No. 894,192.

PATENTED JULY 28, 1908.

A. DANSEREAU.

MACHINE FOR MANUFACTURING TAGS.

APPLICATION FILED JULY 14, 1906.

10 SHEETS—SHEET 1.

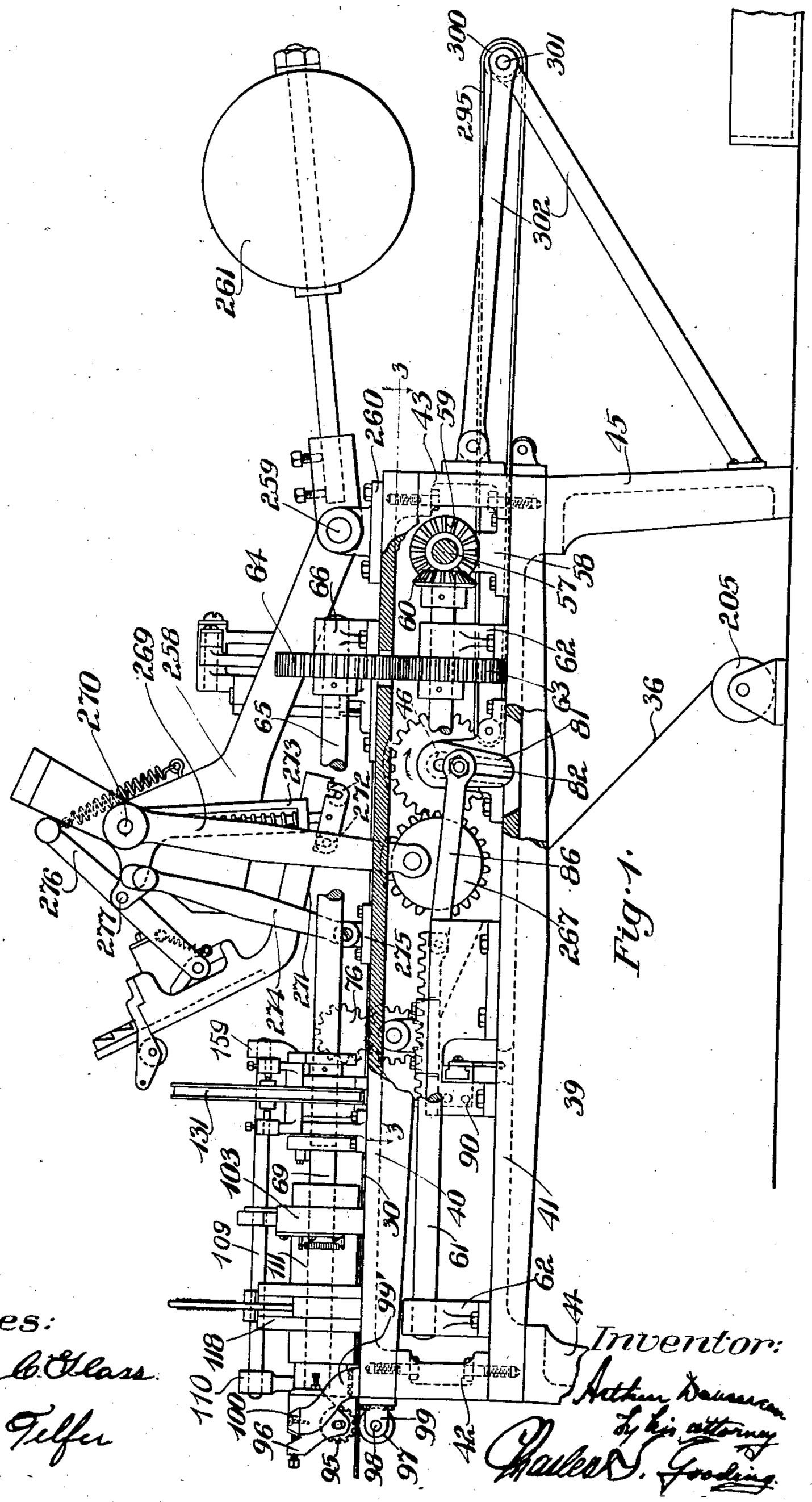

Fig. 1.

Witnesses:
William C. Glass.
Ernest A. Telfer.

Inventor:
Arthur Dansereau
by his attorney
Walter D. Gooding.

No. 894,192. PATENTED JULY 28, 1908.

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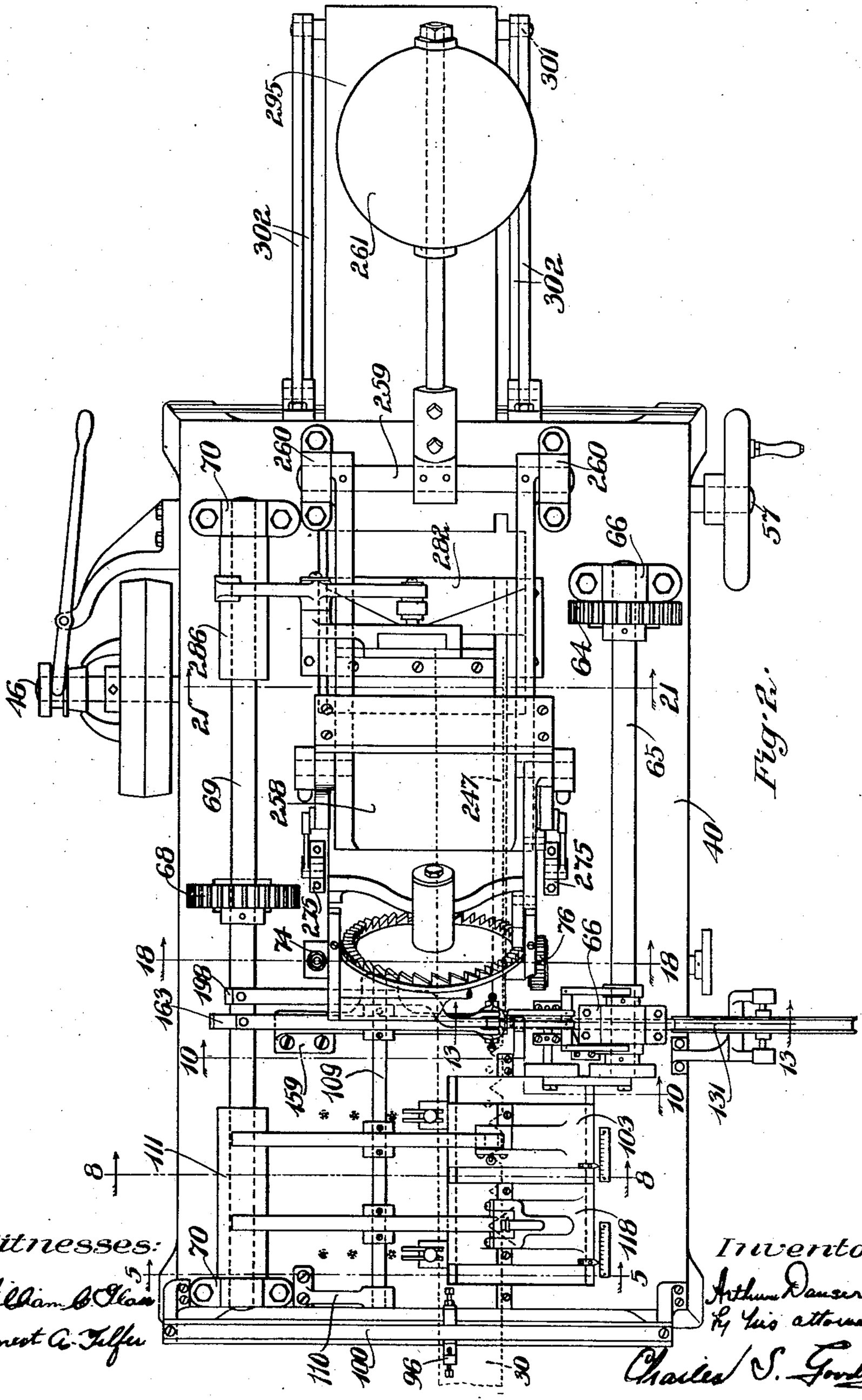

Fig. 2.

Witnesses:
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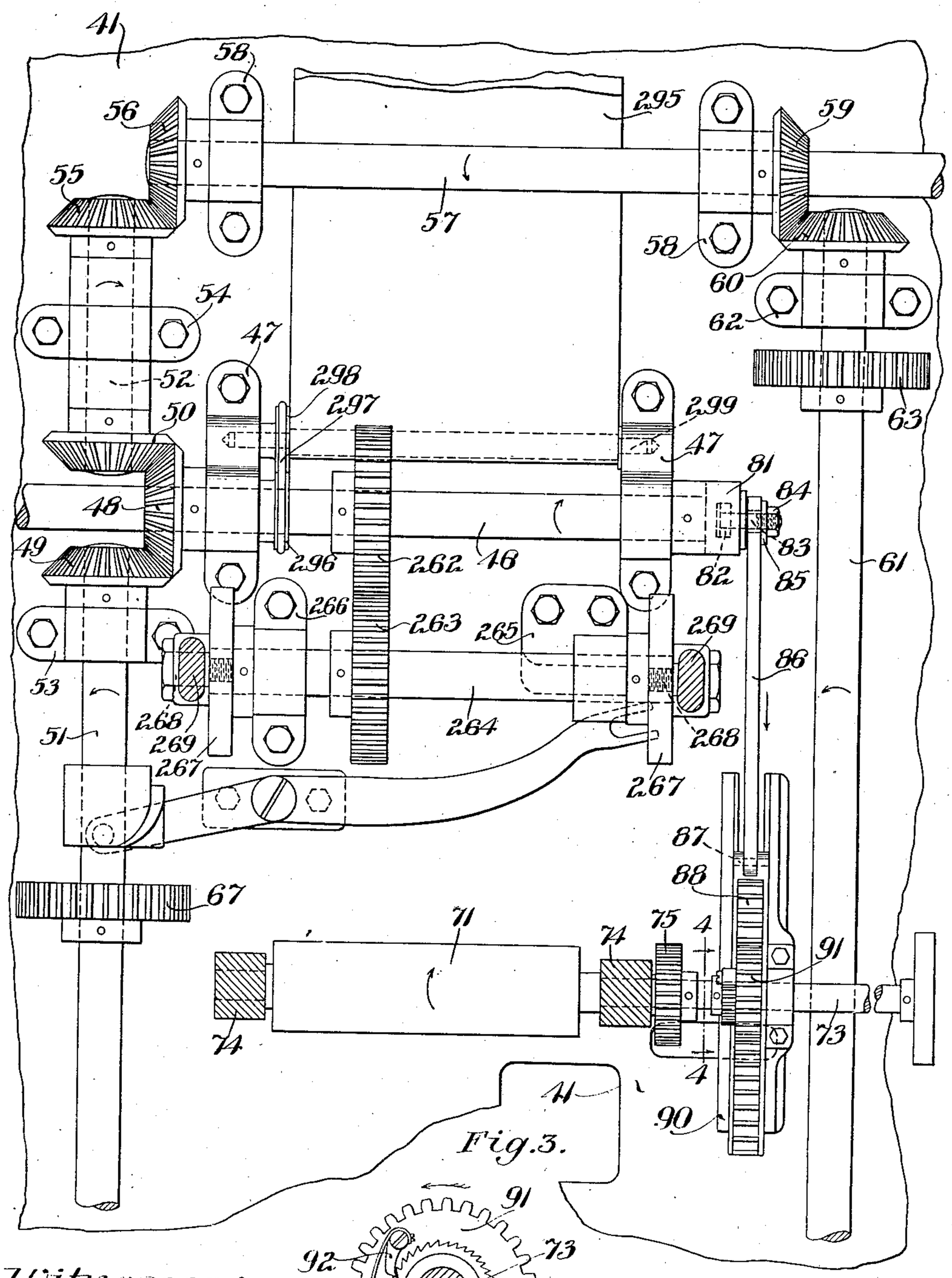

Fig. 3.

Fig. 4.

