United States Patent

Smith

[15] **3,662,681**

[45] **May 16, 1972**

[54] TICKET PRINTING AND ISSUING MACHINE WITH ROLLER INKER MEANS

[72] Inventor: **Robert D. Smith,** Richboro, Pa.

[73] Assignee: **Avery Products Corporation,** San Marino, Calif.

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[21] Appl. No.: **23,783**

[52] **U.S. Cl.** **101/68,** 101/292

[51] **Int. Cl.** **B41j 27/12,** B41j 15/00, B41j 1/46

[58] **Field of Search** 101/68, 66, 67, 69, 291, 292, 101/295, 90, 288

[56] **References Cited**

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Primary Examiner—William B. Penn

Attorney—Leonard L. Kalish

[57] **ABSTRACT**

A ticket or label printing and issuing machine, including a pivotally mounted type-head having a plurality of type-wheel modules whose axes are parallel but spaced apart from one another so as to place their downwardly facing selected printing type elements into separate spaced-apart print-lines, each type-wheel having a set of printing type elements along one-half of its periphery and a corresponding set of indicator type elements along the other half of its periphery facing upwardly, each type module having a separate impression-adjusting means, the type-head being releasably locked in its operative position and being swingable to an open access position, and a print-impression and tape-feed head operatively disposed beneath the type-head and including a tape-supporting press-platen and tape-feed-bed and tape-feeder carried on pivoted arms and arranged to be oscillated up and down between an upper printing position and a lower retracted position, and a pivotally mounted inker arranged to be oscillated in a path transverse to the oscillating path of the print-impression and tape-feed head between an inking position and a retracted position, and eccentric means for oscillating the print-impression and tape-feed head between its upper and lower positions and for oscillating the inker between its inking and retracted positions in timed relation to each other so that the inker is moved through its inking and retracting motions while the print-impression and tape-feed head is retracted, and so that the latter is moved through its print-impression and retracting motions while the inker is retracted.

