F. J. ROWSE.

COIN CONTROLLED TICKET VENDING MACHINE.

APPLICATION FILED JAN. 20, 1909.

995,988.

Patented June 20, 1911.

3 SHEETS—SHEET 1.

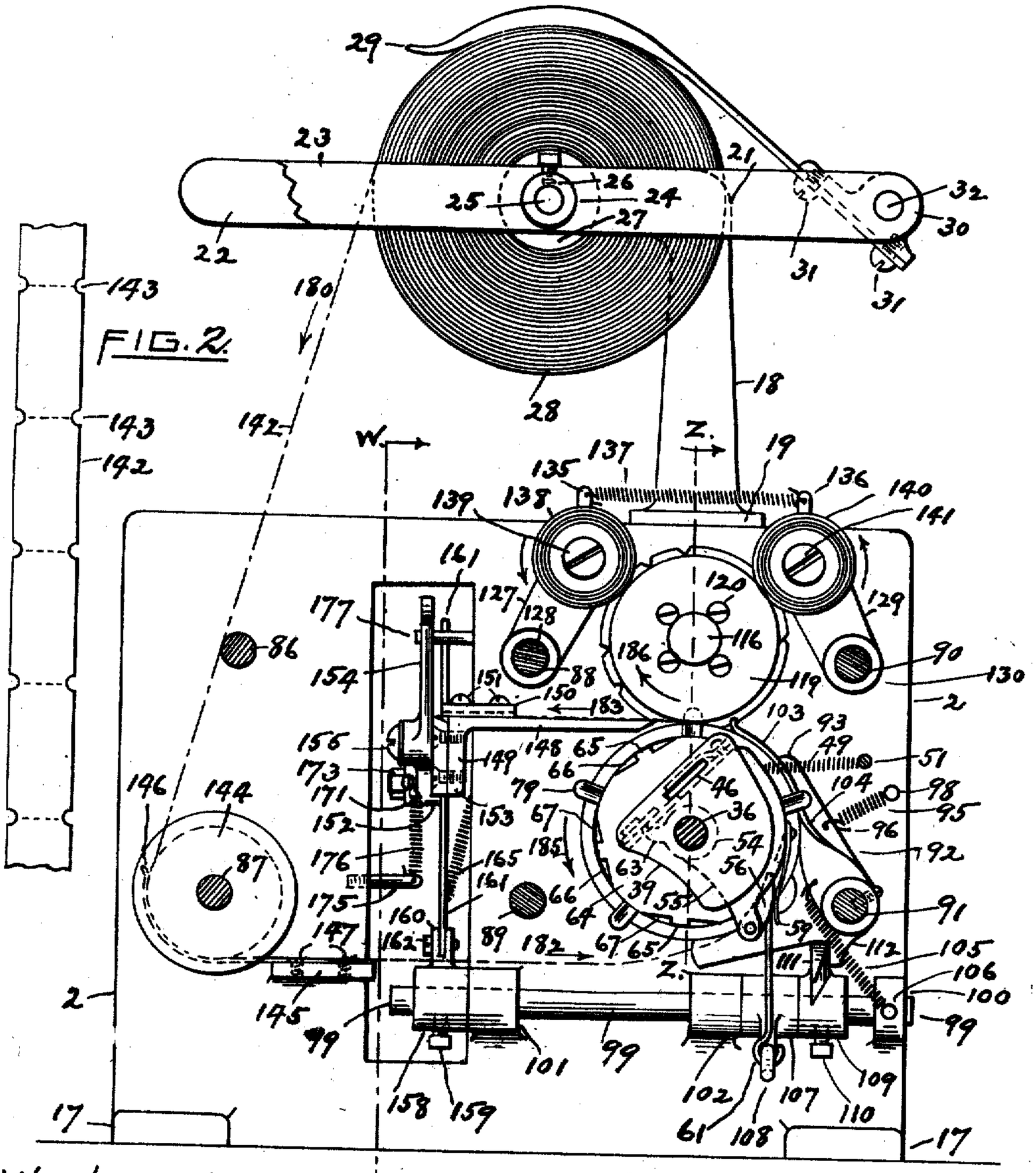

FIG. 2.

FIG. 1.

W.

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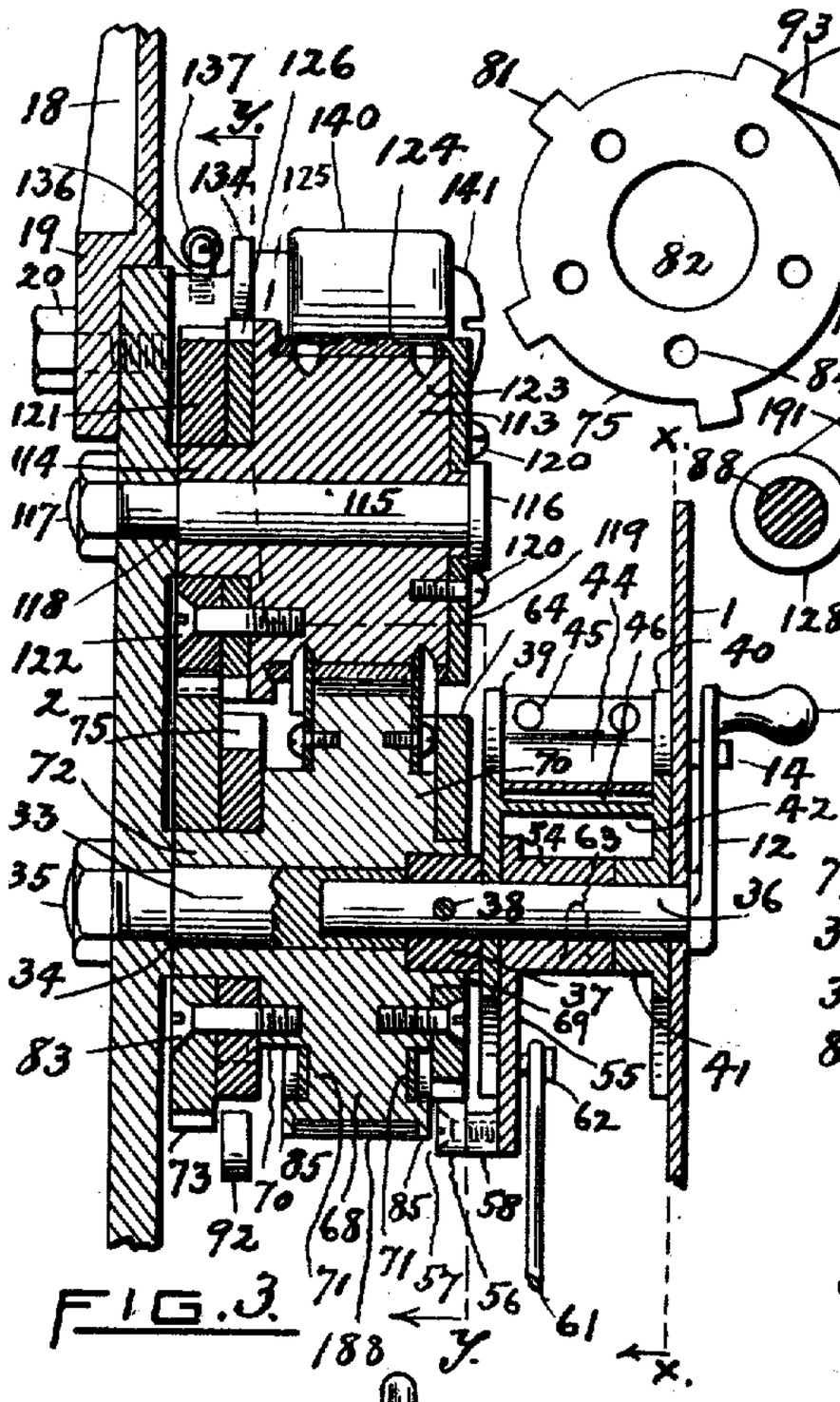

FIG. 3.