Witnesses:
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Inventor:
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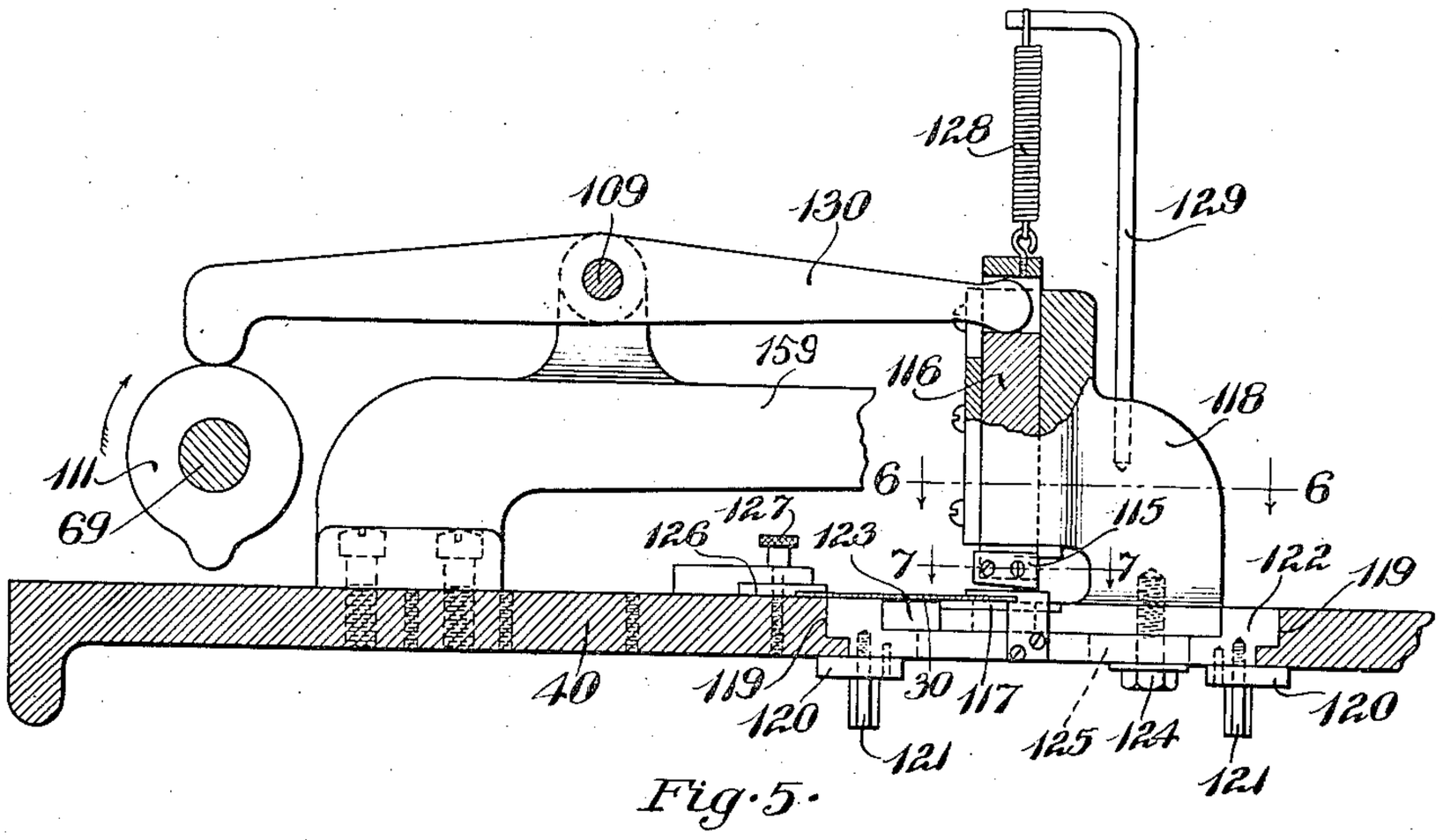

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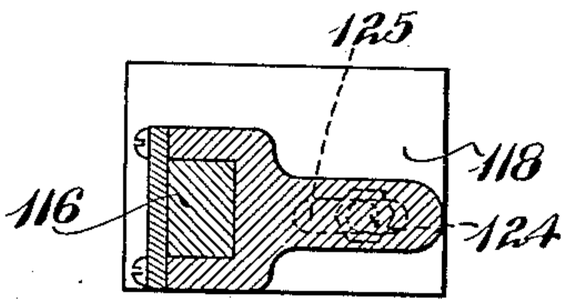

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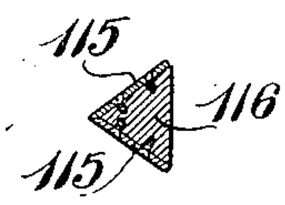

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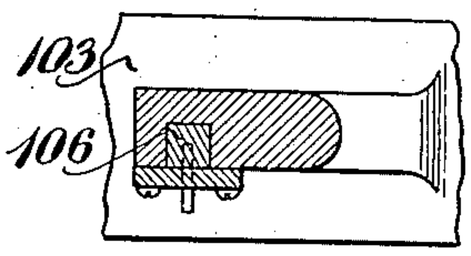

Fig. 9

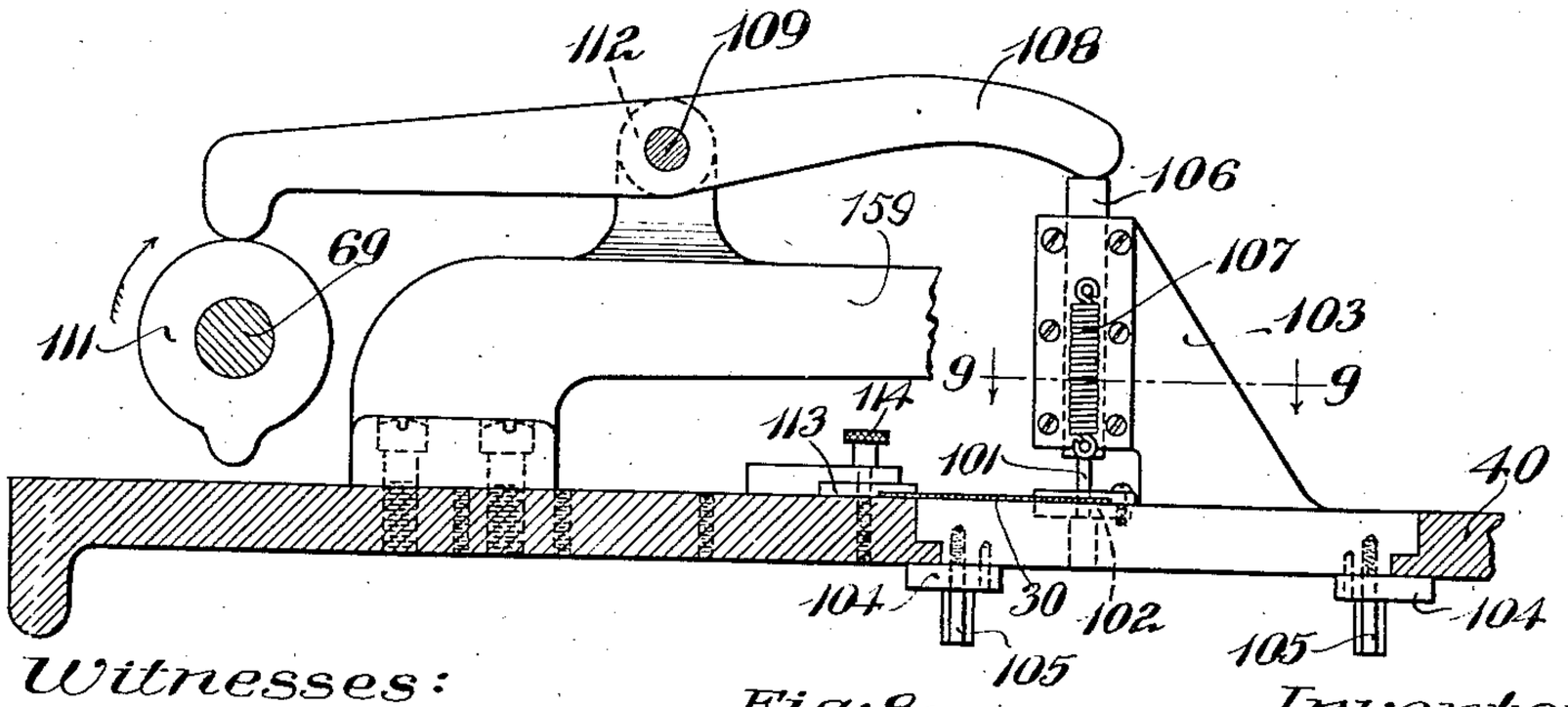

Fig. 8.

Witnesses:
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Ernest A. Telfer

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10 SHEETS—SHEET 5.

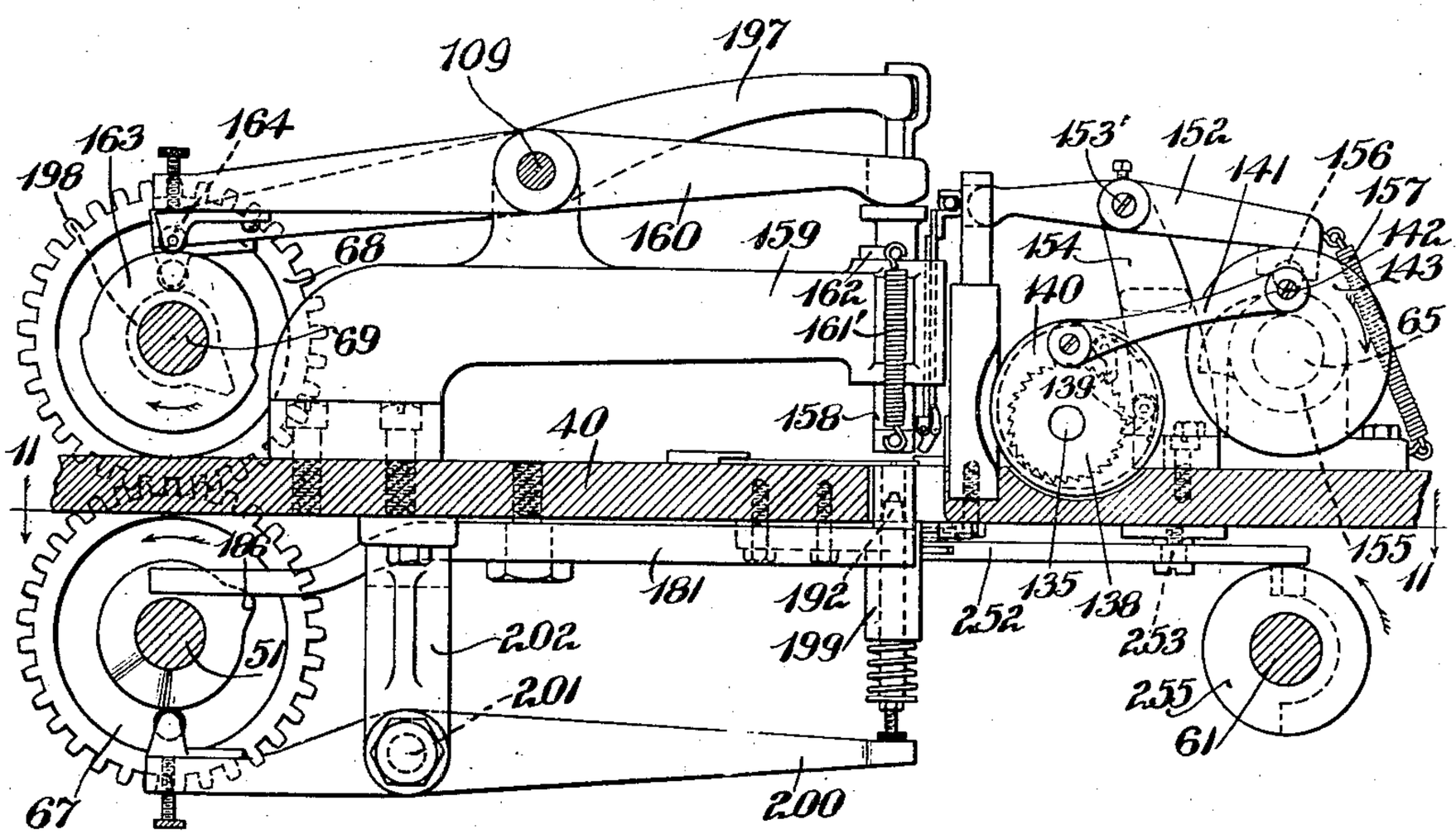
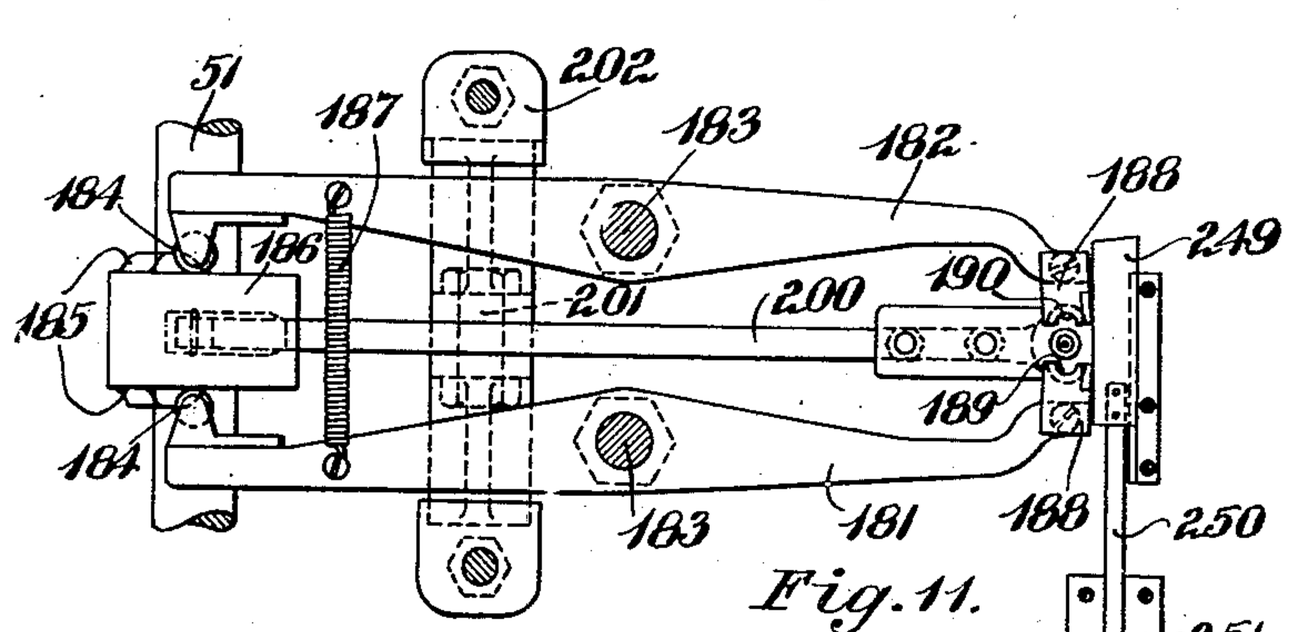


Fig. 10.