6 Claims, 27 Drawing Figures

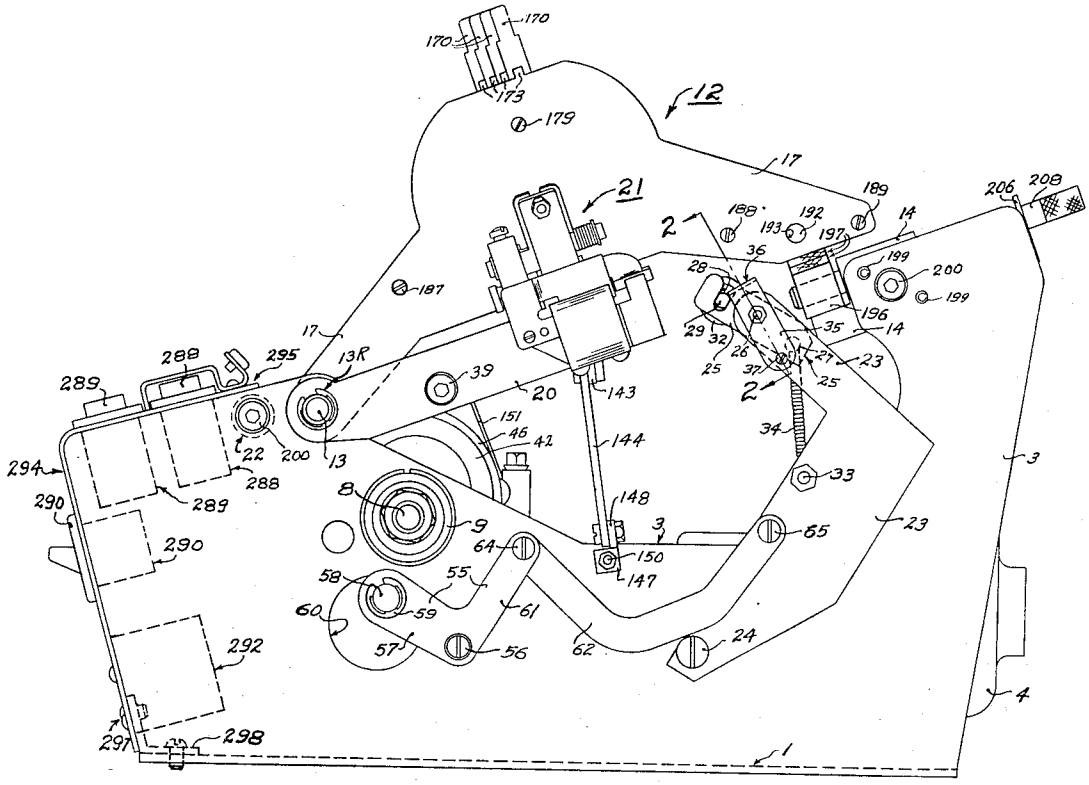


FIG. 1

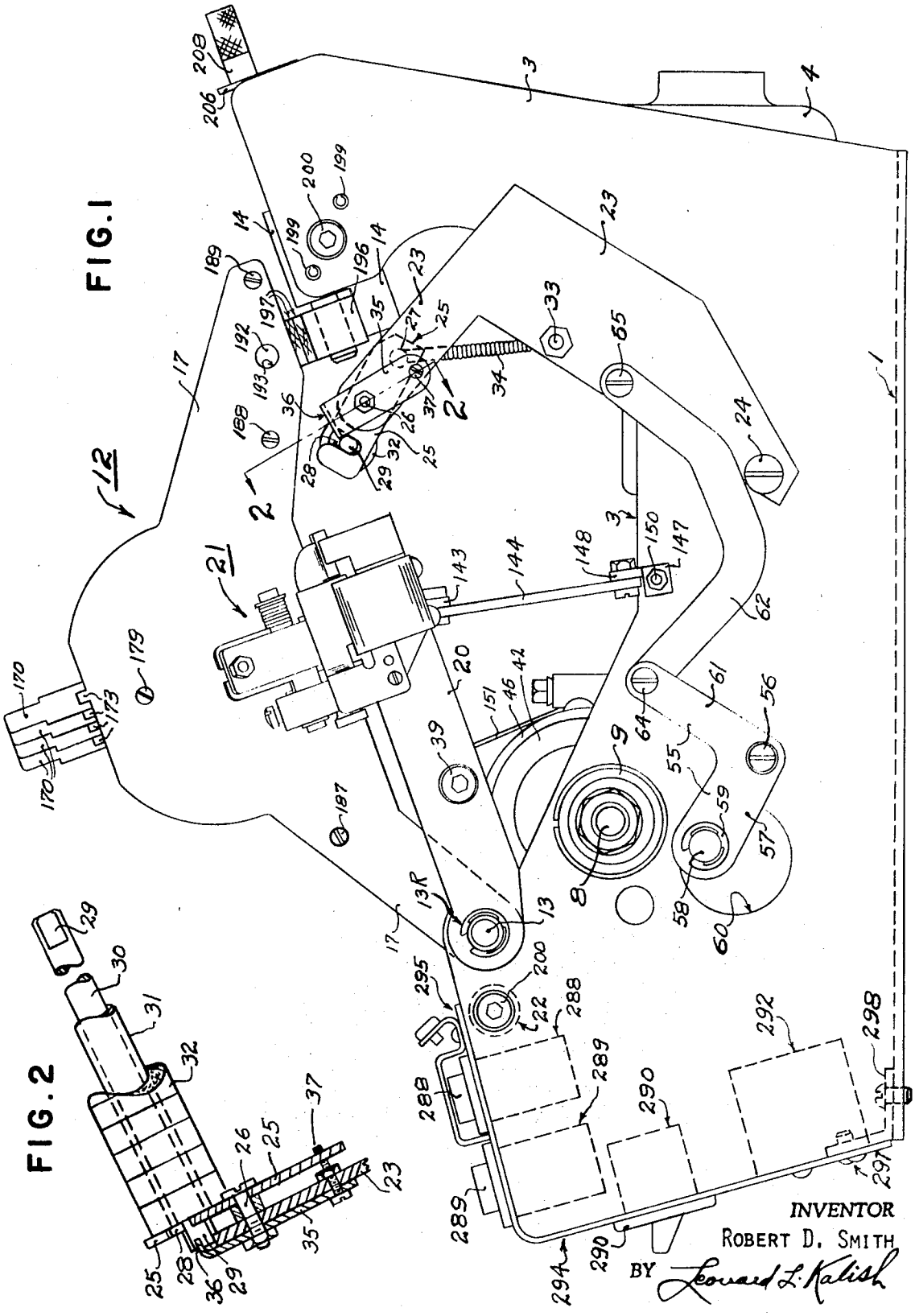


FIG. 2

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FIG. 3

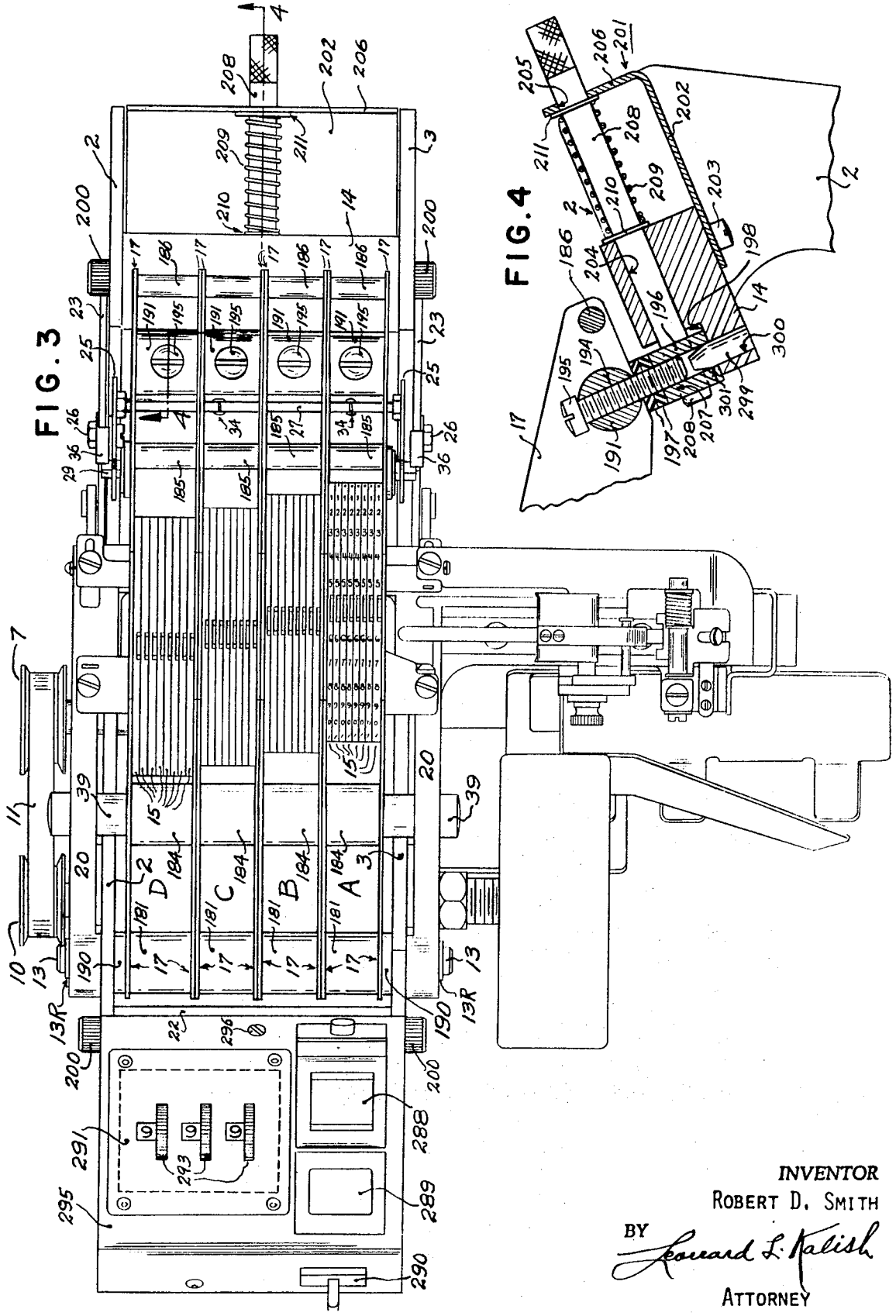


FIG. 4

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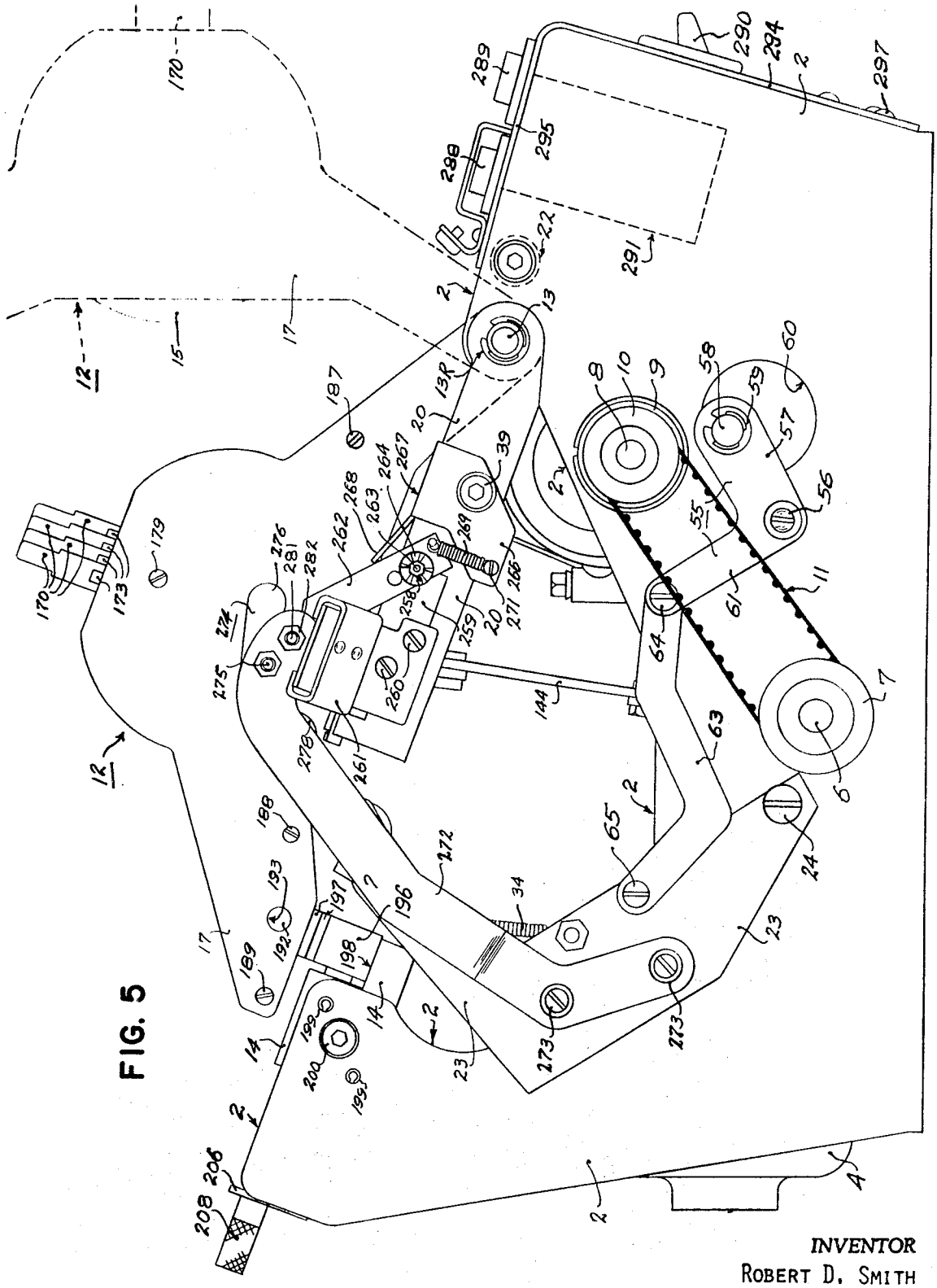