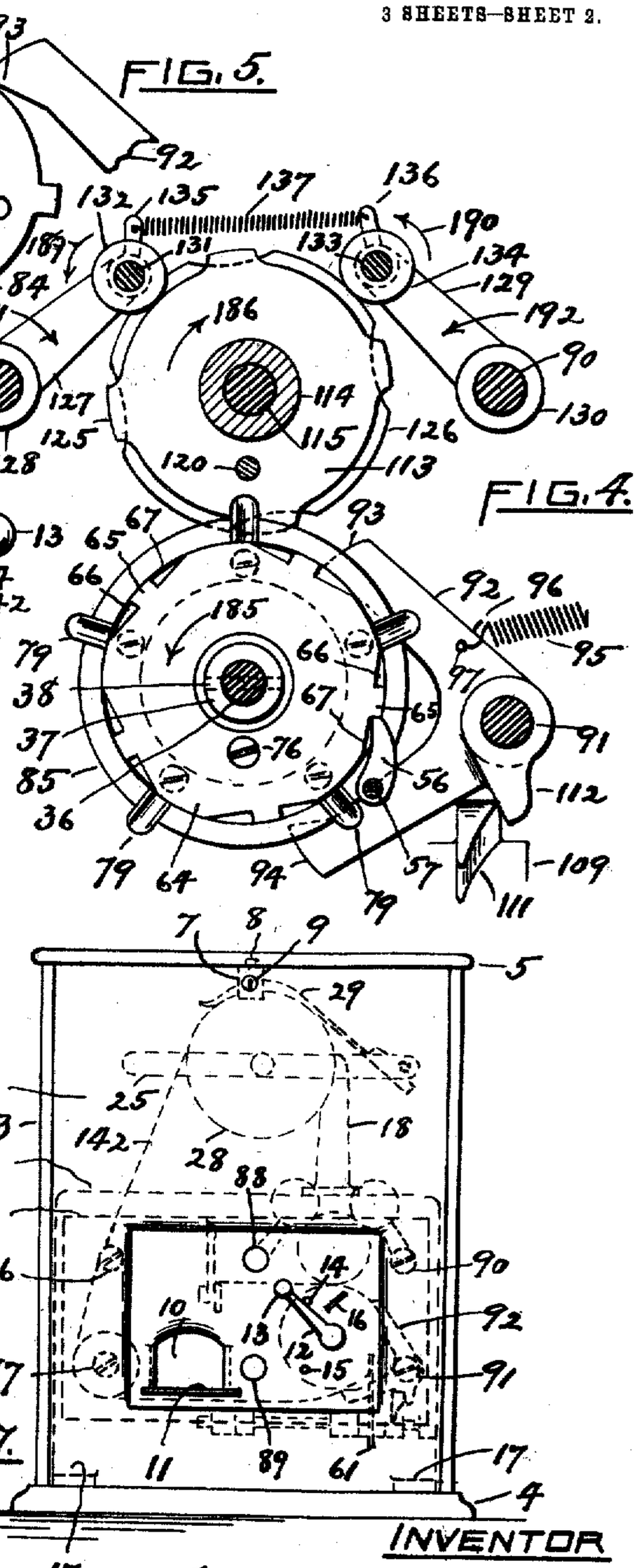

FIG. 4.

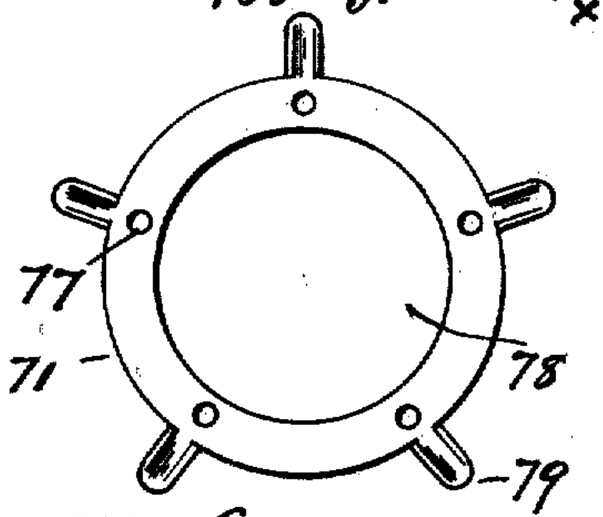

FIG. 6.