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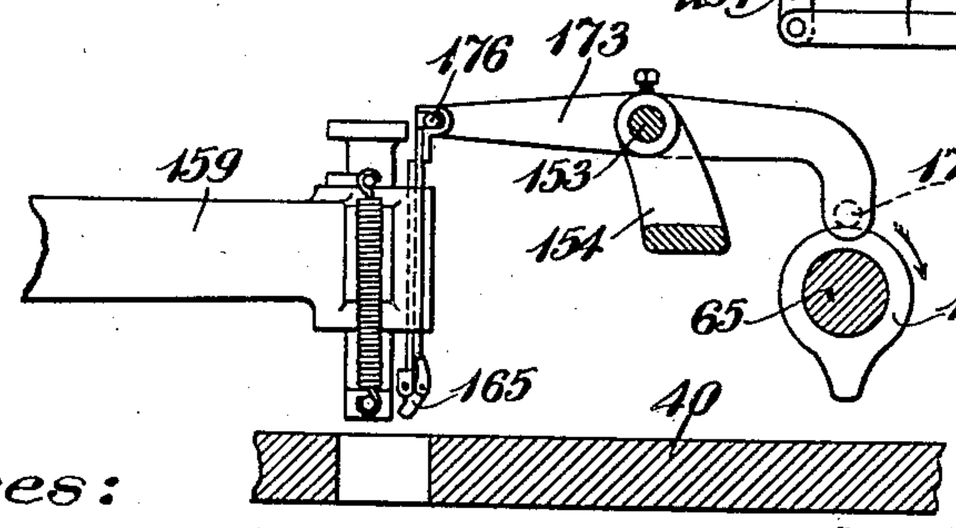

Fig. 12.

Witnesses:
William C. Glass.
Ernest A. Telfer

Inventor:
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by his attorney, Charles J. Gooding.

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A. DANSEREAU.

MACHINE FOR MANUFACTURING TAGS.

APPLICATION FILED JULY 14, 1906.

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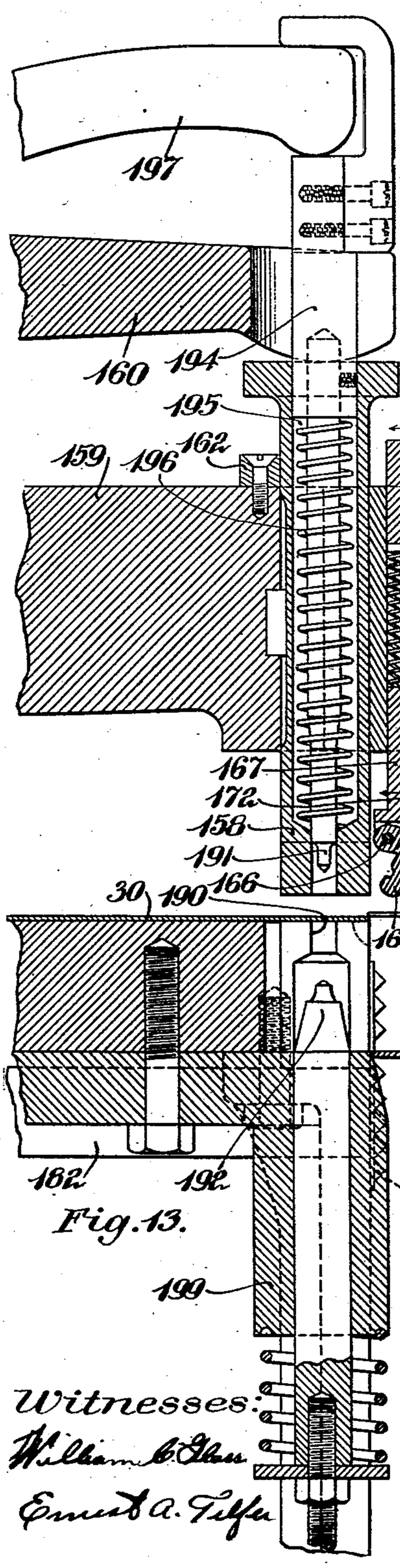

Fig. 13.

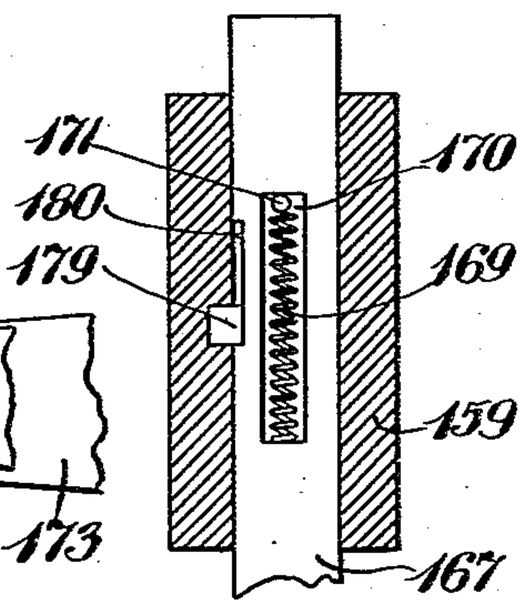

Fig. 14.

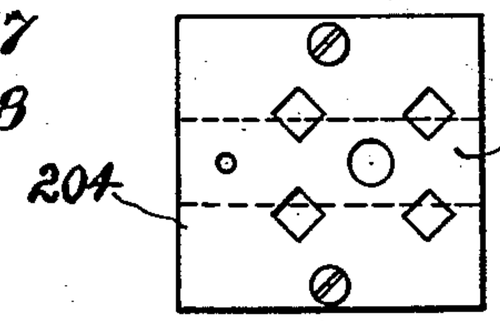

Fig. 15.

Witnesses:
William C. Glass
Ernest A. Tilfer

Inventor:
Arthur Dansereau
by his attorney,
Charles J. Goodwin.

No. 894,192. PATENTED JULY 28, 1908.

A. DANSEREAU.

MACHINE FOR MANUFACTURING TAGS.

APPLICATION FILED JULY 14, 1906.

10 SHEETS—SHEET 7.

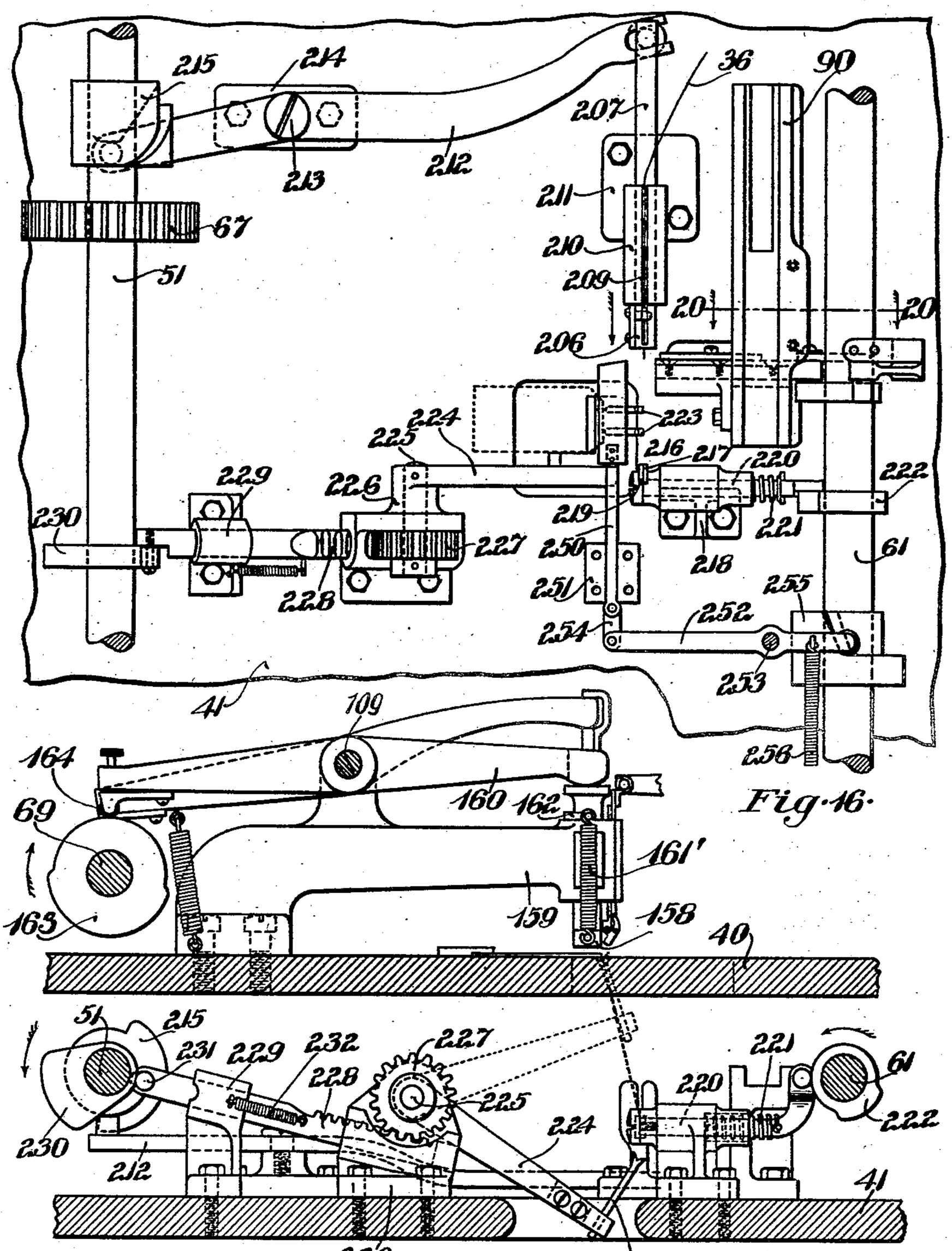

Fig. 16.

Fig. 17.

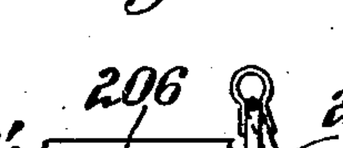

Fig. 16'.

Witnesses:

William C. Glass

Ernest A. Telfer

Inventor:

Arthur Dansereau

by his attorney.

Charles S. Fooding.

No. 894,192. PATENTED JULY 28, 1908.

A. DANSEREAU.

MACHINE FOR MANUFACTURING TAGS.

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10 SHEETS—SHEET 8.