FIG. 5

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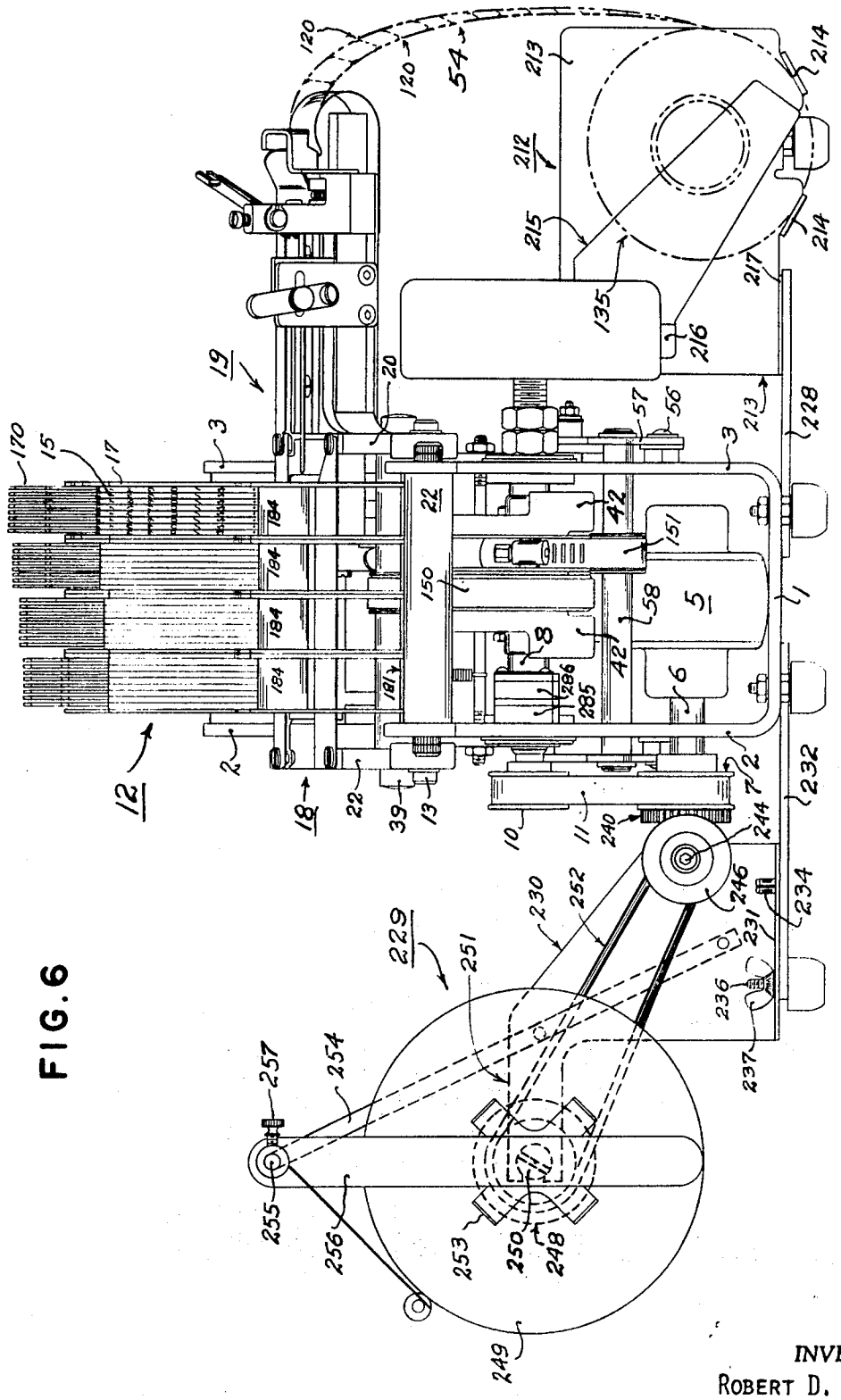
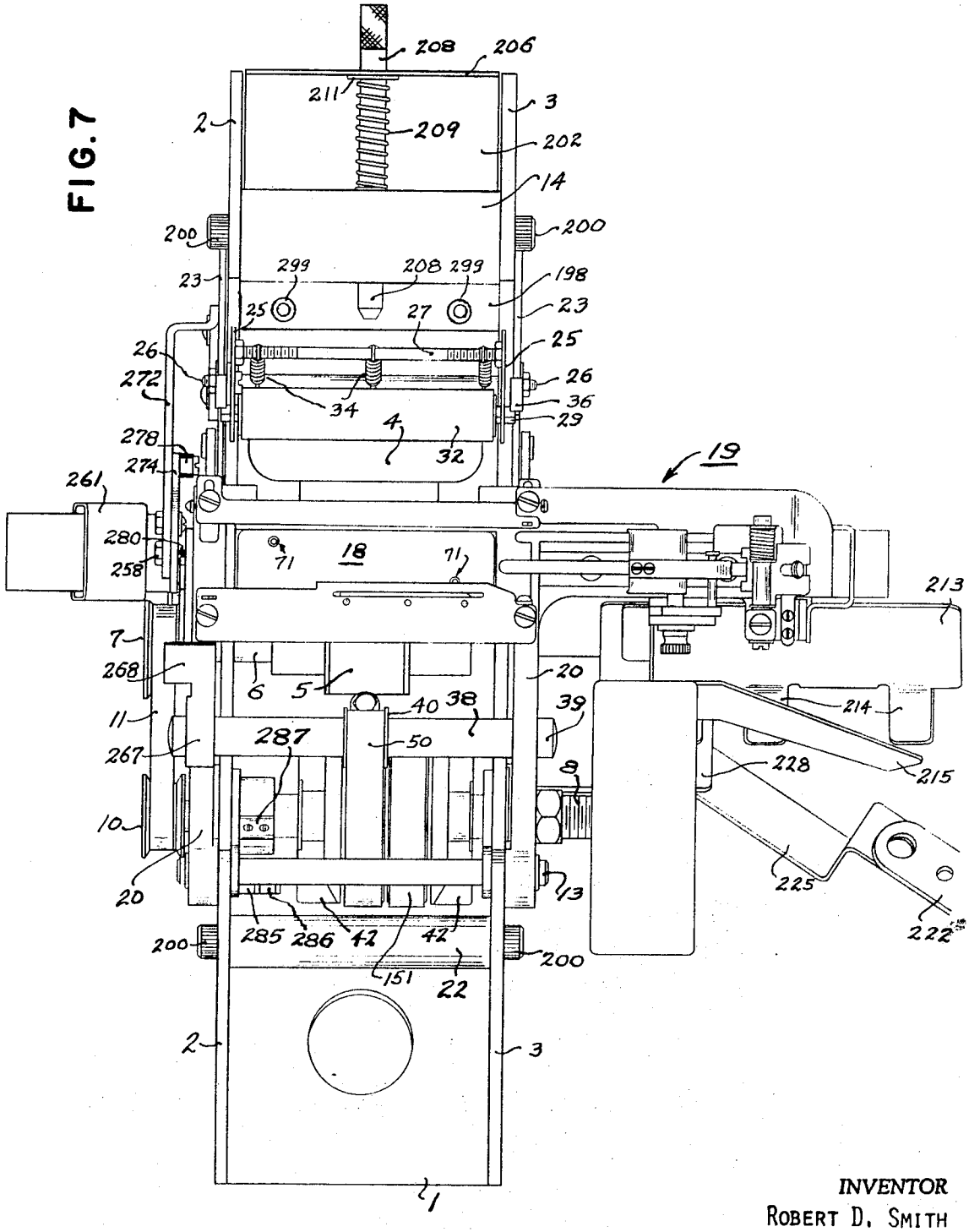


FIG. 6

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FIG. 7


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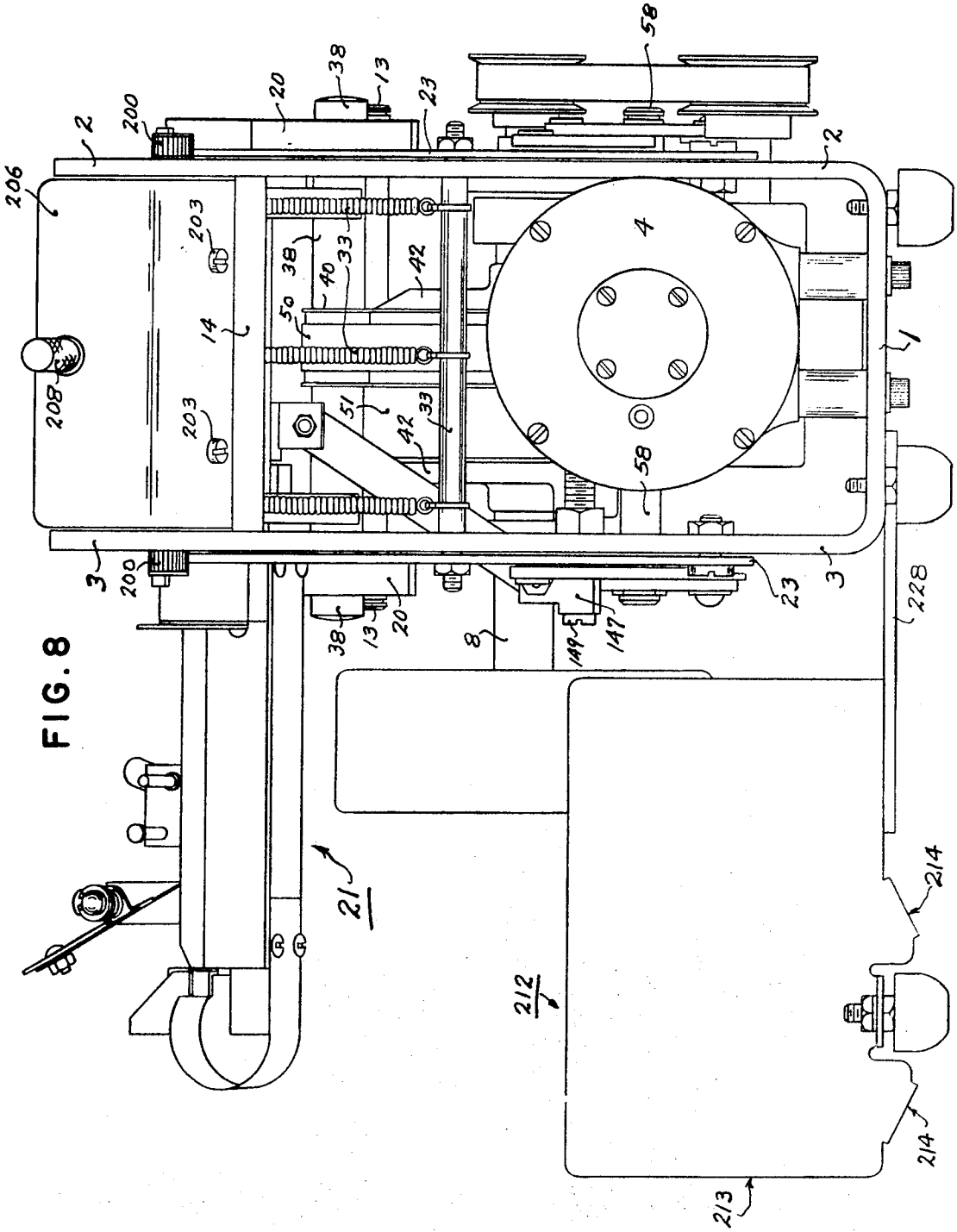
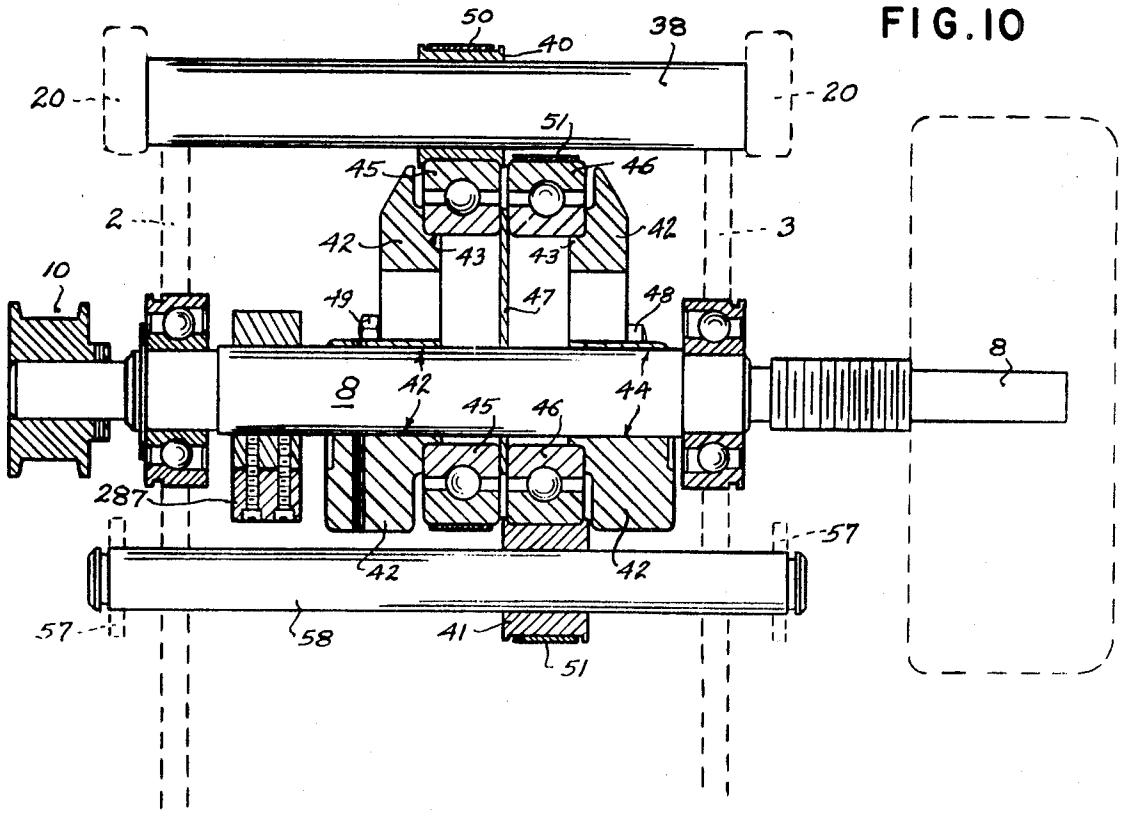