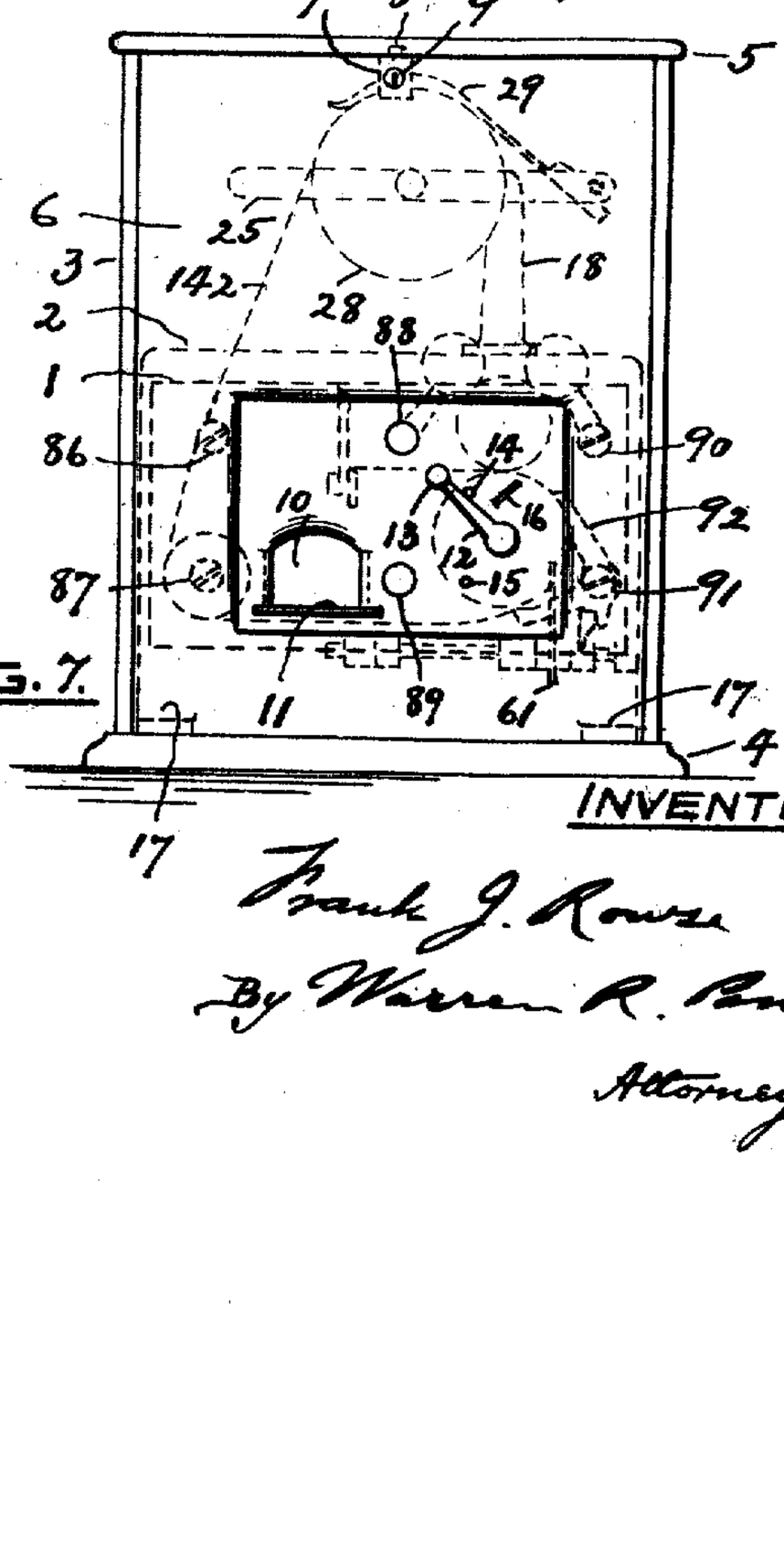

FIG. 7.

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3 SHEETS—SHEET 3.

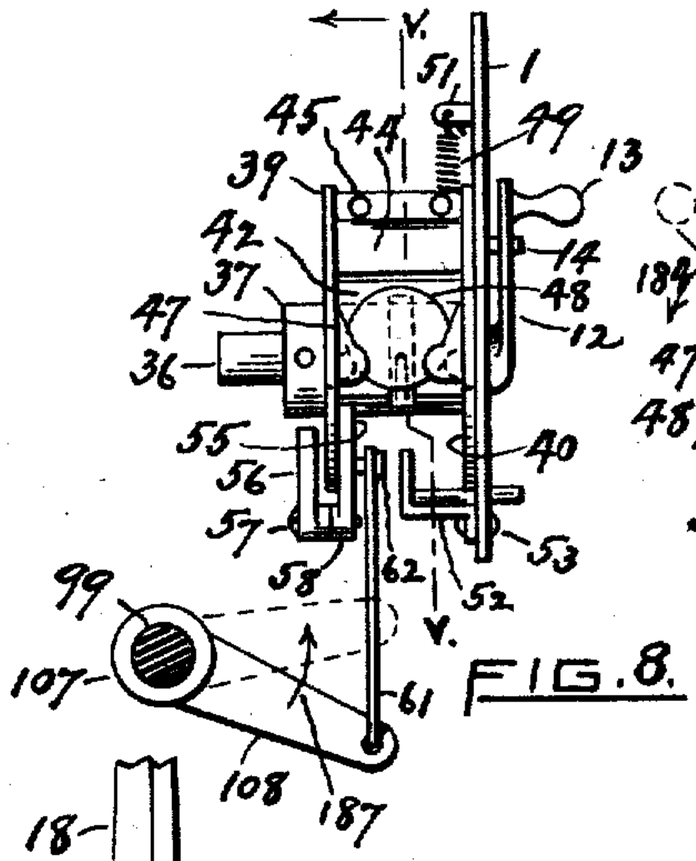

FIG. 8.

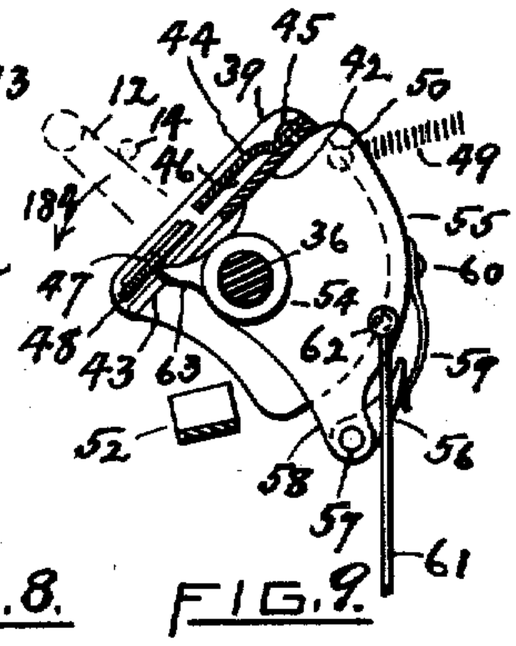

FIG. 9.

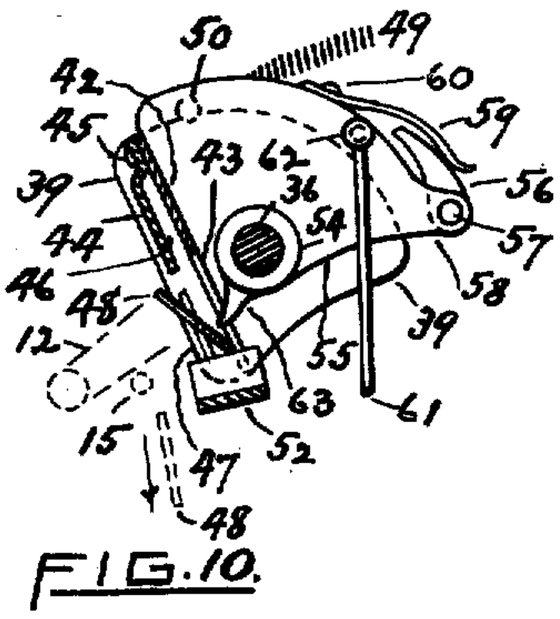

FIG. 10.