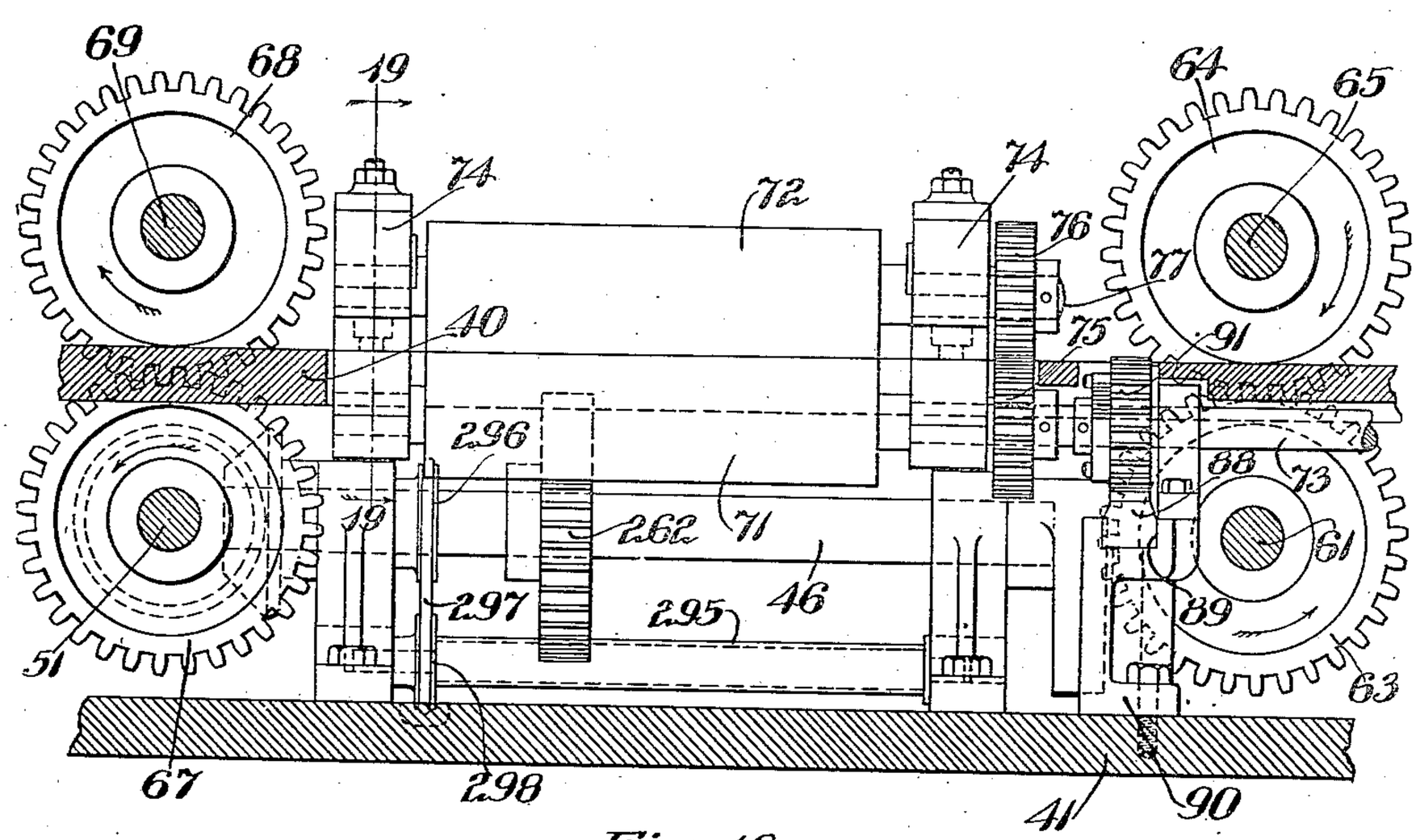


Fig. 18.

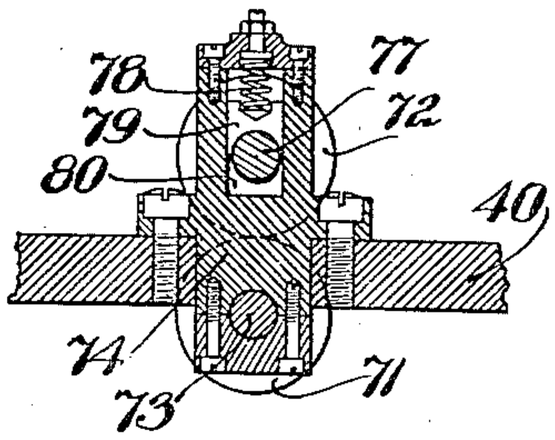
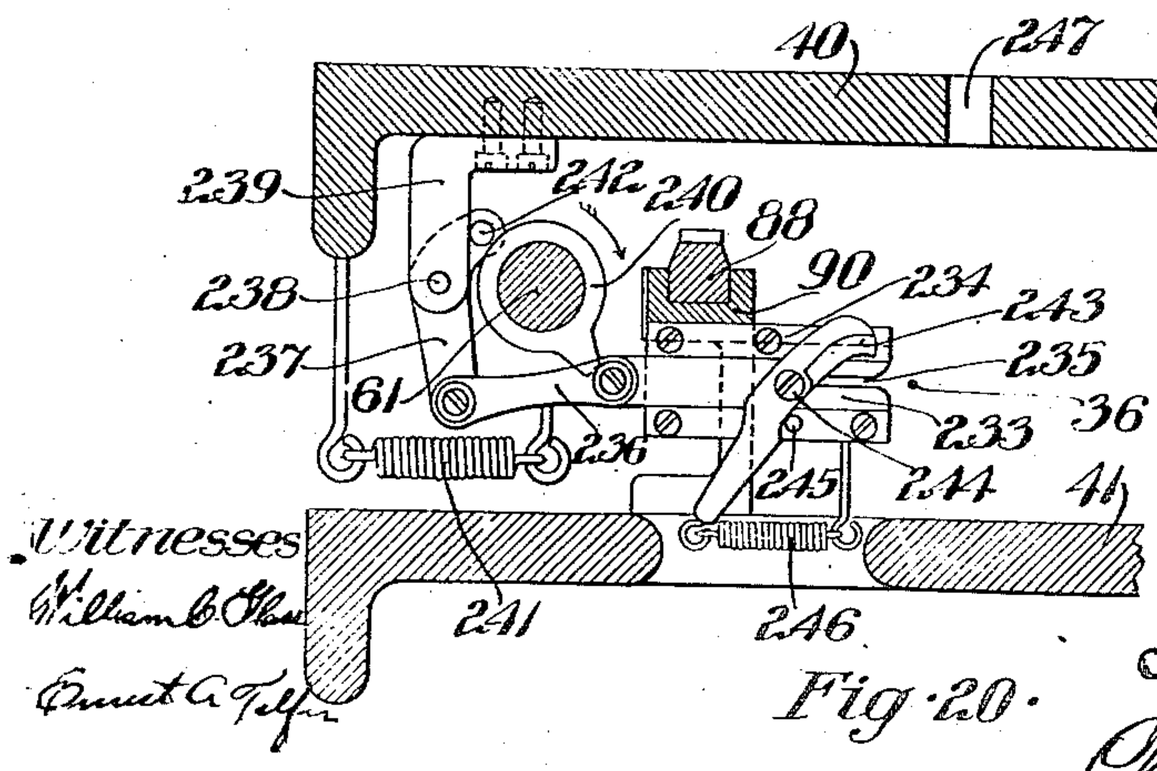


Fig. 19.



Witnesses
William C. Gleason
Ernest A. Telfer

Fig. 20.

Inventor:
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by his attorney
Charles S. Goodwin.

No. 894,192. PATENTED JULY 28, 1908.

A. DANSEREAU.

MACHINE FOR MANUFACTURING TAGS.

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10 SHEETS—SHEET 9.

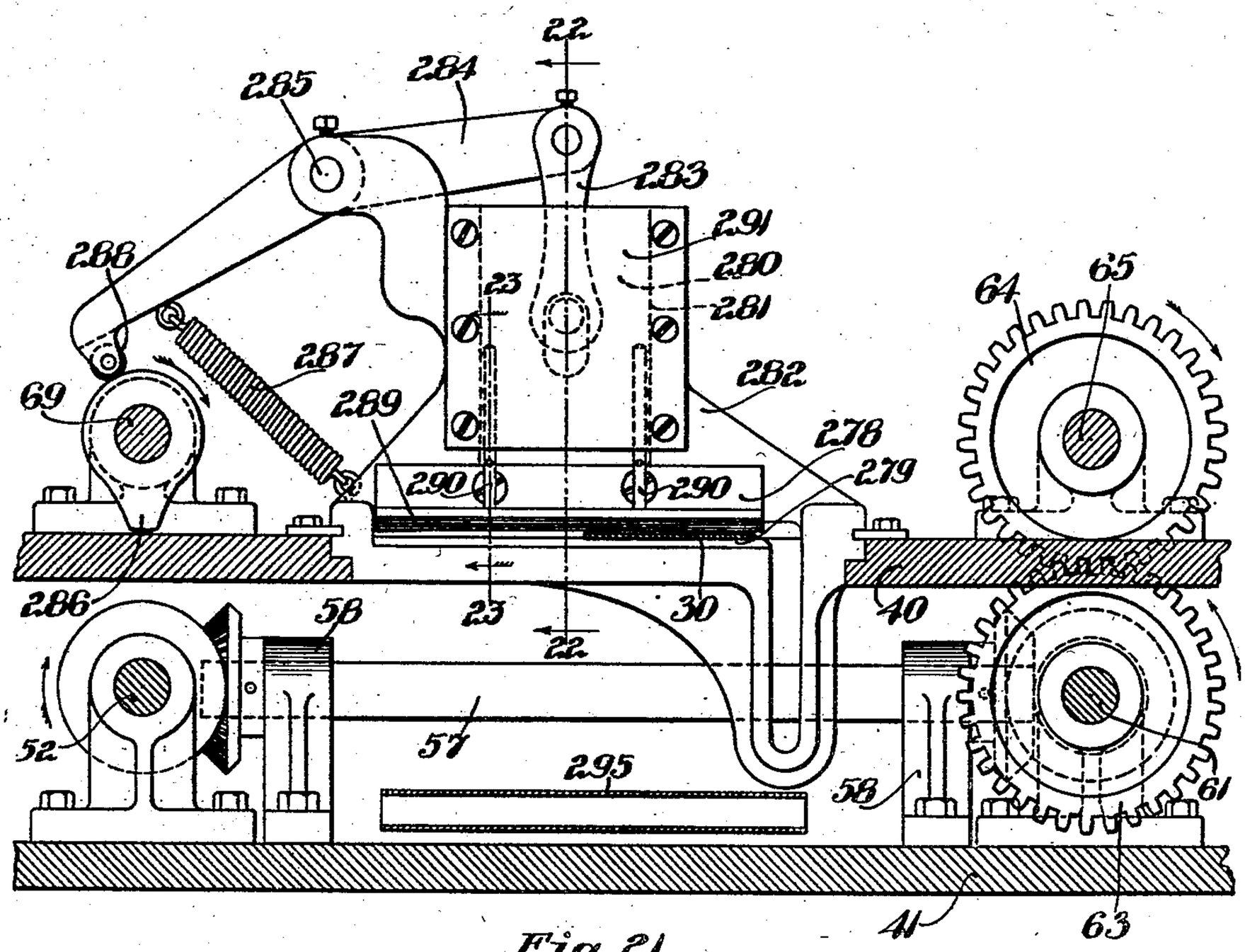

Fig. 21.

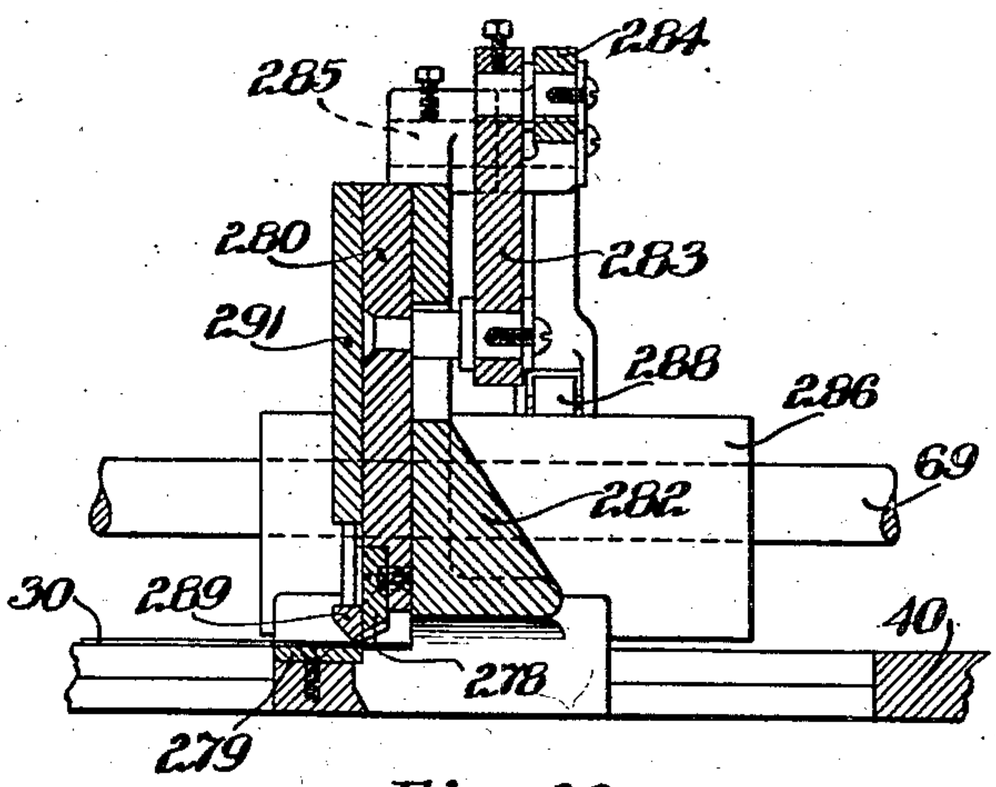

Fig. 22.