FIG. 8

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FIG. 10



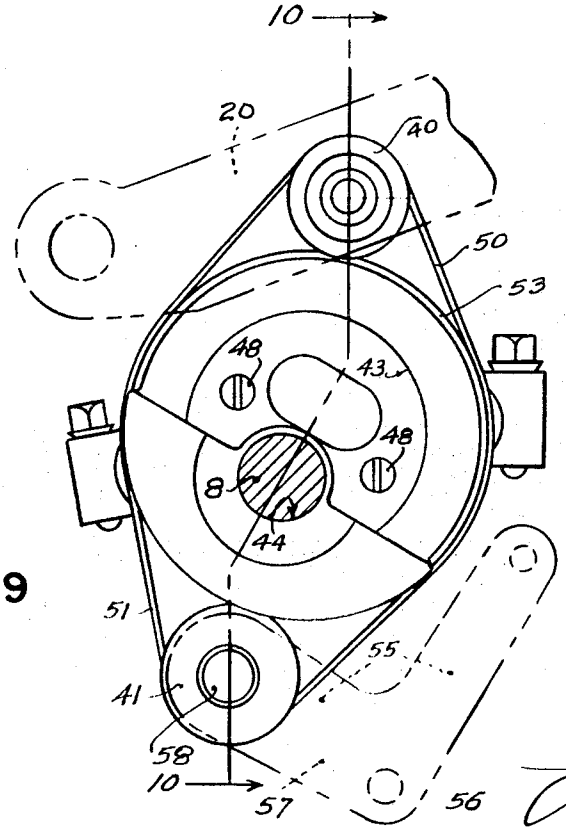


FIG. 9

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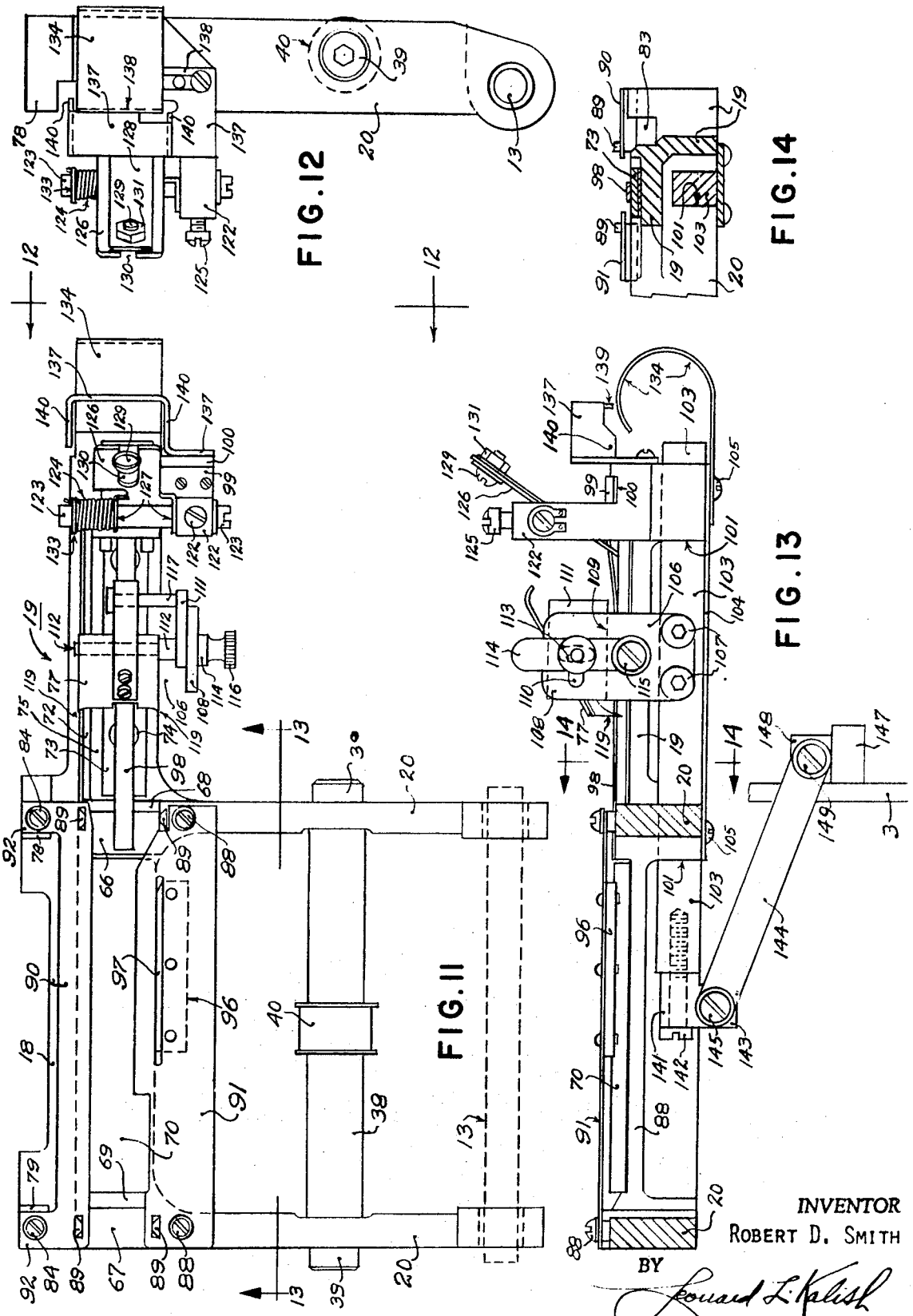