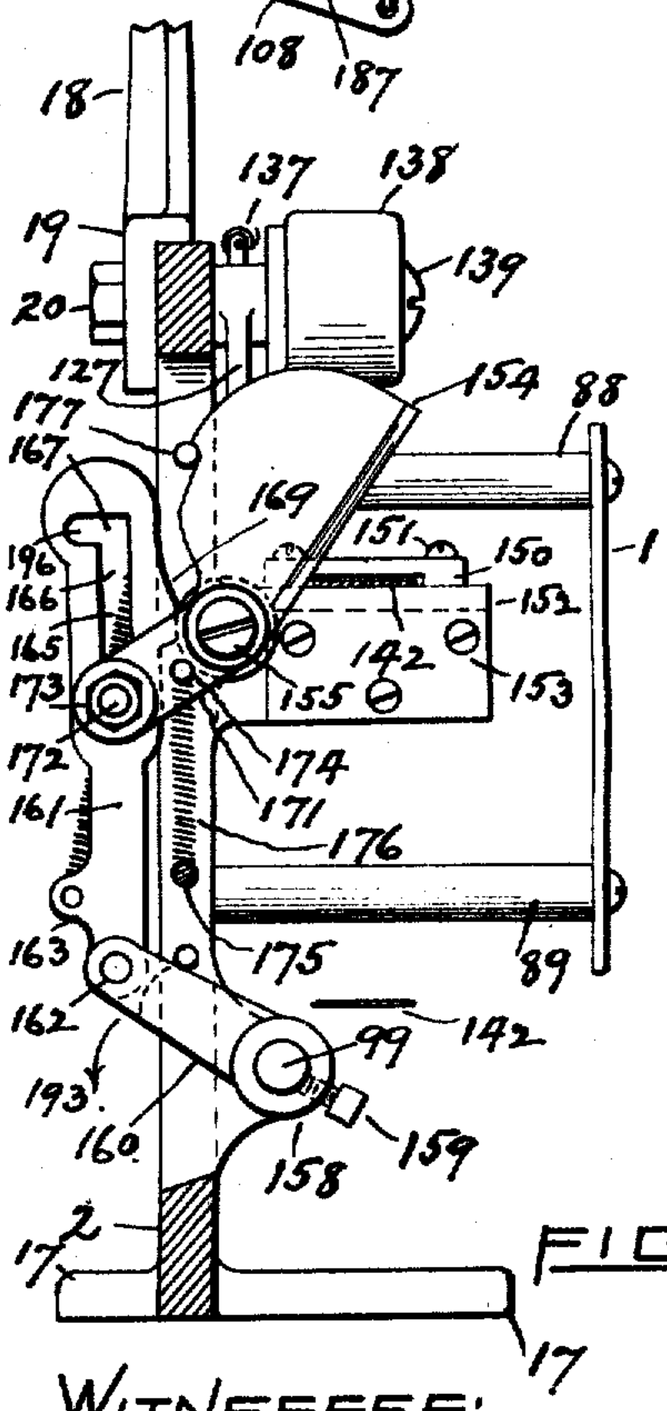

FIG. 11.

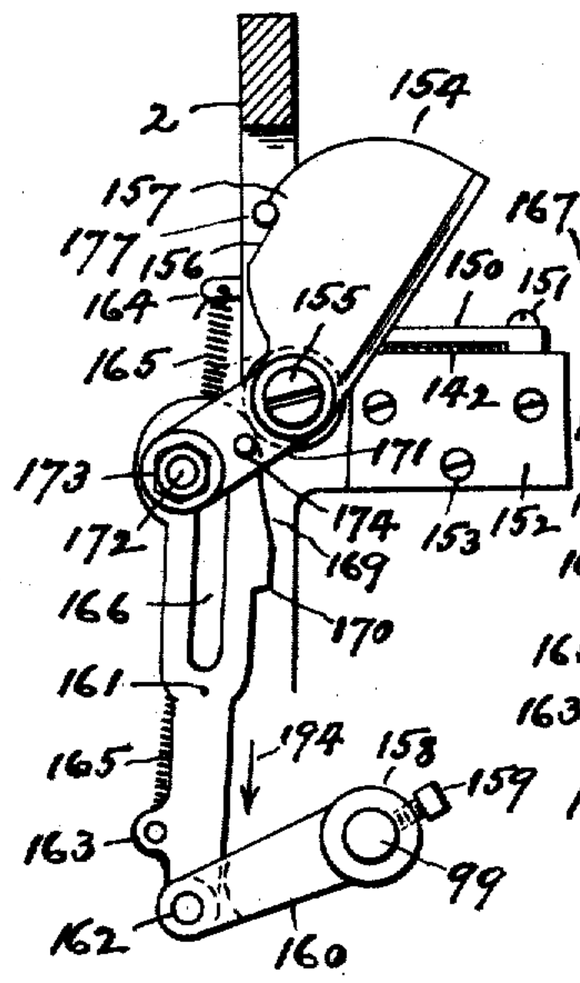

FIG. 12.

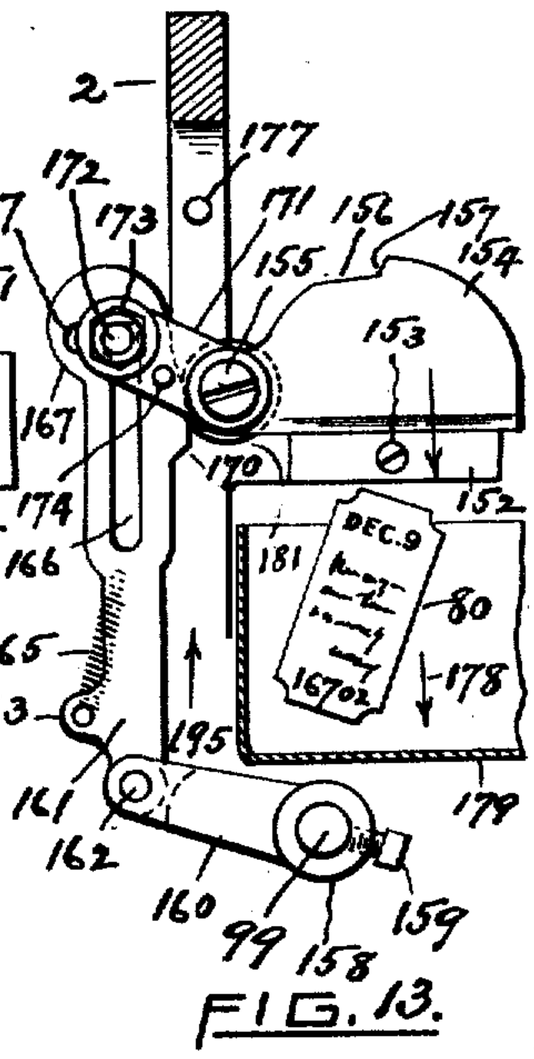

FIG. 13.

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UNITED STATES PATENT OFFICE.

FRANK J. ROWSE, OF PAWTUCKET, RHODE ISLAND.

COIN-CONTROLLED TICKET-VENDING MACHINE.

995,988. Specification of Letters Patent. Patented June 20, 1911.

Application filed January 20, 1909. Serial No. 473,290.

To all whom it may concern:

Be it known that I, FRANK J. ROWSE, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Coin-Controlled Ticket-Vending Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

Like reference numerals indicate like parts.