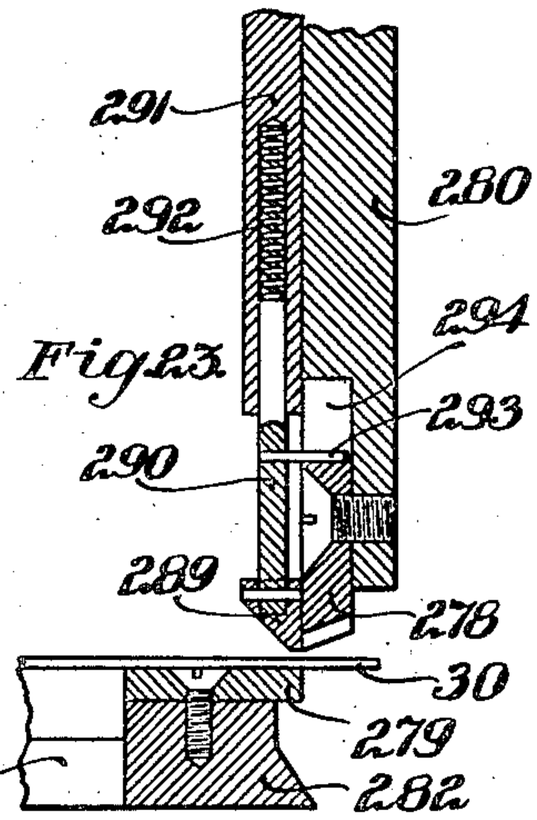

Fig. 23.

Witnesses:
William C. Glass.
Ernest A. Telfer

Inventor:
Arthur Dansereau
by his attorney
Charles S. Goodeve.

No. 894,192. PATENTED JULY 28, 1908.

A. DANSEREAU.

MACHINE FOR MANUFACTURING TAGS.

APPLICATION FILED JULY 14, 1906.

10 SHEETS—SHEET 10.

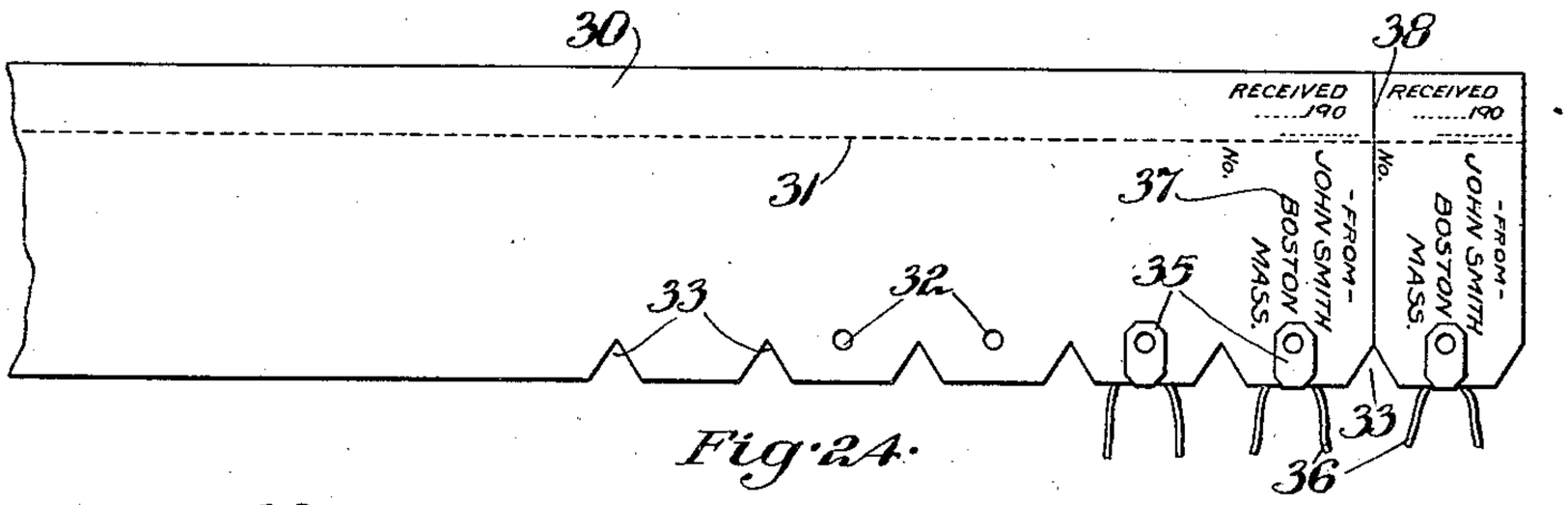

Fig. 24.

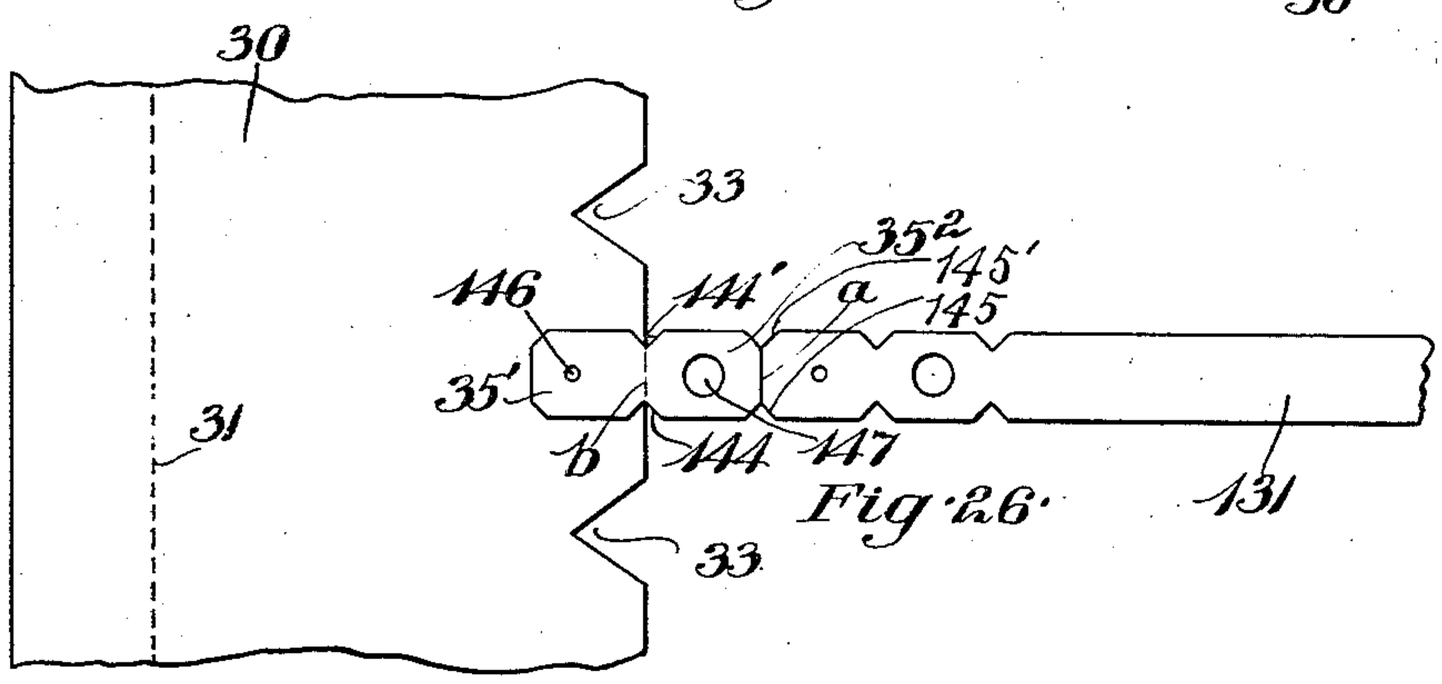

Fig. 26.

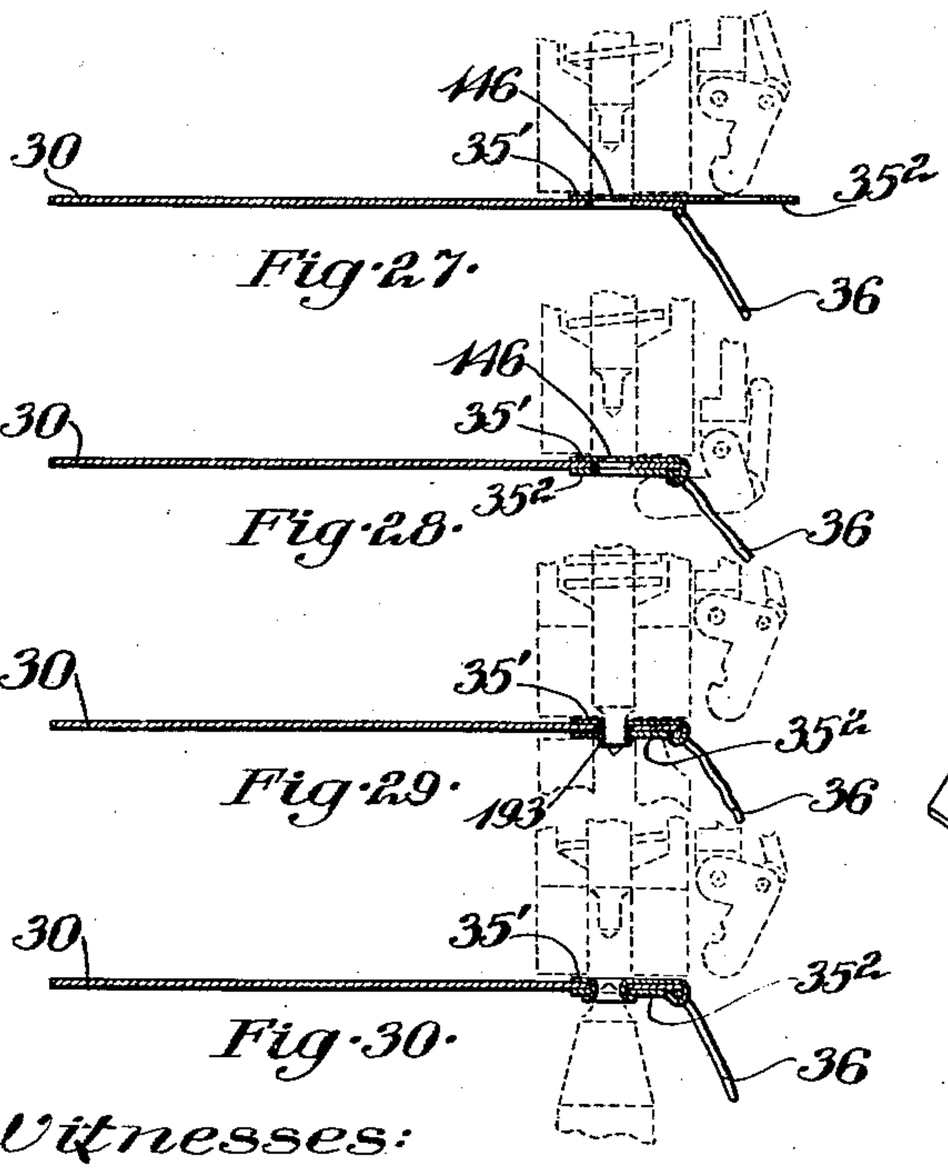

Fig. 27.

Fig. 28.

Fig. 29.

Fig. 30.

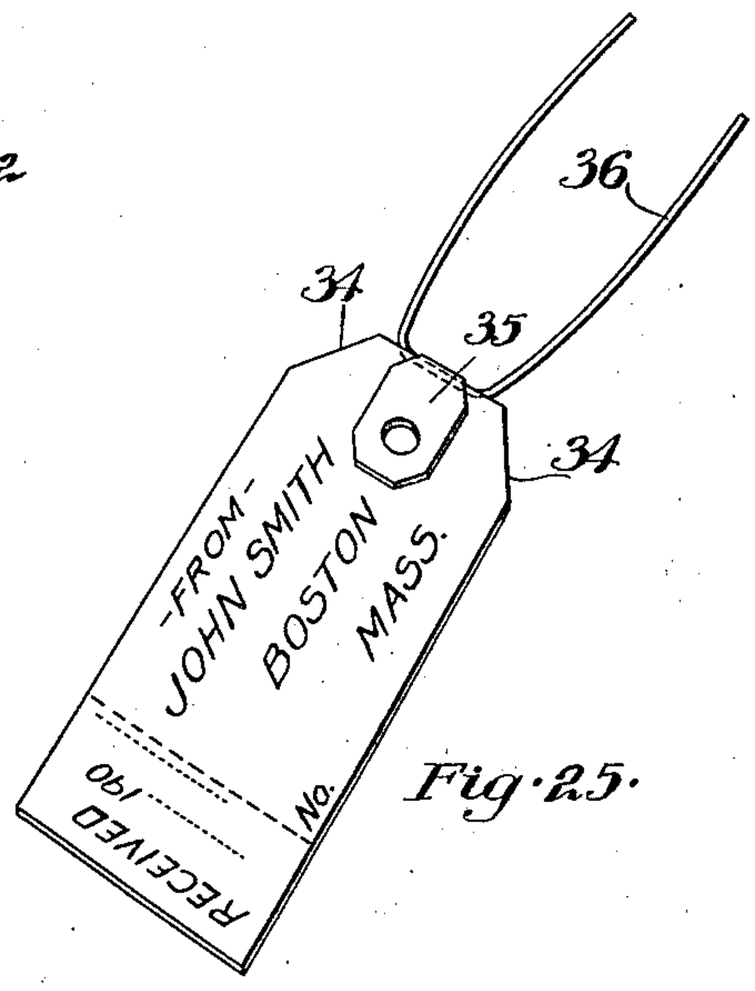

Fig. 25.