FIG. 12

FIG. 14

FIG. 13

FIG. 11

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FIG. 15

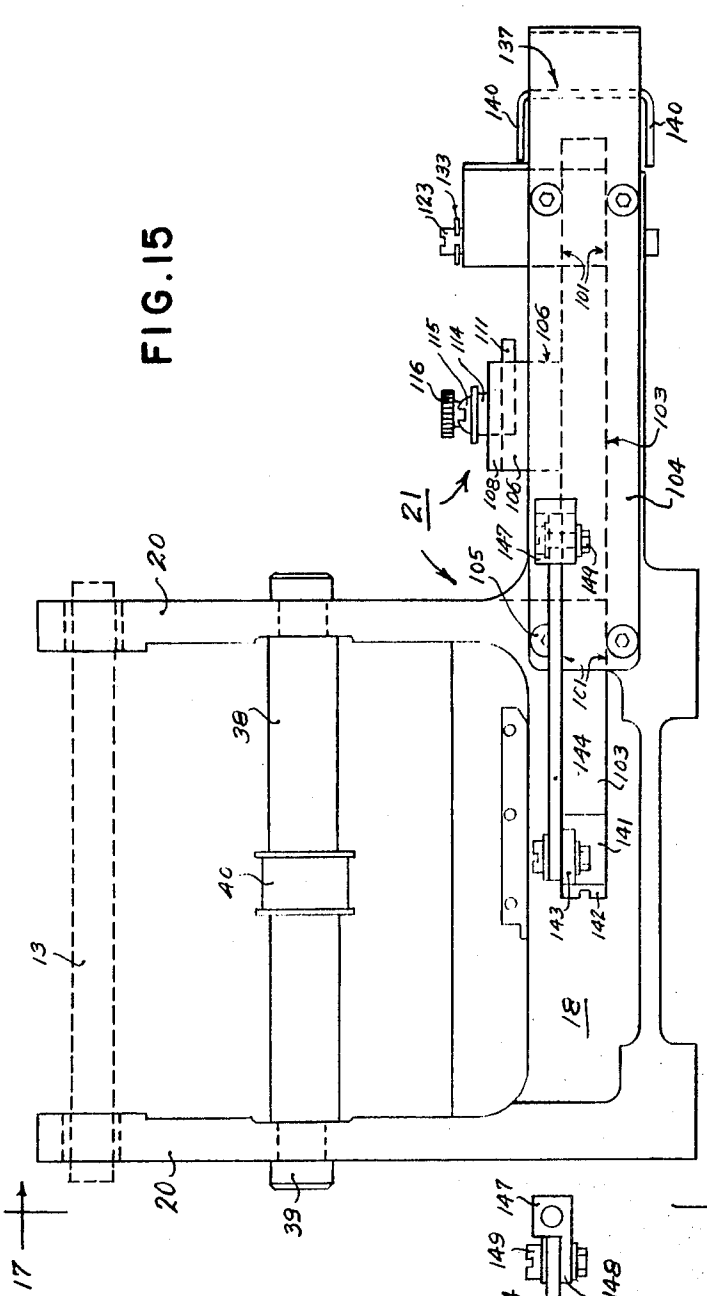


FIG. 16

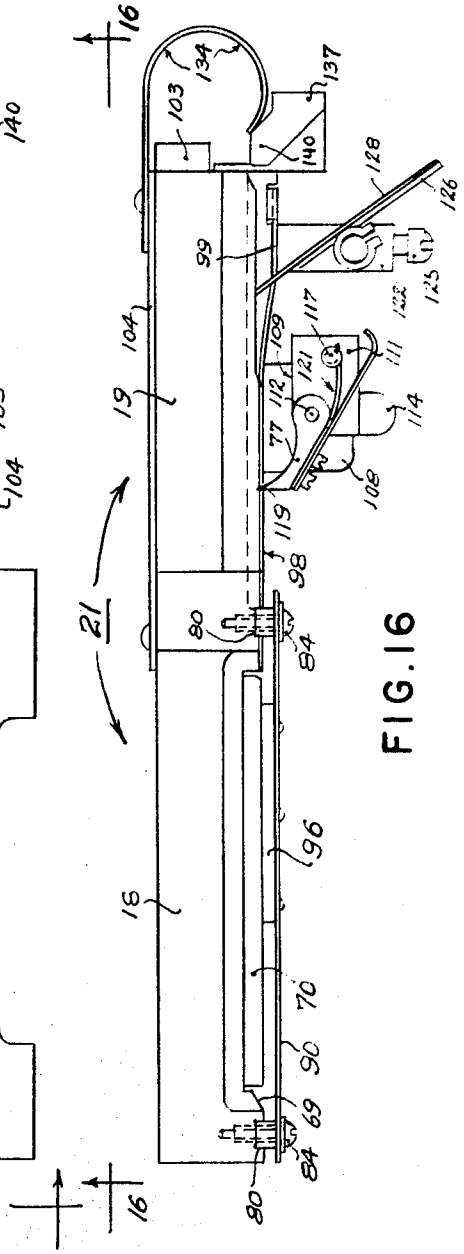
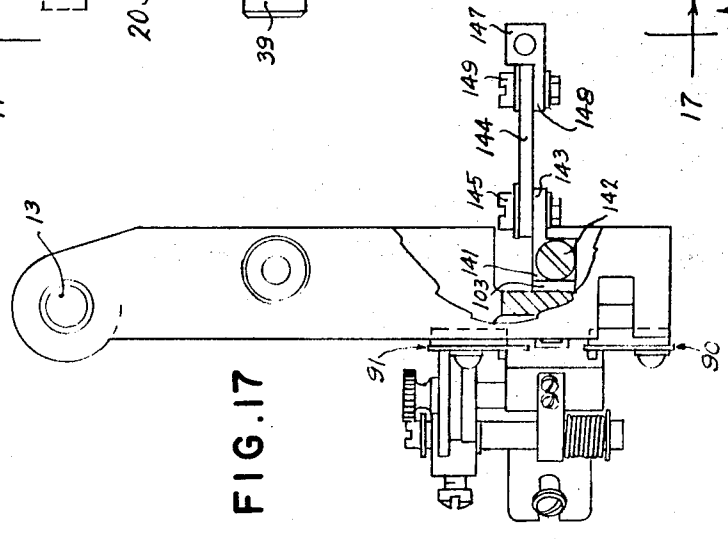