Figure 1 is a front elevation of my improved ticket vending machine, as seen on line *x*—*x* of Fig. 3. Fig. 2 is a plan view of the cardboard strip, which is to be printed, cut and delivered by said machine. Fig. 3 is a view of said machine, partly in elevation and partly in section as seen on line *z*—*z* of Fig. 1. Fig. 4 is a view in elevation of the parts of said machine, seen on line *y*—*y* of Fig. 3. Fig. 5 is a view in elevation of a ratchet wheel and pawl, constituting one of the stop mechanisms of my said invention. Fig. 6 is an elevation of the sprocket ring, which is a part of the feeding mechanism. Fig. 7 is a front elevation of the cabinet and front plate of my machine, the interior mechanism being indicated by dotted lines. Fig. 8 shows in side elevation the coin-actuated device, which is the motive apparatus of said machine, as seen in its normal inoperative position. Fig. 9 is a front elevation of said coin device, as seen in its normal inoperative position, the section being on line *v*—*v* of Fig. 8. Fig. 10 is a front elevation of said device, as seen on line *v*—*v* of Fig. 8 at the end of the cutting operation, when the coin is discharged therefrom. Fig. 11 shows an elevation of the cutting mechanism for dividing said cardboard strip into separate tickets to be delivered, said mechanism being represented in its normal inoperative position, as seen on line *w*—*w* of Fig. 1. Fig. 12 is an elevation of the cutting mechanism, on said line *w*—*w* as seen at the instant when the cutter is to begin its said operation. Fig. 13 is an elevation of the cutting mechanism as seen on said line *w*—*w* at the instant when the cutter has finished its operation and the ticket has been completely severed from the cardboard strip.

My invention relates to coin-controlled vending machines, adapted to print, cut and deliver tickets; and it consists of the novel construction and combination of the several parts as hereinafter described and set forth in the claims.

In the drawings 1 designates the front plate of the machine, and 2 the back plate thereof. A cabinet or case 3 has the base 4 and a top or cover 5. The front side 6 of the case 3 is detachable, and is fastened by a lock 7, whose bolt 8 enters a mortise in the top or cover 5 and is operated by a key inserted in the key hole 9.

The front plate 1 has a window or aperture 10, through which the ticket is delivered upon a shelf 11. The front side 6 of the cabinet 3 is cut to give a rectangular opening, as indicated by solid lines in Fig. 7, behind which aperture, so made, the front plate 1 extends and is secured. A crank or operating handle 12 extends through the front plate. The crank 12 has a knob 13. The stop pin 14, projecting from the front plate 1, limits the upward movement of the crank 12, and the stop pin 15, projecting from the front plate 1, limits the downward movement of the crank 12. The extent of the movement of the crank 12 is 72°, that is, one-fifth of one revolution. The front plate 1 has a coin aperture 16, as shown in Fig. 7.

The back plate 2 has the feet 17, upon which the machine is supported within the case 3. A standard or post 18 has a flanged base 19 and is mounted upon the upper portion of the back plate 2 and secured thereto by bolts 20. The upper end of the post or standard 18 is bent like an inverted L, as represented by dotted line 21 in Fig. 1, and supports two parallel bars or arms 22, 23, the latter being shown in Fig. 1, as broken off, near one end thereof, in order to represent such parallel arrangement. The said bars 22, 23 and the said horizontal portion of the standard 18 have each a tubular hub or bearing 24. A fixed shaft 25 extends through said three bearings, 24 and is secured and held from rotation therein by a set screw 26. A spool 27 is loosely mounted on the shaft 25, between the arms 22, 23, and a strip of cardboard is coiled upon the spool 27, as shown at 28. A weighted arm 29, has a bearing 30, secured thereto at one end by means of the screws 31, and a pivot pin or rod 32 extends between the arms 22,

23, and passes loosely through said bearing 30. The weighted arm 29 rests and exerts a pressure upon the roll or coil 28 of cardboard.

A shaft 33 has an annular shoulder 34 and is mounted in the back plate 2 of the machine. Its outer end, which is reduced in diameter, as shown in Fig. 3, is screw-threaded for the reception of a nut 35, by means of which the shoulder 34 is brought into forcible contact with the back plate 2 and so the shaft 33 is held from rotation. The inner end of the shaft 33 has a concentric bore, as represented in Fig. 3. A crank shaft 36 is rotatably mounted at its inner end in said concentric bore of the fixed shaft 33, and at its outer end in an aperture or bearing of the front plate 1.

The shaft 36 is operated by the crank 12. A collar 37 is mounted on the crank shaft 36 and is fastened thereto by a cross pin 38. The collar 37 abuts on one side the inner end of the fixed shaft 33.

Two parallel side plates 39, 40, are mounted fast on the crank shaft 36 and turn with it, the plate 40 having a hub 41, as shown in Fig. 3. A front coin plate 42 extends between and is supported by the side plates 39, 40, and is provided with a central vertical slot 43. A hood or curved plate 44 is mounted by screws 45, so as to extend parallel with the plate 42, the intervening space constituting a coin chute 46. The upper end of this coin chute registers with the coin aperture 16 of the front plate 1. At the bottom of the coin chute 46 the two coin rests 47 support the coin 48, as seen in Figs. 8 and 9. A spring 49, secured at one end to the side plate 39, as shown at 50, and at the opposite end by a hook engaged in a bracket 51, which extends from the front plate 2, serves to keep the side plate 39 and its connected parts in the normal inoperative position illustrated in Figs. 3, 8 and 9, and also keeps the crank arm 12 normally in contact with the stop pin 14, as in said figures. A coin ejector 52 extends in a bracket form from the inner side of the front plate 1, being fastened thereto by the screws 53 and is in alinement with the slot 43 of the front coin plate 42, as best seen in Fig. 8.

A sleeve or tube 54 is loosely mounted on the crank shaft 36 and has an integral pawl-feed plate 55. The sleeve or tube 54 abuts at one end against the hub 41 of the coin sideplate 40 as shown in Fig. 3. A feed pawl 56 is pivotally mounted at 57 to an extension 58 of the plate 55. A spring 59, fastened by a screw 60 to the edge of the plate 55, has its free end in forcible contact with the pawl 56.

A link bar 61 has one eye at its upper end by which it is pivotally mounted on a stud or pin 62, which projects from the plate 55.

On the sleeve or tube 54 is a toe 63, whose tip extends through the slot 43 of the front coin plate 42. Its operation will be presently explained.

A ratchet wheel 64 is loosely mounted on the crank shaft 36. It has five equi-spaced ratchet teeth 65, on each side of each of which ratchet teeth are sockets 66 and 67, respectively.

A sprocket wheel 68 is mounted rotatably on the fixed shaft 33. This wheel has a concentric hub 69 to fit around the collar 37, also a concentric hub 70 for the reception of the sprocket rings 71, and also a concentric hub 72 for the reception of the gear 73 and for the reception of the rear ratchet wheel 75.

The ratchet wheel 64 is fastened by screws 76 to the front face of the sprocket wheel 68, and the free end of the pawl 56 engages successively with the sockets 67 of said ratchet wheel 64. Two sprocket rings 71 are mounted on the sprocket wheel 68, on the front and rear faces thereof, respectively, and are secured thereto by screws which pass through screw holes 77. Each sprocket ring 71 has a central circular aperture 78, as seen in Fig. 6, by which it fits upon the hub 70 of the wheel 68. Each ring 71 has five equi-spaced teeth or sprockets 79.

On the rear face of the wheel 68 is said rear ratchet wheel 75, separately shown in Fig. 5. It has five equi-spaced ratchet teeth 81, and also a central circular aperture 82, by which it is mounted on the hub 72 of the wheel 68. It is fastened by screws 83, which pass through the gear 73 and ratchet wheel 75 (through the screw holes 84 of the latter) into the wheel 68. The wheel 68 also has two parallel annular flanges 85, as seen in Figs. 1, 3 and 4.