Witnesses:

William C. Glass.

Ernest A. Tulfer

Inventor:

Arthur Dansereau

by his attorney, Charles S. Gooding.

UNITED STATES PATENT OFFICE.

ARTHUR DANSEREAU, OF SOUTHBRIDGE, MASSACHUSETTS.

MACHINE FOR MANUFACTURING TAGS.

No. 894,192. Specification of Letters Patent. Patented July 28, 1908.

Application filed July 14, 1906. Serial No. 326,182.

To all whom it may concern:

Be it known that I, ARTHUR DANSEREAU, a citizen of the United States, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Machines for Manufacturing Tags, of which the following is a specification.

This invention relates to a machine for manufacturing tags from a web of heavy paper or cardboard and attaching to the tag a string, wire, or other device by means of which the tag may be tied to any desired article, said string, wire, or the like being attached to the tag by a metal clip bent transversely thereof and securely fastened to the tag with the string or wire clamped to the tag by said clip.

The object of the invention is to provide a machine which will manufacture tags from a continuous web of paper, the corners of said tags being beveled off at one end thereof and at the same end of the tag a metal clip attached to the tag with a string, wire or the like clamped between the clip and the tag, the machine also being adapted to print any desired matter upon the tag before said tag is finally cut from said web of paper, and to perforate the web of paper longitudinally thereof, so that the completed tag will be perforated transversely thereof in order that a portion of the tag may be readily separated from the main body thereof.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings: Figure 1 is a side elevation of my improved machine for manufacturing tags, the same being partly broken away and shown in section. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged plan view of the main driving shafts and gearing, the top of the frame being removed on line 3—3 Fig. 1 and the remainder of the frame being broken away to save space in the drawings. Fig. 4 is a section taken on line 4—4 of Fig. 3, looking toward the right in said figure, illustrating the pawl and ratchet feed mechanism for the paper feed rolls. Fig. 5 is a section, partly in elevation, taken on line 5—5 of Fig. 2, illustrating the mechanism by means of which notches are cut in the edge of the web of paper. Fig. 6 is a section, partly in elevation, taken on line 6—6 of Fig. 5. Fig. 7 is a section taken on line 7—7 of Fig. 5 illustrating the cutters. Fig. 8 is a section, partly in elevation, taken on line 8—8 of Fig. 2, illustrating the mechanism for punching the web of paper. Fig. 9 is a section, partly in elevation taken on line 9—9 of Fig. 8 and broken away. Fig. 10 is a section, partly in elevation, taken on line 10—10, Fig. 2, illustrating the mechanism for cutting and bending the metal clips and attaching the same to the tag. Fig. 11 is a plan view, partly in section, taken on line 11—11 of Fig. 10. Fig. 12 is a detail view, partly in section, showing the metal bending mechanism. Fig. 13 is an enlarged section, partly in elevation, taken on line 13—13 of Fig. 2, illustrating the metal punching, cutting and bending, and attaching mechanism. Fig. 14 is a section, partly in elevation taken on line 14—14 of Fig. 13, looking toward the left in said figure. Fig. 15 is a plan view of the female member of the metal strip die punched plate. Fig. 16 is a plan view of the mechanism for feeding the string or wire, the frame of the machine being broken away as well as the driving shafts to save space. Fig. 16′ is a side elevation of a portion of string holding mechanism. Fig. 17 is an end elevation of the clip bending spring attaching mechanism, the bed-plates of the frame and the shafts being shown in section. Fig. 18 is a section, partly in elevation, taken on line 18—18 of Fig. 2, illustrating the main driving shafts which actuate the paper feed rolls and printing mechanism. Fig. 19 is a section, partly in elevation, taken on line 19—19 of Fig. 18, illustrating the journal bearings for the paper feed rolls. Fig. 20 is a section, partly in elevation, taken on line 20—20 of Fig. 16, illustrating the mechanism for cutting the string. Fig. 21 is a section, partly in elevation, taken on line 21—21 of Fig. 2, illustrating the mechanism for cutting off the completed tags from the web of paper. Fig. 22 is a section, partly in elevation, taken on line 22—22 of Fig. 21, looking toward the left in said figure. Fig. 23 is an enlarged section, partly in elevation, taken on line 23—23 of Fig. 21. Fig. 24 is a plan view of the web of paper, illustrating the same as it appears when being fed through the machine. Fig. 25 illustrates a completed tag as manufactured on the machine of my invention. Figs. 26 to 30 are diagrammatic views illustrating in plan (Fig. 26) and in section, partly in elevation (Figs. 27 to 30) the dif-

ferent steps taken in attaching the metal clip and string to the web of paper.

Like numerals refer to like parts throughout the several views of the drawings.

Before entering into a specific description of the mechanism and its mode of operation, I will describe in general the consecutive operations to which the web of paper is subjected in order to manufacture a complete tag such as that illustrated in Fig. 25.

Reference being had particularly to Fig. 24, the web of paper 30 is perforated longitudinally thereof along the line 31. The web is then notched, as at 33, and holes 32 are next punched therein, said notches forming the beveled corners 34 of the completed tag. The next operation is the attaching of a metal clip 35 to the web of paper midway between the notches 33, said metal clip serving as an attaching means for fastening the string 36 to the tag and being cut from a continuous strip of metal which is first punched with holes of different diameters alternately disposed, first a small and then a large hole, the strip being notched upon its opposite edges midway between said holes and then cut transversely thereof between two of said notches and bent in such a manner as to inclose or clamp the string to one face of said web of paper, and attaching mechanism being employed to rivet the clip securely to the web of paper. After the string has been attached by means of the metal clip 35 to the web of paper, said web of paper is printed with any matter which may be desired, as at 37, and the tag now being completed is cut off along the line 38 extending transversely of the web of paper and in alinement with the bottom of the notch 33.

In the drawings, 39 is the frame of the machine consisting of a top 40 and a base 41, joined together by standards 42, 43 and supported upon legs 44, 45. 46 is the main driving shaft of the machine (Fig. 3) the same being journaled in bearings provided in brackets 47, 47 fast to the base 41. The shaft 46 is rotated by means of suitable pulleys and has a bevel gear 48 fast thereto and meshing into bevel gears 49 and 50 fast to shafts 51 and 52, respectively. The shaft 51 is a cam-shaft extending longitudinally along one side of the machine and journaled in bearings formed in brackets 53 fast to the bed-plate 41. The shaft 52 is journaled in a bearing formed in a stand 54 also fastened to said bed-plate. Said shaft 52 has a bevel gear 55 fast thereto and meshing into a bevel gear 56. The bevel gear 56 is fastened to a shaft 57 extending transversely of the machine and journaled in bearings formed in the brackets 58, 58 fast to the bed-plate 41. The cross-shaft 57 has a bevel gear 59 fast thereto and meshing into a bevel gear 60 fast to another shaft 61 which is journaled in brackets 62 fast to the bed-plate 41. The shaft 61 has a gear 63 fast thereto which meshes into a gear 64 fast to a cam-shaft 65 journaled in bearings formed in brackets 66 fast to the top 40 of the frame, while the shaft 51 has a gear 67 fast thereto and meshing into a gear 68 fast to a cam-shaft 69 journaled in suitable brackets 70 fast to the top 40.

The web of paper is fed into the machine by two feed-rolls 71 and 72 (Figs. 1, 3, 18 and 19). The lower feed-roll 71 is fast to a shaft 73 journaled in bearings in brackets 74 fastened to the top 40. A gear 75 fast to the shaft 73 meshes into another gear 76 fast to a shaft 77, the shaft 77 being fastened to the upper paper feed-roll 72. The upper feed roll is held against the lower feed-roll with a spring pressure by means of springs 78 which bear against a cap-box 79 located in a slot 80 formed in the bracket 74, said cap-box bearing upon its under side against the shaft 77. This spring bearing construction is duplicated at the opposite ends of the roll 72, so that the upper roll is held against the web of paper with a spring pressure and thus adjusts itself to varying thicknesses of paper.

An intermittent rotary motion is imparted to the shaft 73 by the following mechanism: The main driving shaft 46 has a crank-arm 81 fast thereto which is provided with a slot 82. A bolt or crank-pin 83 is fastened to the arm 81 and is adjustable longitudinally thereof in the slot 82, being clamped in said slot by means of a nut 84 and sleeve or thimble 85. A link 86 is pivoted upon the thimble 85 and pin 83 so as to rock loosely thereon and is pivotally connected at the other end thereof, by a pin 87, to a rack 88 adapted to slide in ways 89 formed in a standard 90 fast to the lower bed-plate or base 41. The rack 88 meshes into a gear 91 loosely mounted on the shaft 73. Said gear has pawls 92 (Fig. 4) pivoted to the inner face thereof which are held in engagement by springs 93 with a ratchet 94, said ratchet being rigidly fastened to the shaft 73. It will thus be seen that as the main shaft is rotated in the direction of the arrow (Fig. 1) the arm 81 will be rotated and through the link 86 a reciprocatory motion will be imparted to the rack 88 which will impart a rocking motion to the gear 91, and said gear will impart, through the pawls 92, an intermittent rotary movement in the direction of the arrow (Fig. 4), thus feeding the paper forward step by step at each rotation of the main shaft, the amount of feed of the web of paper being regulated by the distance of the crank-pin 83 from the center of said main driving shaft.

As the paper is fed into the machine, it is first perforated along the line 31 by means of a perforating disk 95 journaled upon a frame 96 and constructed to press downwardly upon the web of paper, said web of paper being supported upon a roll 97 located imme-

diately beneath the perforating disk 95 and fast to a shaft 98 journaled to rotate in bearings formed in brackets 99 fast to the top 40. The frame 96 is adjustable transversely of the web of paper upon a rod 100 which is supported upon the bracket 99′ so that the perforating disk 95 can be adjusted to any desired position transversely of the web of paper, and the row of perforations 31 may thus be brought to any desired location from the edge of the web of paper or from the end of the completed tag.

The mechanism for punching the holes 32 in the web of paper is located immediately following the notching mechanism hereinafter described and at the right thereof (Fig. 1). This punching mechanism is illustrated in Figs. 8 and 9 and consists of a punch 101 adapted to coöperate with a female die-plate 102, both of which are supported upon a head 103 adapted to slide upon the frame top 40 and being clamped thereto by plates 104 and screws 105. The punch 101 is fastened to a slide 106 which is moved upwardly by a spring 107 and downwardly by a lever 108 pivoted to a stationary shaft 109 supported upon brackets 110 and 159 fast to the top 40. The right hand end of the lever 108 bears against the top of the slide 106 and the left hand end thereof (Fig. 8) bears against a cam 111 fast to the shaft 69. The cam 111 is of sufficient length so that the lever 108 may be adjusted longitudinally upon the shaft 109, said lever being held against motion of the shaft 109 by collars 112 fast to said shaft, so that for different widths of tag corresponding to different lengths of feed, hereinbefore described, the punch will be adjusted longitudinally of the web of paper by sliding the head 103 to the desired position and also sliding the lever 108 along the shaft 109 to keep the same in alinement with the slide 106. The paper is guided along the top 40 by a guide-plate 113 and this guide-plate is adjustable upon the top 40 transversely of the web of paper, being rigidly fastened to said top by the screw 114.

The mechanism in advance of the punching mechanism just described and located at the left of said punching mechanism (Fig. 1) is the mechanism for notching the paper on one side thereof in order that when the tags are severed from the web of paper they may have the opposite corners at one end beveled, as at 34. The specific mechanism for accomplishing this notching of the paper is illustrated in Figs. 5, 6 and 7 and consists of a pair of movable cutters 115 fastened to a slide 116, said movable cutters coöpeating with a stationary cutter or die-plate 117. The cutter plate 117 is supported upon a slide-plate 122 and the movable cutters 115, as well as the slide 116, are supported upon a head 118 which is also fast to said slide-plate122. The slide-plate 122 is adapted to move in ways 119 longitudinally of the web of paper, said ways being formed in the table top 40. The slide-plate 122 is rigidly clamped to said table top by clamp-plates 120 and screws 121. The head 118 may be adjusted, together with the cutters, transversely of the web of paper by sliding said head in the slot 123 formed in the slide-plate 122. The head 118 is fastened to the slide-plate 122 by means of a screw 124, which has screw-threaded engagement with said head and projects through a slot 125 in the bottom of said slide-plate 122. A guide-plate 126 fast to the table top 40 is adjustable transversely of the web of paper and is fastened to said table top by a screw 127. The slide 116 is moved upwardly on the head 118 by means of a spring 128, the lower end of which is fastened to said slide, the upper end being fastened to a rod 129 fast to the head 118. A cam-lever 130 moves the slide 116 downwardly, said cam-lever being pivoted upon the rod 109 and bearing at its left hand end (Fig. 5) against the cam 111.