FIG. 17



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FIG. 19

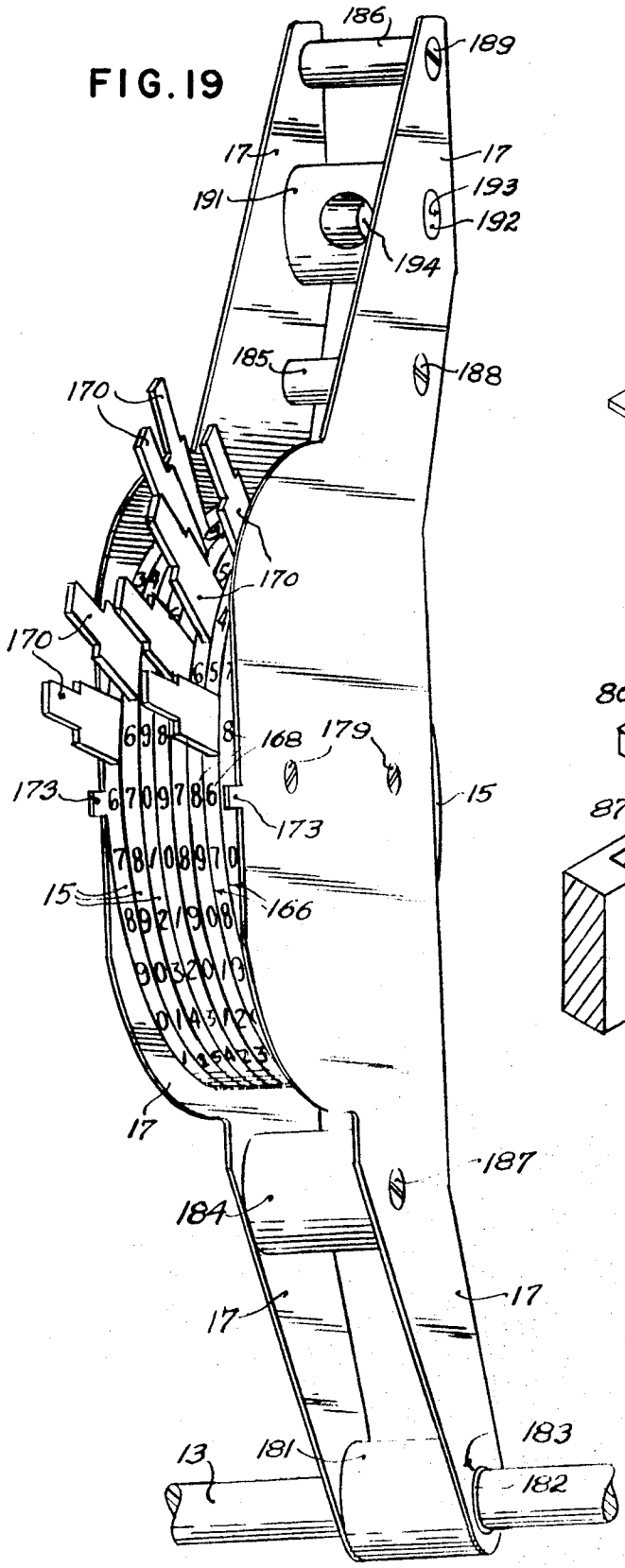
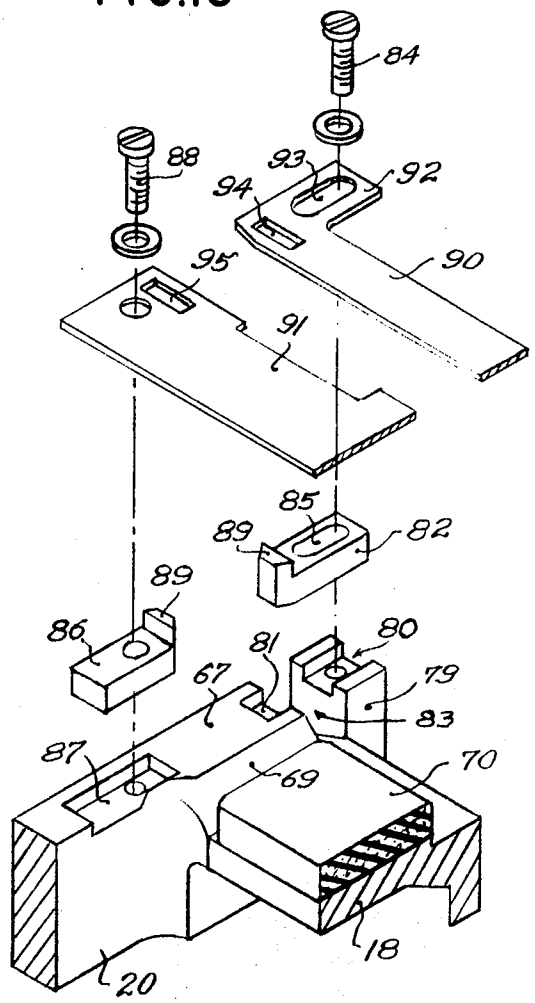
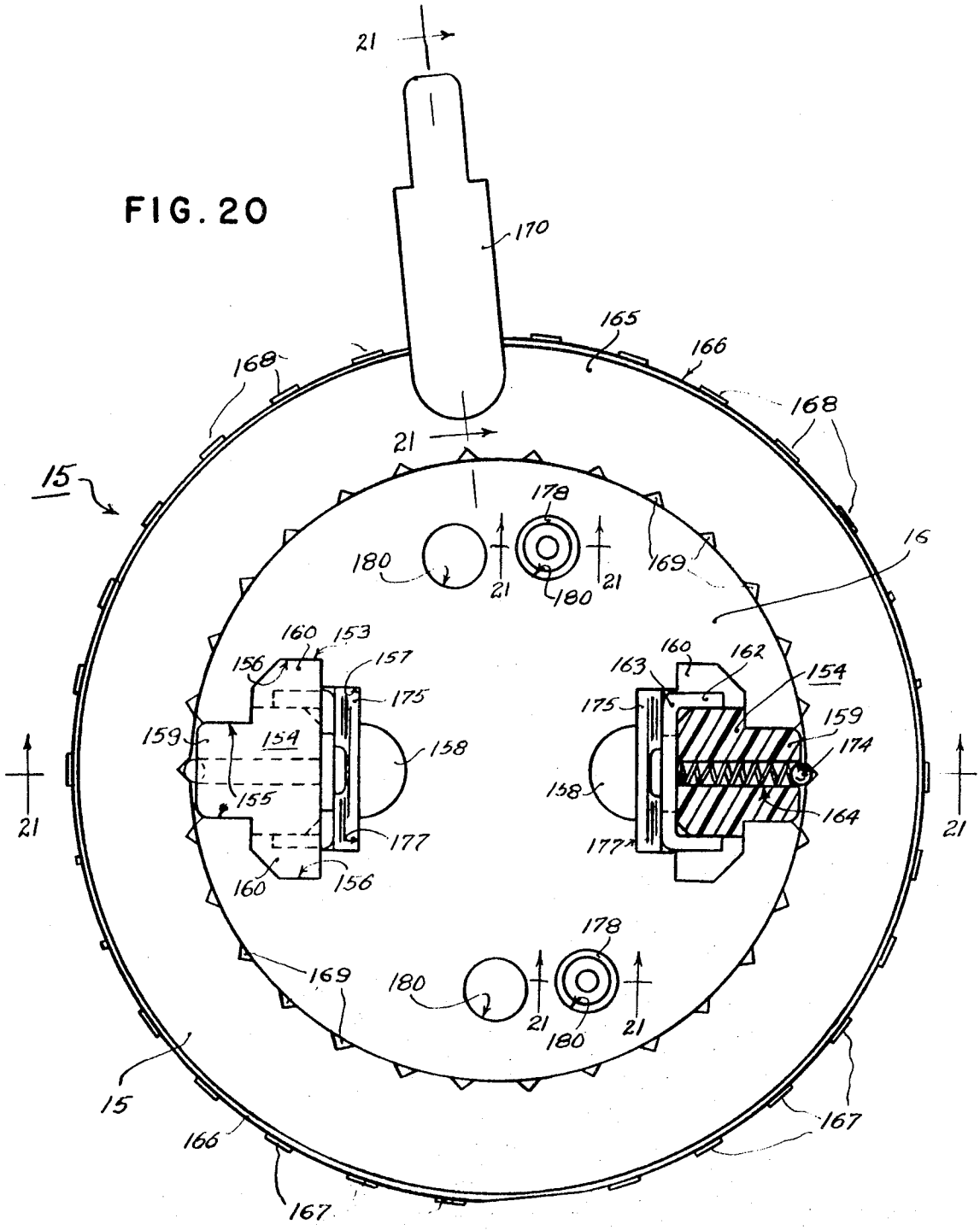


FIG. 18



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FIG. 20



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FIG. 22

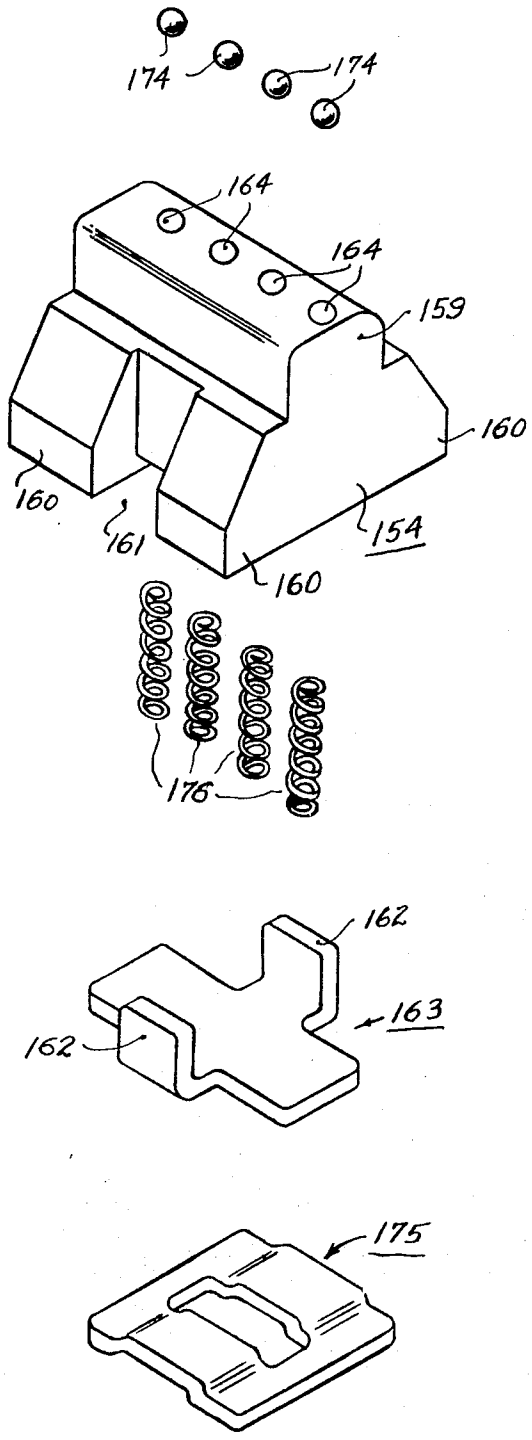
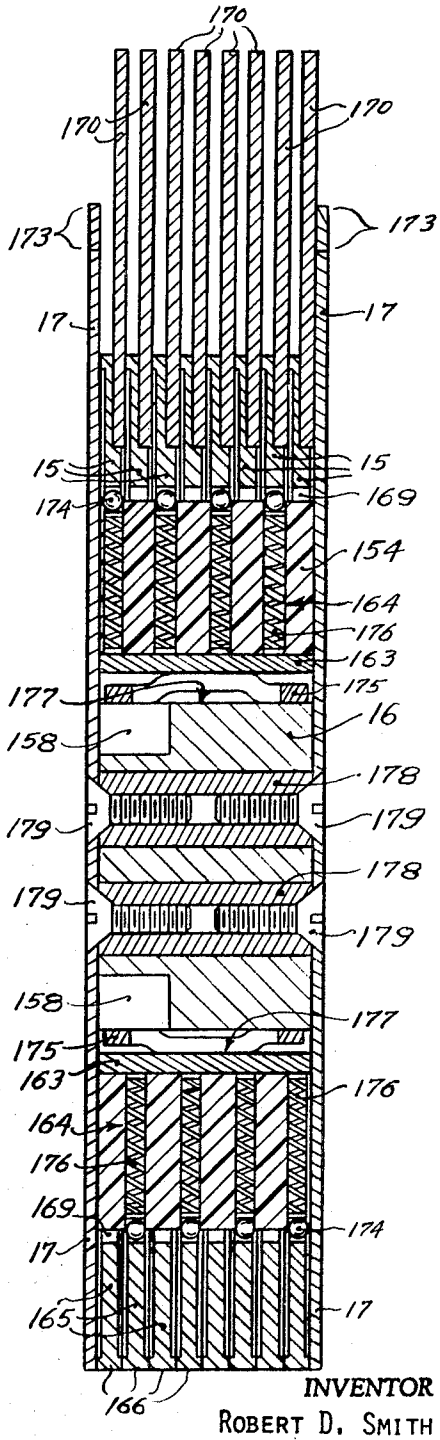