The front plate 1 is supported from the back plate 2 by six rods 86, 87, 88, 89, 90 and 91, as shown in Figs. 1, 4 and 7, on each of which rods are heads at one end and nuts at the opposite end, respectively. On the rod 91 is loosely mounted a V-shaped or bent stop pawl or lever 92, whose upper end 93, having an acute-angled tip, is successively engageable with the teeth 81 of the rear ratchet wheel 75, as best seen in Fig. 5, and whose lower end 94, having an acute-angled tip, is successively engageable with said ratchet teeth 81, as best seen in Fig. 4. When the tip 93 is engaged with a ratchet tooth 81, the tip 94 is disengaged from a ratchet tooth 81 and vice versa. A spring 95 has one end hooked, as at 96, to engage with the stop pawl 92 through an eye or opening 97 therein and the opposite end is formed into a loop to engage a stud or pin 98, which extends from the rear plate 2.

A shaft 99 is mounted loosely in the journaled bosses 100, 101 and 102. A weighted arm 103, having a quarter-twist 104, is

loosely mounted on the shaft 91, and is normally held in forcible contact with the card board strip (hereinafter described) upon the sprocket wheel 64, by means of the spring 105, one end of which is hooked into a hole in said arm 103, and the opposite end of which is looped upon a pin or stud 106 on the boss or journal 100.

An oscillatory movement is given to the shaft 99 by means of the link bar 61. A collar 107, which is fast upon the shaft 99, has a radial arm 108, whose outer end is formed with an eye. The lower end of the link bar 61 is hooked in said eye in order to engage with the radial arm 108.

A collar 109 is mounted on the shaft 99 and is held fast thereon by means of a set screw 110. An integral wedge-shaped cam 111 upon the collar 109 has an oscillatory movement with the shaft 99. Said cam cooperates with a toe 112, which extends from the stop pawl 92, as illustrated in Figs. 1 and 4.

A printing wheel 113 has a hub 114 and is mounted on a shaft 115. The shaft 115 has a head 116 at its front end, and its rear end is threaded and passes through the back plate and is held in position by means of a nut 117. The shaft 115 is shouldered, as shown at 118 in Fig. 3. A flat circular ring 119 is fastened by screws 120 to the front face of the printing wheel 113. The printing wheel 113 is driven by a gear 121, which is fastened by screws 122, passing into said wheel. The sprockets 79, engage with said wheel in sockets 123 thereof, as shown in Figs. 1 and 3.

The diameter of the gear 121 of the printing wheel 113 has such relation to the diameter of the gear 73 of the sprocket wheel 68 that the printing wheel performs one revolution in the same time that the sprocket wheel rotates four-fifths of a revolution.

The type upon the wheel 113 is shown at 124 in Fig. 3. It is in the form of a stereotyped strip, which has beveled edges, as shown. The ring 119 has its outer edge provided with a beveled lip to engage the front edge of the type strip 124, as seen in Fig. 3.

The printing wheel 113 has a rear flange 125 provided with a cam edge, and also carries a cam plate 126 concentric therewith and fastened by the screws 122 to said wheel. An arm 127 has a hub 128, by which it is mounted loosely on the rod or shaft 88. An arm 129 has a hub 130, by which it is mounted loosely on the rod or shaft 90, as seen in Figs. 1 and 4. The arm 127 has at its outer end a stud or pin 131, on which a roller 132 is rotatably mounted, said roller traveling along the periphery of the cam 125. The arm 129 has at its outer end a stud or pin 133, on which a roller 134 is rotatably mounted to travel along the periphery of the cam plate 126. The arm 127 has a post 135 and the arm 129 has a post 136. A spiral spring 137 has its ends hooked into said posts 135 and 136, respectively.

An ink roller 138 is rotatably mounted on the stud or pin 131 (which is preferably a screw, having a screw head 139) and an ink roller 140 is rotatably mounted on the stud or pin 133 (which is preferably a screw, having a screw head 141).

The strip of card board, which is to be printed, cut and delivered by this machine is designated as 142 and is shown in plan view in Fig. 2. On each edge it has a series of equi-spaced semicircular notches 143; those of one edge being exactly opposite those of the other edge *seriatim*. The dotted lines in Fig. 2 denote the lines of the cutting of the strip 142 into separate tickets, such as that marked 80 in Fig. 13.

A guide wheel 144 is rotatably mounted on the rod or shaft 87 and is provided with two opposite annular flanges, as shown in Fig. 1. A bracket 145 projects from the back plate 2. A curved spring 146 is fastened by screws 147 to the bracket 145 and is bent to conform to the curvature of the wheel 144. Said spring extends between the flanges of the wheel 144 and serves to press the strip 142 to the wheel, as illustrated in Fig. 1.

A bracket 148 extends from the back plate 2 and has a downwardly extending end or hanger 149. A guide plate 150 is fastened by screws 151 upon the bracket 148 and has a passage through it for the feed of the strip of cardboard to the cutting mechanism, as shown in Figs. 1, 11 and 12. A fixed blade 152 is fastened by screws 153 to the hanger 149.

A movable blade 154 is mounted on a screw pivot 155, which passes into the hanger 149. The blade 154 has the recess 156 and shoulder 157. The beveled sharp edge of the blade 154 has a shearing contact with the fixed blade 152, as shown.

On the shaft 99 is a sleeve or tube 158 held thereon by a set screw 159. A radial arm 160 extends from the sleeve or tube 158. A link bar 161 is pivotally mounted on the end of the arm 160, as shown at 162. The link bar 161 has an eye 163 and the back plate 2 has a stud or pin 164. A spiral spring 165 is secured at one end to the eye 163 and at its opposite end to the stud or pin 164. The link bar 161 has a longitudinal slot 166, which terminates at its upper end in a horizontal recess or socket 167. It also has a cam edge 169 and a shoulder or offset 170. On the back plate 2 is a fixed cam 181 against which the cam edge 169 of the link bar 161 operates. This fixed cam is represented by a circle in Figs. 11, 12 and 13 drawn in part by solid lines and in part by dotted lines.

The cutter or movable blade 154 has a

lever arm 171. A headed bolt 172 extends through the slot 166 of the link bar 161, and a nut 173 is mounted on the end of said bolt. The lever arm 171 has a stud of pin 174 and the back plate 2 has a stud or pin 175. A spiral spring 176 is fastened at one end to the stud or pin 174 and at the opposite end to the stud or pin 175.

The back plate 2 has a stud or stop pin 177 (see Fig. 13), with which the shoulder 157 of the movable blade or cutter 154 is adapted to contact as seen in Fig. 11.

When the ticket 80 has been severed from the strip 142, it falls, as indicated by the arrow 178, into a receptacle 179, as shown in Fig. 13, which receptacle is accessible through the window or opening 10 in the front plate 1.