The next operation in the manufacture of the tag is the affixing of the metal clip 35 thereto and the affixing of a string, wire, or the like is accomplished by said clip. I will first proceed to describe the manner in which the metal clip is attached to the web of paper, this operation being illustrated in diagram views in Figs. 26 to 30 inclusive, the mechanism by which the different steps in the operation of cutting off, punching and bending the metal clip is accomplished being illustrated in Figs. 10, 11, 12, 13, 14 and 15. The clips are made from a thin strip of soft metal 131 which is fed transversely of the web of paper by feed-rolls 132 and 133. The feed-roll 133 is fast to a shaft 134 journaled to rotate in bearings in the table 40 (Fig. 13). The upper feed-roll 132 for the metal strip is fast to a shaft 135 journaled to rotate in boxes 136 supported in brackets 137 fast to the table top 40. An intermittent rotary motion is imparted to the roll 132 by a ratchet 138 (Fig. 10) which is fastened to the shaft 135 and is rotated by pawls 139 pivoted to a pawl-holder 140 loosely mounted upon the shaft 135 so as to rock thereon. A rocking movement is imparted to said pawl-holder 140 by a link 141 pivotally attached at one end to said pawl-holder and at the other end thereof to a crank-pin 142 fast to a disk 143 which, in turn, is fastened to the shaft 65. At each feed of the metal strip 131, referring to Fig. 26, notches 144 and 144′ and notches 145 and 145′ are cut from the edges of said strip and simultaneously with this cutting of the notches two holes of different diameters 146 and 147 are punched in said strip, the hole 146 being of smaller diameter than the hole 147. This cutting of the notches 145 and 145′ and the punching of the holes 146 and 147 is performed by a male and female die-plate and punch 148 and 149, respec-

tively. The male punch and die 148 is fastened to a slide 150 guided in ways formed in a bracket 151 fast to the top 40. A reciprocatory motion is imparted to the slide 150 by a lever 152 pivoted at 153′ to a bracket 154 fast to the table top 40. A rocking motion is imparted to the lever 152 by a cam 155, said lever having a cam-roll 156 journaled thereon which is held in contact with the cam 155 by a spring 157. The female punch and die is rigidly fastened to the top of the table 40.

After the strip of metal 131 has been punched and notched as described, it is fed forward transversely of the web of paper 30 to the position illustrated in Fig. 26 with the notches 144 and 144′ in alinement with the notched edge of said paper and midway between the notches 33, 33. The clip 35 is next cut off the end of the strip 131 along the line *a* (Fig. 26) by a movable cutter 203 fastened to the die-block 148 which coöperates with the left hand edge 204 of the female die-block 149 (Figs. 13 and 15), said clip consisting of two parts 35′ and 35², the portion 35′ being held against the upper face of the web of paper, while the portion 35² is bent on the line *b* (Fig. 26) around beneath the web of paper. The two parts forming the clip are then joined together by riveting, all as in the manner which I will now proceed to describe.

The part 35′ is held against the upper face of the paper by a presser 158 which is adapted to slide in a head 159 fast to the table top 40. The presser 158 is moved downwardly by a lever 160 and is moved upwardly by springs 161′, the lower ends of which are fastened to the presser 158, the upper ends to a yoke 162 fast to the head 159. The lever 160 is pivoted on the shaft 109 and is rocked upon said shaft by a cam 163 fast to the shaft 69. A cam-roll 164 is journaled upon the lever 160 and is held thereagainst by the springs 161′. During the bending and riveting of the clip to the paper, the presser 158 is held against the upper surface of the clip.

The part 35² of the clip is bent around the notched edge of the paper from the position shown in Fig. 27 to that shown in Fig. 28 by a bender 165 consisting of a lever pivoted at 166 to a slide 167 adapted to slide in ways in the head 159. A spiral spring 169 is contained within a slot 170 formed in the slide 167, one end of said spring being fastened to a pin 171 fast to a slide 168, the other end of said spring bearing against the bottom of the slot 170 formed in said slide 167, the action of the spring being to normally hold the slides 167 and 168 in the relative positions illustrated in Fig. 13. The slide 168 is of the same width as the slide 167 and both are adapted to slide in ways in the head 159.

The bender 165 is connected to the slide 168 by a link 172. A vertical reciprocatory motion is imparted to the slide 168 by a lever 173 pivoted on the rod 153 fast to the bracket 154. The rocking motion is imparted to the lever 173 by the cam 174 fast to the shaft 65, said lever 173 being provided with a cam-roll 175 arranged to bear against the periphery of the cam 174. A pin 176 fast to the lever 173 projects into a slot 177 formed in a bracket 178 fast to the slide 168 and thus connects the lever 173 to the slide 168, so that a rocking motion of said lever 173 imparts a reciprocatory motion to the slide 168.

In folding the part 35² around the paper from the position illustrated in Fig. 27 to that illustrated in Fig. 28, the first part of said folding or bending is performed by the slides 168 and 167 descending together until the downward motion of the slide 167 is arrested by a stop 179 fast to the head 159 and projecting into a slot 180 formed in the side of the slide 167. When said slide 167 has traveled until the upper end of the slot 180 abuts against the stop 179, the bender 165 will have bent the part 35² at right angles with the part 35′. A further downward motion of the slide 168 then takes place, while the slide 167 remains stationary, and the bender is rocked upon its pivot 166 to the position illustrated in dotted lines (Fig. 28), thus bringing the part 35² up against the under surface of the web of paper 30. The part 35² in this latter part of its folding motion passes between the outer ends of two horizontal levers 181 and 182 pivoted upon studs 183, 183 fast to the table top 40. These levers are each provided with a cam-roll 184, said cam-rolls bearing against the cam faces 185 formed upon the cam 186 which is fastened to the shaft 51, said levers being drawn toward each other so that the cam-rolls 184 will be held in contact with said cam faces 185 by a spiral spring 187. As soon as the part 35², therefore, has been bent as shown in Fig. 28, the cams 185 operate to overcome the tension of the spring 187 and to bring the anvil plates 188, 188 fast to the outer ends of the levers 181, 182 toward each other beneath the part 35², thus holding said part 35² in the position illustrated in Fig. 28 when the bender 165 is moved by the slides 167 and 168 back to the position illustrated in Fig. 13. As soon as the bender 165 has moved out from between the plates 188, 188, these plates are brought together, forming an anvil plate as a whole, with a cylindrical hole therein formed by the two holes 189 and 190 formed in the adjacent ends of the plates 188, 188 (see Figs. 11 and 13). The clip is now in position to have the two parts 35′ and 35² riveted together and to the web of paper 30, and this is accomplished by a downward motion of a pin 191 which enters the small hole 146 in the part 35′ and forces that portion of the metal immediately surrounding said part 35′ downwardly and through the hole 32 in the paper and through the hole 147 in the part 35² as illustrated in Fig. 29. The pin 191 then moves upwardly,

as hereinafter described, and the anvil 192 is moved upwardly, clenching the shank 193 to the part 35^2, as illustrated in Fig. 30. During this latter motion the anvil plates 188, 188 are moved apart sufficiently to allow the anvil to be introduced therebetween in order to perform a clenching operation.

The vertical movement of the pin 191, hereinbefore referred to, is obtained in the following manner. Said pin is fastened to a slide 194 adapted to slide in a recess 195 formed in the presser 158. In the same recess is located a spiral spring 196, the upper end of which bears against said slide 194, the lower end against the bottom of said recess 195. The upper end of the slide 194 engages a lever 197 pivoted upon the rod 161, a rocking motion being imparted to said lever by a cam 198 fast to the shaft 69. A vertical reciprocatory motion is also imparted to the anvil 192 which slides in a bracket 199 fast to the bottom of the table top 40 by a lever 200 pivoted at 201 to a bracket 202 fast to the under side of the table top 40, a rocking motion being imparted to said lever 200 by the cam 186 fast to the shaft 51.

When the part 35^2 is folded under the paper and attached thereto by riveting, as hereinbefore described, the string or cord 36 is first laid underneath the edge of the paper, so that it is fastened to the paper by the attaching of the clip thereto. The string 36 is fed into position and cut off by the following mechanism, illustrated in Figs. 16, 17 and 20. Said string 36 is led from a suitably supported ball of the same, 205, (Fig. 1) to a carrier 206 consisting of a rod 207 having a clutch finger 208 pivoted thereto and extending into a groove 209 formed in said rod in which the string 36 is located, said clutch finger acting to clamp the string to the rod 207 when said rod is moved forwardly or in the direction of the arrow (Fig. 16), but which allows said string to slip therebeneath when the rod is retracted or moved in the opposite direction from the arrow, (Fig. 16). The rod 207 is adapted to slide in a bearing 210 formed upon a bracket 211 fast to the base 41. The rod 207 has a reciprocatory motion imparted thereto by a lever 212 pivoted at 213 to a bracket 214 fast to the base 41, a rocking motion being imparted to said lever by a cam 215 fast to the shaft 51.

The carrier 206 moves forward in the direction of the arrow (Fig. 16) with the free end of the string projecting slightly beyond the front end thereof and inserts said free end in a clamp 216. The clamp 216 consists of a stationary clamp-plate 217 fast to a bracket 218 supported upon the base 41, and of a movable clamp-plate 219 fast to a slide 220 adapted to slide longitudinally thereof in the bracket 218, said movable clamp-plate 219 being held normally toward the stationary clamp-plate 217 by a spiral spring 221 which encircles the slide 220 and acts to force it toward the right (Fig. 17). The clamp-plate 219 is moved toward the left to allow the free end of the spring to be inserted between it and the clamp-plate 217 by a cam 222 fast to the shaft 61. The cam 222 is so timed that when the string carrier 206 has brought the free end of the string forward and placed it between the clamp-plates 217 and 219, said cam releases the slide 220 and the spring 221 moves said slide toward the right (Fig. 17) and clamps the free end of the string between the movable clamp-plate 219 and the stationary clamp-plate 217. The rod 207 then moves in a direction opposite to the arrow (Fig. 16) and the string sliding through the carrier 206 is held in a straight line between the carrier 206 and the clamp 216. This string is next pushed upwardly between said carrier and clamp and laid against the under side of the web of paper 30 adjacent to the notched edge thereof, as illustrated in dotted lines in Fig. 17. Said string is pushed upwardly as described by two fingers 223, 223 fast to a lever 224 (Fig. 17) fast to a rock-shaft 225 which is journaled to rock in a bracket 226 fast to the base 41. The shaft 225 has a gear 227 fast thereto and meshing into a rack 228 adapted to slide in the bracket 226 and also guided to slide in a bracket 229 fast to the base 41. The rack-slide 228 has a reciprocatory motion imparted thereto by a cam 230 fast to the shaft 51, so that as said cam rotates the rack-slide 228 is reciprocated, thus rocking the lever 224 and carrying the string upwardly to the position illustrated in dotted lines (Fig. 17) immediately beneath the web of paper in position to be clamped thereto by the clip when said clip is bent and riveted to the paper, as hereinbefore described. A cam-roll 231 bears against the periphery of the cam 230 and is held thereagainst by a spring 232, one end of which is fastened to the rack-bar 228 the other to the bracket 229. The string 36 is now held in the position illustrated in diagram view, Fig. 30, one end being held between the clamp-plates 219 and 217 the other by the carrier 206.

The next operation of the machine is to sever the string at about one-eighth of an inch from the end of the carrier 206 and this cutting operation is performed by mechanism which I will now proceed to describe and which is illustrated in Fig. 16 and particularly in Fig. 20, said Fig. 20 being viewed from the opposite direction to that in which the paper is being fed. A slide 233 guided in ways 234 supported upon the standard 90 has a slot 235 formed therein and said slide is moved forward or toward the right (Fig. 20) or toward the left (Fig. 16) until the string 36 passes into the slot 235. This motion of the slide 233 is obtained by means of a link 236 which connects the slide 233 to

a lever 237 pivoted at 238 to a bracket 239 fast to the table 40. A rocking motion is imparted to the lever 237 by the cam 240 fast to the shaft 61. A spring 241 holds the cam-roll 242 in engagement with the cam 240.

After the string has entered the slot 235 a knife blade 243 pivoted at 244 to the slide 233 engages a pin 245 fast to one of the ways 234, and further forward movement of the slide 233 causes the knife blade 243 to be rocked upon its pivot 244 and passing downwardly by the slot 235 to sever the string 36 at a distance of about one-eighth of an inch in advance of the carrier 206. A spring 246 holds the pivoted knife blade 243 normally in the position illustrated in Fig. 20. The string 36′ is now attached to the tag and hangs downwardly upon opposite sides of the clip 35 and is held firmly against said tag by said clip.