FIG. 21



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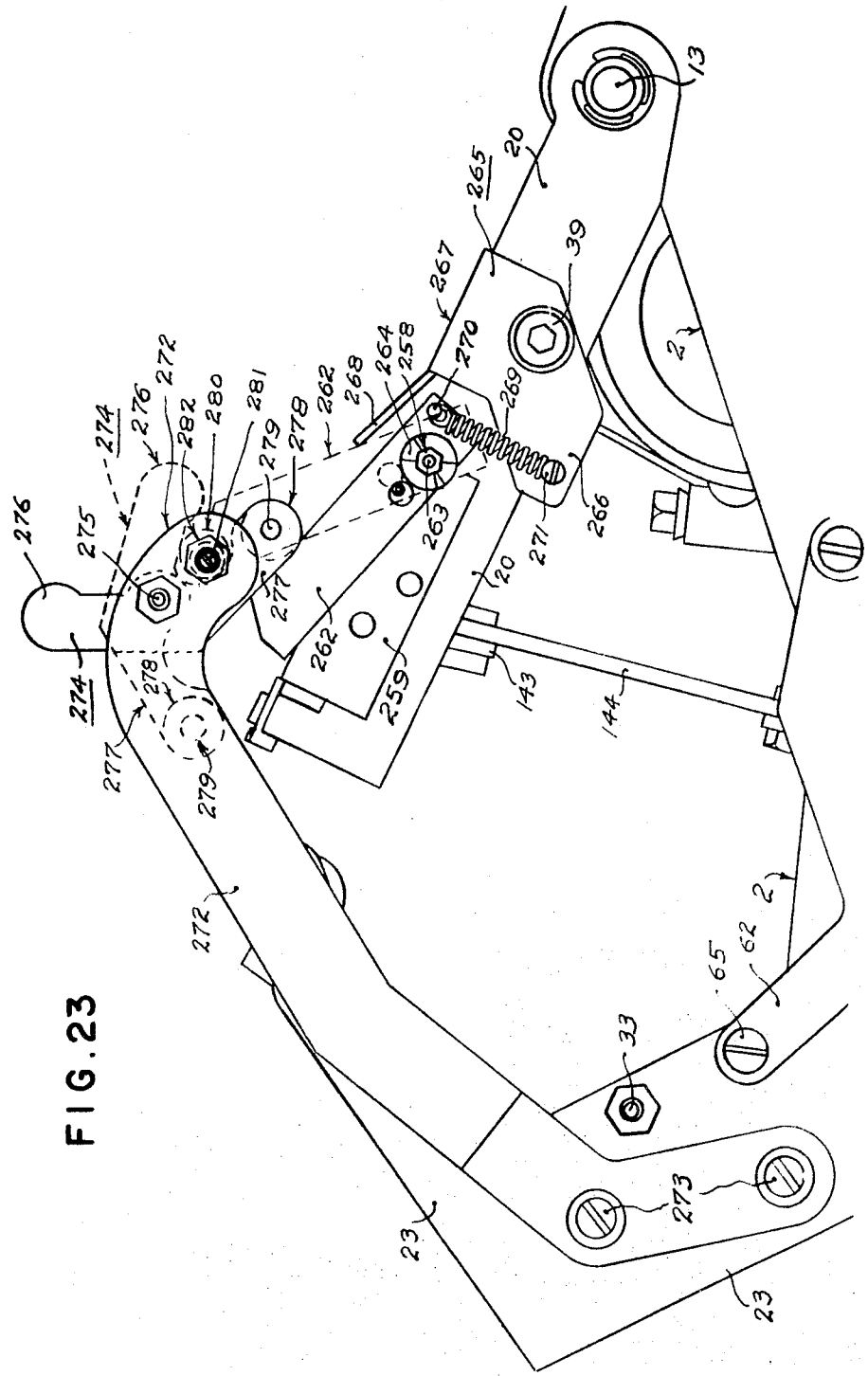
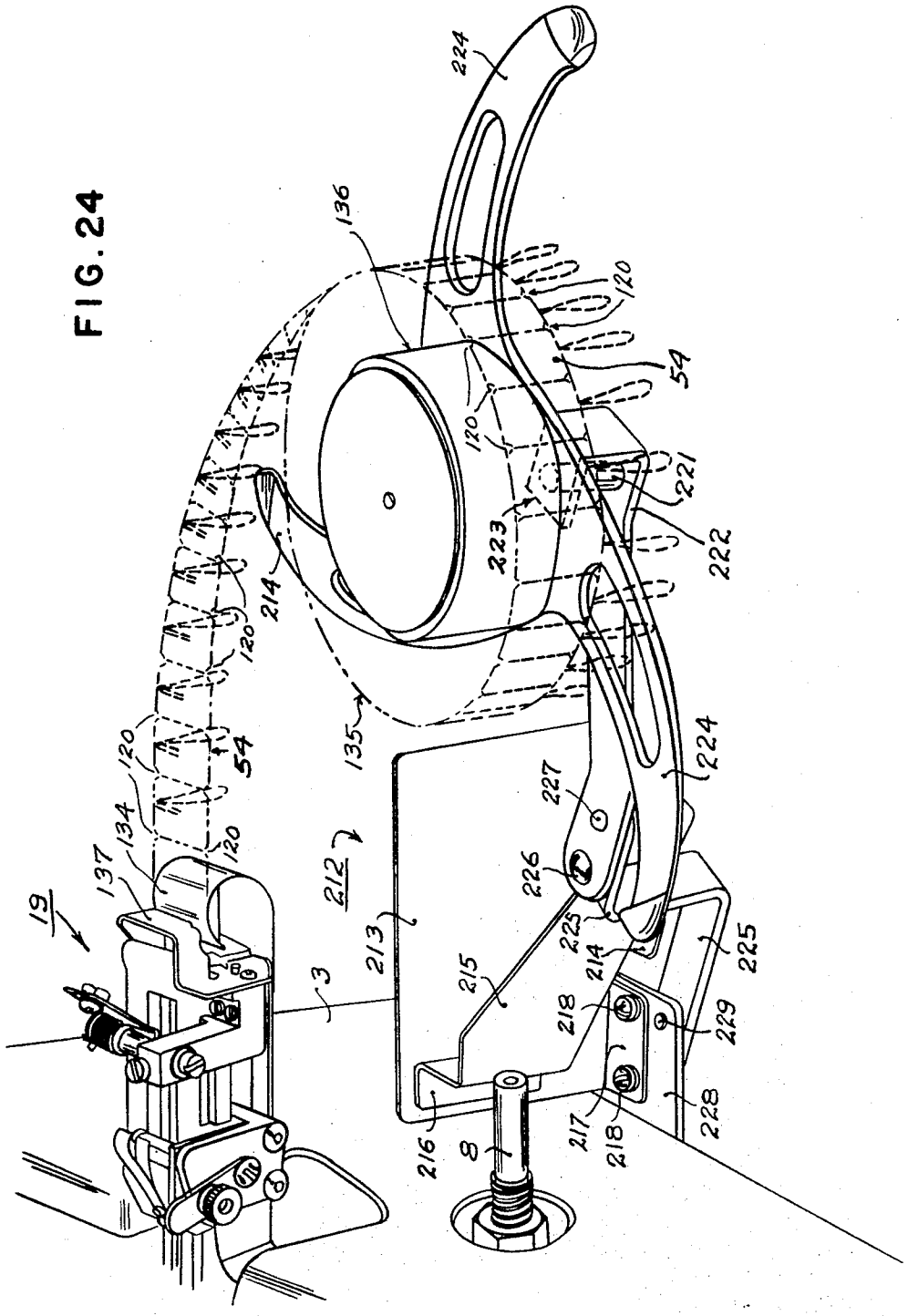


