chance engage with the sides of its die-link.

As the machine operates, the finished material is delivered at the rear in a continuous strip, said material comprising the shank or strip section D and the body or pattern section D', which when the die-links are circular in cross-section will be tubular or hollow and shaped to simulate a complete shell—that is, a shell with two convex sides, each side having the usual rib formation of a shell.

The product is shown in Fig. 6, and after

the product leaves the machine a band D² is sewed or otherwise attached to and made to encircle or inclose or conceal the shank or strip section of the ruching.

It is obvious that the machine for such a purpose as is intended is exceedingly simple, that it is automatic in its action after the material to be acted upon has been engaged with its feed-rollers, and that the time or intermittent movements of the various mechanisms of the machine are both sure and positive as well as automatic.

I desire it to be distinctly understood that, if in practice it is found desirable, the feed mechanism may be omitted or other forms of feeding devices may be employed, and that the arms carrying the thread reels or spools and the receptacle containing the adhesive material may be differently located.

It will be observed by reference to Fig. 6 that the product of the machine consists of a grouping or chain of figures, each simulating a complete ribbed shell and having an inflated or somewhat cylindrical appearance when viewed from the sides, tops, or edges, and that all of the shell-like figures apparently form a portion of a common base.

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

1. In a ruching-machine, the combination, with the traveling chain composed of a series of tubular dies pivoted together, of a plunger reciprocating at a right angle to the plane in which a portion of said chain travels beneath it, and the spring-actuated presser-foot bearing and sliding on the open ends of the traveling dies, as shown and described.

2. In a machine for the manufacture of ruffles, ruchings, or like trimmings, a chain or belt composed of a series of die-links, a spring-pressed plunger located above and entering the links of the belt or chain, and an alternating driving mechanism connected with and operating the chain or belt and the plunger, substantially as described, whereby when the chain is stationary the plunger is in operation, as set forth.

3. In a machine for the manufacture of ruchings, ruffings, and like trimmings, a chain or belt of die-links, a plunger entering said links, a presser-foot engaging with the links in advance of the plunger, and an actuating mechanism operating simultaneously upon the plunger and presser-foot in one direction and upon one in advance of the other in another direction, substantially as described.

4. In a machine for the manufacture of ruffles, ruchings, and like trimmings, a chain or belt of die-links, a plunger entering said links, a presser-foot operating in conjunction with the plunger, irons operating in conjunction with the die-links, and a time mechanism imparting a stop motion alternately to the die-links and the irons and to the presser-foot and plunger, substantially as shown and described.

5. In a machine for the manufacture of ruffles, ruchings, and similar trimmings, vertically-disposed tubular heating-irons provided with flanged heads, one adjustable toward the other and adapted for engagement with opposite sides of the trimming, guards leading to and from the irons, and means for supplying threads coated with adhesive material, and guides for directing said threads between the heads of the irons and the trimming, as and for the purpose set forth.

6. In a machine for the manufacture of ruffings, ruchings, and like trimmings, the combination, with a series of dies having a pivotal connection and a chain-like connection, said dies comprising a base and a hollow body having an opening to receive the material to be acted upon, of a plunger and presser-foot, one pressing the material into a die, while the other presses upon a contiguous die, as and for the purpose set forth.

7. In a machine for the manufacture of ruffings, ruchings, and like trimmings, the combination, with a series of dies having a chain-like connection, each die having a hollow body open to receive the material to be acted upon, of a shaping-head comprising a plunger and a presser-foot, the former forcing the material into a die and the latter maintaining the finished trimming safely within a contiguous die or dies, and a driving mechanism imparting movement to the dies when the plunger and the presser-foot are raised, as and for the purpose set forth.

8. In a machine for the manufacture of ruffles, ruchings, and like trimmings, the combination, with a shaping-head carrying a

plunger and a presser-foot, and a series of dies having movement beneath the shaping-head, of a feed mechanism and vertically-disposed irons located one at each side of the series of dies, all operating substantially as shown and described.

9. In a machine for the manufacture of ruchings, ruffings, and like trimmings, the combination, with a series of dies having a pivotal link-like connection, each of said dies consisting of a base and a body portion hollow and provided with an opening to receive the material to be operated upon, and a shaping-head comprising a plunger and presser-foot located above the chain of dies, of irons located one at each side of the chain of dies at the rear of the shaping-head, a drive-shaft, and driven shafts connected with the drive-shaft, the said driven shafts actuating the chain of dies and the irons and the shaping-head one in advance of the other, the shaping-head remaining stationary while the dies and the irons are in operation, substantially as shown and described.

10. In a ruching-machine, vertically-disposed rotary hollow and heating irons adapted for engagement with opposite sides of the trimming, means for supplying threads carrying adhesive material, and guides for directing said threads in the required directions between the trimming and the irons, as shown and described.

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Witnesses:

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