A slot 247 extends longitudinally of the machine in the table top 40 to allow the depending strings 36′ from the web of paper to be fed longitudinally thereof, and in order to prevent these strings 36′, which have been attached to the web of paper, from becoming entangled with the new piece of string which is fed and attached to the web of paper, as hereinbefore described, for each succeeding tag, I provide corrugated plates 248, (Fig. 13) upon opposite sides of the slot 247 and push the two depending ends of the string 36′ between these corrugated plates by means of a slide plate 249 (Figs. 13 and 16). Said plate is fastened to the end of a slide 250 guided in ways 251 fast to the bottom of the table top 40. Said slide has a reciprocatory motion imparted thereto by a lever 252 pivoted at 253 to the table top 40 (Figs. 10 and 16). The lever 252 is connected to the slide 250 by a link 254 and has a rocking motion imparted thereto by a cam 255 fast to the shaft 61, a spring 256 holding a cam-roll 257 journaled upon said lever 252 in engagement with said cam.

Having now attached the string to the web of paper by means of the clip, the next operation is to print upon the surface of the web of paper, and this is accomplished by means of any suitable printing mechanism, the particular form of printing mechanism illustrated in Fig. 1 being preferably used by me, the same consisting of a rocking head 258 (Fig. 1) pivoted at 259 to a bracket 260 fast to the table top 40 and counterbalanced by means of a weight 261. The printing mechanism is driven from the main shaft 46 by means of a gear 262 fast thereto and meshing into a gear 263 fast to a shaft 264 journaled in brackets 265 and 266 (Fig. 3). The shaft 264 has crank-pin disks 267, 267 fast thereto, each provided with a crank-pin 268 which is connected by a link 269 to the rocking head 258 by means of pivotal studs 270. The form 271 is fastened to the rocking head 258 and is inked by means of distributing rolls 272 carried by a rocker arm 273 which is rocked upon the pivot 270 by the combined motion of the rocking head 258 and links 274, connected from said arms 273 to brackets 275 fast to the table top 40, ink being distributed by means of a disk rotated by a pawl and ratchet mechanism operated by a lever 276 pivoted at 277 to the head 258.

After being printed upon the web of paper is fed forward and cut off along the line 38 by a movable cutter 278 which coöperates with a stationary cutter 279 fast to the bracket 282 (Figs. 21, 22 and 23). A reciprocatory motion is imparted to the cutter 278 by a slide 280 guided in ways 281 formed in a bracket 282 supported upon the table top 40. The slide 280 is connected by a link 283 to a lever 284 pivoted at 285 to the bracket 282, a rocking motion being imparted to said lever 284 by a cam 286 fast to the shaft 69, a spring 287 acting to hold a cam-roll 288 journaled upon the lever 284 against the periphery of the cam 286. The web of paper 30 is held against the upper face of the stationary cutter 279, preparatory to being cut transversely thereof by a presser 289 which has two pins 290, 290 fast thereto and projecting upwardly therefrom into recesses formed in the cap plate 291 which is fastened to the bracket 282. Said presser is forced downwardly by springs 292 contained in recesses in the cap-plate 291 and above the guide-pins 290. Stop-pins 293 extending transversely of the pins 290 and fast thereto project into slots 294 formed in the slide 280 above the cutter 278.

The operation of the cutters and presser for severing the tags from the web of paper is as follows: The slide 280 is moved downwardly, together with the presser 289, until said presser comes in contact with the upper face of the web of paper, thus holding said web of paper firmly pressed against the upper face of the stationary cutter 279, the slide 280 continuing its downward movement after the presser has been released therefrom by coming in contact with said web of paper, thus holding said presser 289 firmly pressed against the upper face of the web of paper, while the movable cutter 278 continues its movement with said slide and severs the tag from the web of paper along the line 38. The tag, after being separated from the web of paper, falls upon an endless belt 295 (Figs. 1 and 3) by which it is fed to a suitable receptacle.

The feed of the belt 295 is accomplished by means of a pulley 296 connected by a belt 297 to a pulley 298 fast to a shaft 299 journaled to rotate in the brackets 47, 47, said belt extending over a roll 300 fast to a shaft 301 journaled to rotate in brackets 302 fast to the frame of the machine (Fig. 1).

The general operation of the machine is as

follows: The web of paper 30 is fed longitudinally thereof into the machine by means of feed rolls 71 and 72 actuated from the main driving shaft 46 by the link 86, rack 88, gear 91 and ratchet 94, said feed-rolls being geared together by gears 75 and 76. The paper is first perforated longitudinally thereof by being drawn between the perforating disk 95 and roll 97. It is punched by means of the punch 101 which is reciprocated by the cam 111, lever 108 and spring 107. The paper is notched along one edge thereof at 33, 33 by the cutters 115 and 117, the movable cutter 115 being operated by the slide 116, lever 130 and cam 111. The string 36 is next fed and held against the web of paper upon its under side adjacent to the notched edge thereof by the carrier 206 and fingers 223, said carrier carrying the string to the clamp 216 and having a reciprocatory motion imparted thereto by the slide-rod 207, lever 212 and cam 215. The string is carried up to the web of paper upon its under side adjacent to the notched edge by the fingers 223, which are operated by the lever 224, segment gear 227, rack 228 and cam 230. The string while being held against the under face of the web of paper is clamped thereto by the metal clip 35 which is fed transversely of the web of paper by the feed-rolls 132 and 133 and is notched, punched and cut by the notching cutters, punches and knives carried by the male die plate 148 which cooperates with the female die-plate 149, said male die-plate being operated by the slide 150 to which a reciprocatory motion is imparted by the lever 152 and cam 155. Said clip is held against the upper surface of the paper by the presser 158 and is cut from the strip of metal 131 by the cutter 203. The clip is then bent by the bender 165, as hereinbefore described, around the edge of the web of paper and around the string 36 held thereagainst, as hereinbefore described. Said metal clip is then riveted to the paper, the two parts $35'$ and 35^2 being riveted together by means of the pin 191 and the anvil 192, said parts being given the necessary movements to accomplish said riveting, as hereinbefore described. The string 36 is then cut slightly in advance of the end of the carrier 206 by the knife blade 243 coöperating with the slide 233, said string having first been engaged within the slot 235 provided in said slide 233 by the lateral movement of the said slide operated by the lever 237 and cam 240. As soon as the string has been cut, the opposite end from that which has been cut is released by the clamp 216 and the paper is fed forward with the free ends $35'$, $36'$ of the string attached thereto by means of the metal clip. These free ends are moved forward and held out of the way of the succeeding tag and its depending string by the slide-plate 249 and the corrugated plates 248, respectively. The printing is then done upon the upper surface of the tag by the form 271 which is properly supplied with the printing mechanism hereinbefore described, and the tag is finally cut off of the web of paper by the cutter 278 coöperating with the stationary cutter 279 and drops upon the belt 295 which conveys it to a suitable receptacle.

Having thus described my invention, what I claim and desire by Letters Patent to secure is:

1. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to cut a clip from said strip of sheet metal, mechanism to hold one end of said clamp against one face of said paper and subsequently bend said clip transversely thereof, with its other end against the opposite face of said paper, and means to attach said ends to said web of paper.

2. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to punch holes in said strip of metal, mechanism to cut a clip from said strip of sheet metal mechanism to hold one end of said clamp against one face of said paper and subsequently bend said clip transversely thereof between two of said holes with its other end against the opposite face of said paper, and means to attach said ends to said web of paper.

3. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to punch holes in said strip of metal, mechanism to cut notches in said strip of metal, said notches in pairs arranged one opposite the other upon opposite sides of said strip of metal, mechanism to cut a clip from said strip of sheet metal, the line of cut joining two of said notches and extending transversely across said strip of metal, mechanism to bend said clip transversely thereof and attach it to said web of paper.

4. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to punch holes in said strip of metal of two different diameters alternately disposed, mechanism to cut a clip from said strip of sheet metal, and mechanism to bend said clip transversely thereof between two of said holes and attach it to said web of paper.

5. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to punch holes in said strip of metal of two different diameters alternately disposed, mech-

anism to cut a clip from said strip of sheet metal, mechanism to bend said clip transversely thereof between two of said holes, whereby two of said holes of different diameters are brought into alinement with each other upon opposite sides of said paper, and mechanism to drive the metal immediately adjacent to said smaller hole through said paper and larger hole and clench the metal so driven upon the outer face of said clip.

6. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to cut a clip from said strip of sheet metal, mechanism to hold one end of said clip against one face of said paper and subsequently bend said clip transversely thereof with its other end against the opposite face of said paper, means to hold said clip in its bent position, and means to fasten said ends to said web of paper.

7. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to cut a clip from said strip of sheet metal, mechanism to bend said clip transversely thereof and attach it to said web of paper, and means adapted to hold a cord, wire or the like in position to be attached to said paper by said clip.

8. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to cut a clip from said strip of sheet metal, mechanism to bend said clip transversely thereof and attach it to said web of paper, means adapted to hold a cord, wire or the like in position to be attached to said paper by said clip, and means to cut said strip at one side of said clip.

9. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to cut a clip from said strip of sheet metal, mechanism to bend said clip transversely thereof, means to attach said free ends to said web of paper, mechanism to feed cord, wire or the like transversely of said metal strip, and mechanism to hold said cord, wire or the like in position to be attached to said paper by said clip.

10. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to cut a clip from said strip of sheet metal, mechanism to bend said clip transversely thereof, mechanism to attach said free ends to said web of paper, mechanism to feed cord, wire or the like transversely of said metal strip, and mechanism to hold said cord, wire or the like against said paper adjacent to one edge in position to be attached to said paper by said clip.

11. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to punch holes in said web of paper, mechanism to feed a strip of metal transversely of said web of paper, mechanism to punch holes in said strip of metal, and mechanism to cut a clip from said strip of sheet metal, and bend said clip transversely thereof between two of the holes therein whereby said two holes are brought into alinement with one of the holes in said web of paper.

12. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to punch holes in said web of paper, mechanism to feed a strip of metal transversely of said web of paper, mechanism to punch holes in said strip of metal, mechanism to cut a clip from said strip of sheet metal, mechanism to bend said clip transversely thereof between two of the holes therein whereby said two holes are brought into alinement with one of the holes in said web of paper, and mechanism to attach said metal to said paper.

13. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to punch holes in said web of paper, mechanism to feed a strip of metal transversely of said web of paper, mechanism to punch holes in said strip of metal of two different diameters alternately disposed, mechanism to cut a clip from said strip of sheet metal, and mechanism to bend said clip transversely thereof between said holes of different diameters, whereby said holes of different diameters are brought into alinement with each other and with one of the holes punched in said web of paper upon opposite sides of said paper, mechanism to force the metal immediately adjacent to the smaller of said two holes in said metal through the hole in said paper and through said larger hole and clench the metal so driven upon the outer face of said clip.

14. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to punch holes in said web of paper, mechanism to feed a strip of metal transversely of said web of paper, mechanism to punch holes in said strip of metal, mechanism to cut a clip from said strip of metal, mechanism to bend said clip transversely thereof between two of the holes therein whereby said two holes are brought into alinement with one of the holes in said web of paper, mechanism to feed cord, wire or the like transversely of said metal strip, and means adapted to hold said cord, wire or the like in position to be attached to said paper by said clip.

15. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to punch holes in said web of paper,

mechanism to feed a strip of metal transversely of said web of paper, mechanism to punch holes in said strip of metal, mechanism to cut a clip from said strip of metal, mechanism to bend said clip transversely thereof between two of the holes therein whereby said two holes are brought into alinement with one of the holes in said web of paper, mechanism to feed cord, wire or the like transversely of said metal strip, means adapted to hold said cord, wire or the like in position to be attached to said paper by said clip, and mechanism adapted to print upon one face of said web of paper.

16. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to punch holes in said web of paper, mechanism to feed a strip of metal transversely of said web of paper, mechanism to punch holes in said strip of metal, mechanism to cut a clip from said strip of metal, mechanism to bend said clip transversely thereof between two of the holes therein whereby said two holes are brought into alinement with one of the holes in said web of paper, mechanism to feed cord, wire or the like transversely of said metal strip, means adapted to hold said cord, wire or the like in position to be attached to said paper by said clip, mechanism adapted to print upon one face of said web of paper, and mechanism adapted to sever said web of paper between said clips.

17. In a machine for manufacturing tags, mechanism to feed a web of paper, mechanism to cut notches in one edge of said paper, mechanism to punch holes in said paper midway between said notches, mechanism to feed a strip of sheet metal transversely of said web of paper, mechanism to punch holes in said strip of metal, mechanism to cut a clip from said strip of sheet metal, mechanism to bend said clip transversely thereof, mechanism to attach the free ends of said clip to said web of paper, mechanism to feed and hold a piece of cord, wire or the like in position to be attached to said web of paper by said bent clip, mechanism to print upon one surface of said web of paper, and mechanism to cut said web of paper transversely thereof between two adjacent clips.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ARTHUR DANSEREAU.

Witnesses:

CHANNING M. WELLS,

PITT H. HUBERT.