The following is an explanation of the operation of my said machine: The cardboard strip 142, having been wound around the spool 27, is held thereon, against uncoiling, by means of the weighted arm 29, as shown in Fig. 1, and passes from the coil 28 in the direction indicated by the arrow 180 in Fig. 1, partially around the guide wheel 144, along over the portion of the spring 146, which lies upon the bracket 145 (being held frictionally by said spring against the wheel 144 to be drawn thereby) and thence passes, as indicated by the arrow 182, partially around the sprocket wheel 68, and thence between said wheel 68 and the printing wheel 113, thence along the shelf or bracket 148, as indicated by the arrow 183 in Fig. 1, and through the guide 150, and is there severed into tickets by the blades 152 and 154, being cut thereby into lengths (or separate tickets), as indicated by the dotted lines in Fig. 2, and as will be presently explained.

This machine is coin-controlled, and will not operate unless a proper coin has been inserted in the coin aperture 16. The side plates 39 and 40 and the crank 12 are normally held in the position shown in Fig. 7 by means of the spring 49. In this position the coin chute 46 registers with the coin aperture 16 and allows the insertion of a coin 48 through said aperture. When there is no coin in the machine to operate the same, the crank 12 and the side plates 39 and 40 are movable together in the direction indicated by the arrow 184 in an arc of oscillation limited by the stop pins 14 and 15 (see Fig. 9), but the toe 63 maintains its normal position so that no movement is communicated by said crank 12 and its connected parts to the other portions of the mechanism. When, however, a coin 48 is inserted through the coin aperture 16, said coin practically locks the parts so that they move together. The coin drops by gravity down through the coin chute 46 and is held at the bottom of said chute upon the coin rests 47, as illustrated in Figs. 8 and 9. The toe 63 is then in forcible contact with the coin 48, as shown in Fig. 9, and hence, as the crank 12 is turned from the stop pin 14 to the stop pin 15, the tube or sleeve 54 turns with the crank shaft 36, and with it the plate 55. This movement carries the link bar 61 from the position shown in Fig. 8 to the position shown in Fig. 9. As the plate 55 thus moves, the feed pawl 56, mounted on the projection 58 of said plate, engages that ratchet tooth 65 of the ratchet wheel 64, which is then adjacent thereto, and pushes the ratchet wheel 64 in the direction indicated by the arrow 185 in Figs. 1 and 4 one fifth of one revolution. As the ratchet wheel 64 is connected by the screws 76 to the sprocket wheel 68, one of the sprockets 79 engages with one of the sockets 123 of the printing wheel 113, as illustrated in Figs. 3 and 4. As the wheels 68 and 113 rotate together by means of the gears 73 and 121, the sprockets 79 of the wheel 68 in succession engage the sockets 123 of the wheel 113 and said sprocket at the same time engage the cardboard strip 142 in the notches 143. In this manner the strip 142 is drawn off from the spool 27 and is advanced between said wheels and passes to the cutters 152 and 154. The engagement of the stop pawl 93 with the ratchet tooth 81 of the rear ratchet wheel 75, prevents backward movement of the wheels 68 and 113. The toe 112 of the bent lever 92 serves to seat the stop pawl 93 in engagement with a ratchet tooth 81 and said toe derives its motion for this purpose by means of the cam 111 on the sleeve or tube 109, which is mounted on and turns with the shaft 99, said shaft 99 being rocked by the radial arm 108 (in the direction indicated by the arrow 187 in Fig. 8) which extends from the sleeve or tube 107 on said shaft and operated by the link bar 61. The bent lever 92 is retracted by the spring 96, which tends to seat the stop pawl 94 in the recess 67 of the ratchet wheel 64. The stop pawl 94 prevents overrotation. The sprocket wheel 68 has a pad, or several layers of paper, or other yielding substance, upon its periphery, between the flanges, as illustrated at 188 in Fig. 3. The cardboard strip 142, in passing between the printing wheel 113 and the sprocket wheel 68, is printed by the type 124 of the wheel 113 against the yielding surface 188 of the sprocket wheel 68.

This machine is represented in the drawings as adapted to print the cardboard strip in two colors, one color being imparted to the type by the ink roll 138 and the other color by the ink roll 140. The roller 132 of the arm 127 travels in the direction indicated by the arrow 189 in Fig. 4, along the periphery of the cam 125, and as the roller 132 passes over and along the high places of the cam 125, the ink roll 138 is lifted

away from the type 124 of the printing wheel 113. In like manner the roller 134 of the arm 129 travels in the direction indicated by the arrow 190 in Fig. 4, along the periphery of the cam plate 126, and as the roller 134 passes over and along the high places of the cam plate 126, the ink roll 140 is lifted away from the type 124 of the printing wheel 113. The spring 137 tends to draw the arms 127, 129, in the directions indicated by the arrows 191, 192, in Fig. 4 and so holds the rollers 132, 134 in constant contact with the cam 125 and the cam plate 126. The purpose of printing the card board strip 142 in two colors is that the date of the ticket may be distinctive and readily attract the eye, or some other distinguishing mark may be made thereon. When the cardboard strip 142 has been so printed it is moved along to the cutting mechanism to be severed into separate tickets 80 (Fig. 13). This operation is as follows: The oscillation of the shaft 99, caused by the link bar 61, as already described, produces a similar oscillation of the sleeve or tube 158, which is fastened on said shaft by the set screw 159, as seen in Figs. 1 and 11. The radial arm 160 of the sleeve or tube 158 is pivotally connected at 162 with the link arm 161. The normal position of this link arm is shown in Fig. 11. At that time, the movable blade 154 has its recess 156 and shoulder 157 in forcible contact with the stop pin 177 of the back plate 2, being held to said position by the spiral spring 165, which extends from the eye 163 of the link bar 161 to the stud or pin 164 of the back plate 2. As the link bar 61 moves the radial arm 108 of the sleeve or tube 107 in the direction indicated by the arrow 187 in Fig. 8, so rocking the shaft 99, the oscillation of the shaft 99 moves the radial arm 160 in the direction indicated by the arrow 193 in Fig. 11. This movement pulls down the link bar 161 in the direction indicated by the arrow 194 in Fig. 12. The link bar 161 thus travels along the slot 166 in contact with the bolt 172, which passes through said slot, until said bolt comes into alinement with the horizontal slot 167, whereupon said link bar, under the influence of the diagonally extending spiral spring 165, seats the link bar 161 by its slot 167 upon the bolt 172, as represented in Fig. 12. Then, when the link bar 161 begins to move upward as indicated by the arrow 195 in Fig. 13 (such upward movement being caused by the movement of the crank 12, from the stop pin 15 to the stop pin 14, and the consequent return oscillation of the shaft 99) the cam edge 169 of the link bar 161, moving along a fixed cam 181 upon the back plate 2, presses the upper end of the link bar 161 outwardly, thus withdrawing it from its engagement with the bolt 172 in said slot 167, whereupon said bolt 172 is in alinement with the slot 166 of the link bar 161, and then the spring 176 carries the link bar 161 from the position shown in Fig. 13 to the position shown in Fig. 11. After the lever arm 171 has been engaged by the bolt 172 in the slot 167 of the link bar 161, the rise of the link bar 161 causes the movable blade 154, while its lever arm 171 continues in such engagement, to move from the position shown in Fig. 12 to the position shown in Fig. 13, thus slicing by the coöperation of the movable blade 154 and the fixed blade 152, in a shearing operation, the cardboard strip 142 along the line indicated by dots 143 in Fig. 2, and the ticket 80, so cut off, drops by gravity in the direction indicated by the arrow 178, into the receptacle 179. The spring 176, which has been expanded by the movement of the blade 154 from the position shown in Fig. 12 to the position shown in Fig. 13, when free to act, pulls down the lever arm 171, thus elevating the blade 154 to its former and normal position again. The cardboard strip 142, in passing between the sprocket wheel 68 and the printing wheel 113, is engaged by the sprockets 79 of the ring 71 in the notches 143 of the strip 142. Thus the strip is fed in proper alinement with said wheels 68 and 113 and there is no slippage of said wheels thereon, so that the tickets 80 are accurately sheared off on a line extending straight across the strip from one notch 143 to the notch 143 directly opposite.

The automatic ejection of the coin 48 is illustrated in Fig. 10. When the coin is inserted, as in Fig. 9, it slides down upon the sloping surface of the back plate, within the chute, into contact with the coin rests 47, such movement being due to gravity. But when the coin apparatus has been moved from the position shown in Fig. 9 to the position shown in Fig. 10, a distance of 72° in extent, said coin chute 46 is considerably advanced beyond a vertical position, the toe 63 no longer presses the coin 48 to the coin rests 47, and the coin falls forward. The fixed bracket 52, when the crank 12 has brought the slot 43 of the plate 42 into such position as to allow said bracket to be received within the slot 43, as illustrated in Fig. 10, lifts and dislodges the coin, which drops into any suitable coin receptacle within the case.

The spring 165 is the main spring of the entire machine. It operates the movable cutter 154 in its cutting function illustrated in Fig. 13; it returns the shaft 99 (and its tubes or sleeves 107 and 109) to the normal position, thus putting the stop pawl 93 into locking engagement with the rear ratchet wheel 75, and at the same time pulls down the link bar 61 and so returns the pawl plate 55 and the toe 63 from the position shown in Fig. 10 to the position shown in Fig. 9.

The spring 165 is much stronger than the other springs in the machine. The sleeves 109 and 158 are adjustably set upon the shaft 99 by experiment in order to time the different operations correctly and are held in such adjusted position by the set screws 110 and 159, respectively. Thus just before the cam 169 of the link bar 161 gets almost back to its normal position the movable cutter descends and rises again by the respective action of the springs 176 and 165.

Instead of slicing off the tickets 80 from the cardboard strip 142 by a shearing action of cutting blades 152, 154, such blades may be dispensed with and in that case the ticket seized by the hand of the vendee may tear off or detach the ticket from the strip by means of a sharp edge of the hanger 149.

I claim as a novel and useful invention and desire to secure by Letters Patent:—

1. In a ticket vending machine, the combination of a pivotally mounted plate; means for imparting an oscillatory movement to said plate; a rock shaft; an arm projecting radially from said shaft; a feed wheel adapted to give longitudinal intermittent movement to a strip of cardboard; a ratchet wheel mounted fast on the feed wheel concentrically therewith; a pawl pivotally mounted on said plate and engageable with the ratchet wheel; and a link bar pivotally mounted at one end upon said radial arm and pivotally mounted at the opposite end upon said plate.

2. In a ticket vending machine the combination of a pivotally mounted plate; means for impairting an oscillatory movement to said plate; a rock shaft; an arm projecting radially from the shaft; a collar mounted fast on the shaft; a cam on the collar; a feed wheel adapted to give longitudinal movement to a strip of cardboard, a ratchet wheel fastened on one side of the feed wheel concentrically therewith; a second ratchet wheel fastened on the opposite side of the feed wheel concentrically therewith; a pawl pivotally mounted on the plate and engageable with the first named ratchet wheel; a link bar pivotally mounted at one end upon said radial arm and at the opposite end upon said plate; and a spring-pressed pivotally mounted V-shaped lever (which is operable by said cam and engageable with the second named ratchet wheel, one end thereof in alternation with the opposite end thereof.

3. In a ticket vending machine, the combination of a pivotally mounted plate; means for imparting an oscillatory movement to the plate; a rock shaft; an arm projecting radially from the shaft; a feed wheel adapted to give longitudinal movement to a strip of cardboard; a ratchet wheel fastened on the feed wheel concentrically therewith a pawl pivotally mounted on the plate and engageable with the ratchet wheel; a link bar pivotally connected at one end with the plate and at the opposite end with the radial arm; a printing wheel rotatably mounted on a support and adapted to print the cardboard strip which passes between the feed wheel and printing wheel; means intermittent the feed wheel and printing wheel adapted to impart rotary movement from the former to the latter; a fixed blade; an oscillating blade pivotally mounted on a support and adapted to coöperate with the fixed blade as shears to sever said strip at intervals; a collar fastened on the rock shaft; an arm extending radially from the collar; and a spring-actuated link bar pivotally connected at one end with the oscillating blade and at the opposite end with the second named radial arm.

4. In a ticket vending machine, the combination of a pivotally mounted plate; means for imparting an oscillatory movement to the plate; a rock shaft; an arm projecting radially from the shaft; a link bar pivotally connected at one end with the plate and at the opposite end with said arm; a feed wheel having a series of sprockets on its periphery; means intermediate said plate and wheel adapted to impart rotary movement to the wheel from the plate; and a printing wheel mounted rotatably on a support and provided with peripheral sockets adapted to engage *seriatim* with said sprockets of the feed wheel to feed a cardboard strip.

5. In a ticket vending machine, the combination of a pivotally mounted plate; means for imparting an oscillatory movement to the plate; a rock shaft; an arm projecting radially from said shaft; a link bar pivotally connected at one end with said plate and at the opposite end with said arm; a feed wheel having a series of sprockets on its periphery; means intermediate said plate and wheel adapted to impart rotary movement to the wheel from the plate; a printing wheel mounted rotatably on a support and provided with peripheral sockets adapted to engage *seriatim* with said sprockets of the feed wheel to feed a cardboard strip, a spring-pulled arm loosely mounted on a shaft; and an ink roll upon the last named arm for supplying ink to the printing wheel.

6. In a ticket vending machine, the combination of a rotatably mounted feed wheel having a series of peripheral sprockets and adapted to give longitudinal movement to a cardboard strip thereon; means adapted to rotate said wheel; a rotatably mounted printing wheel having a series of peripheral sockets with which said sprockets of the feed wheel are engageable consecutively; a cam on the printing wheel concentric therewith and having one or more high places; a cam plate concentric with the printing wheel and adjacent to the said cam and provided with

one or more high places, which are arranged in alternation with the high places of said cam; a pivotally mounted arm having a roller in rolling contact with said cam and provided with an ink roll; a pivotally mounted arm having a roller in rolling contact with said cam plate and provided with an ink roll; and a spring adapted to keep said rollers in constant contact with said cam and cam plate, respectively.

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

FRANK J. ROWSE.

Witnesses:
HOWARD A. LAMPREY,
WARREN R. PERCE.