FIG. 23

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FIG. 24



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FIG. 25

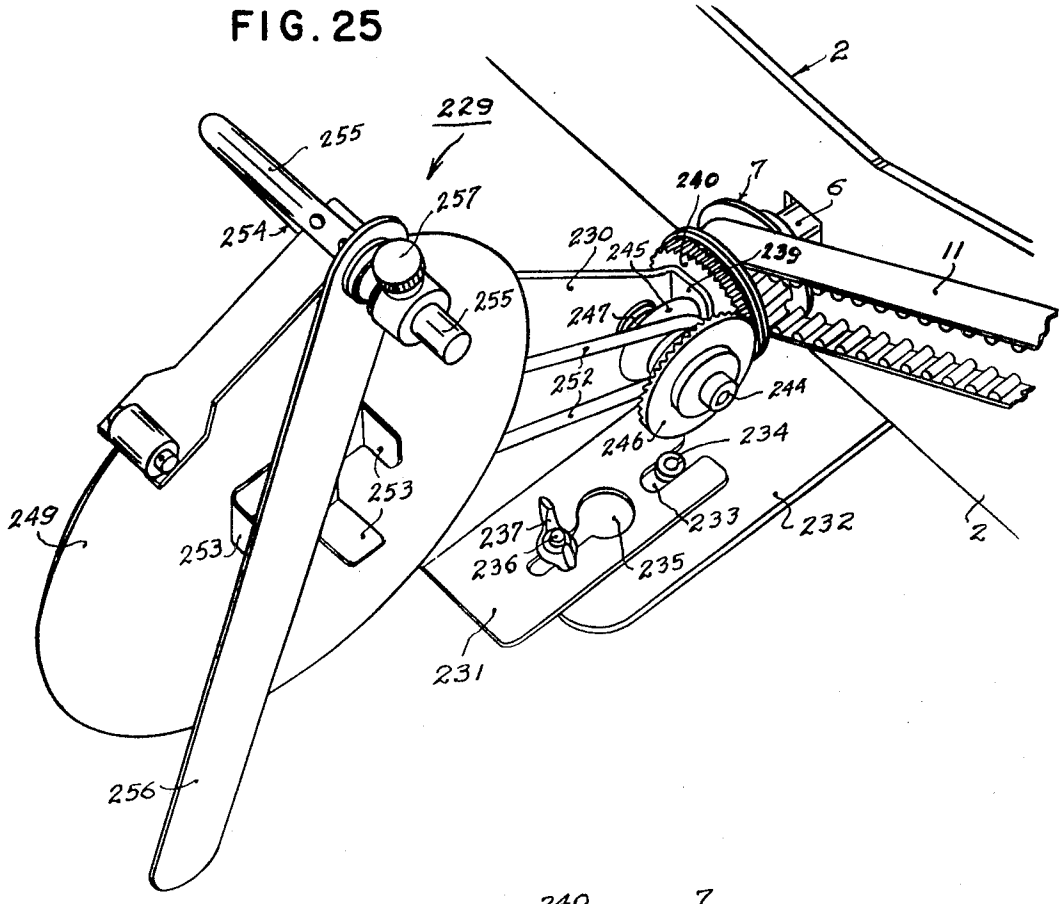
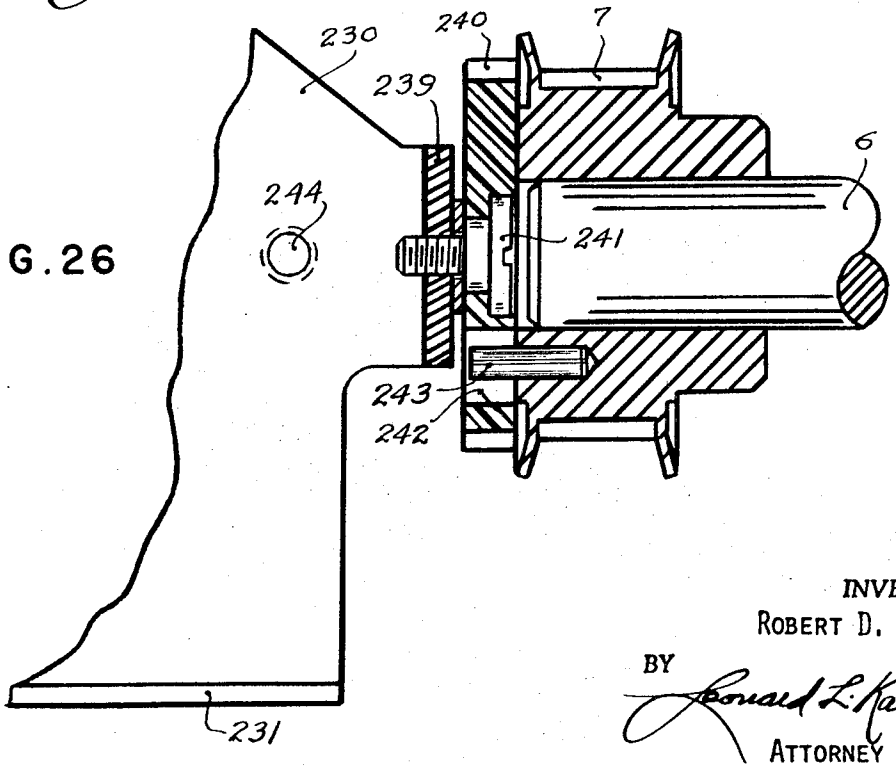


FIG. 26



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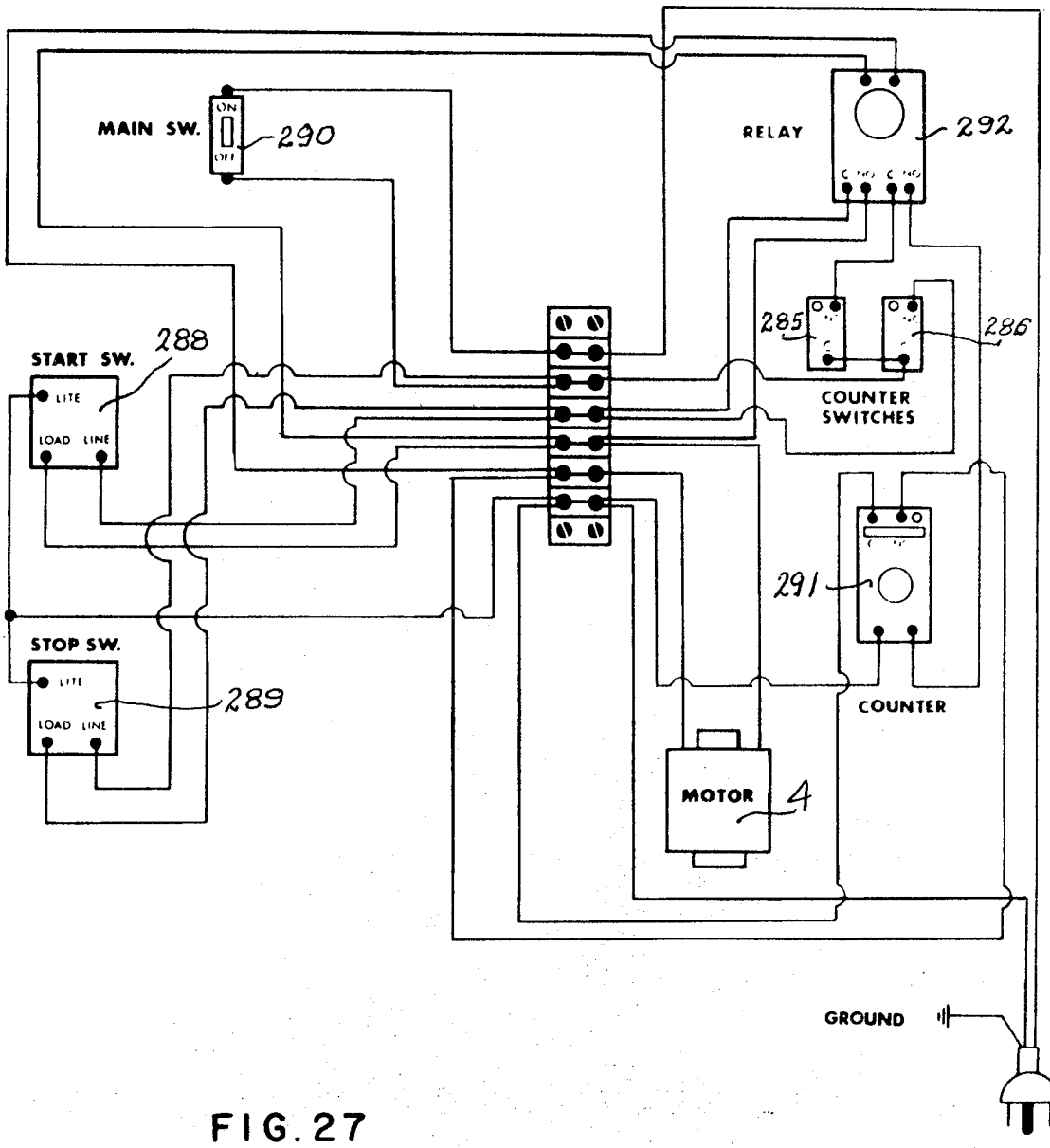


FIG. 27

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TICKET PRINTING AND ISSUING MACHINE WITH ROLLER INKER MEANS

THE FIELD, SUMMARY AND OBJECT OF THE INVENTION

The present invention relates to a machine of the general type disclosed in U.S. Pat. No. 3,331,315, namely, a ticket and label printing and issuing machine for intermittently printing a ticket-length or label-length portion of a tape and for intermittently advancing the tape and issuing imprinted ticket-lengths or label-lengths thereof between successive printings thereof.

The machine of the present invention includes a normally stationary pivotally-mounted type-supporting head arranged stationarily to support type-bearing wheels during successive inkings thereof and during alternating printing impressions therefrom, and arranged to be swung upwardly about its pivot for access to the parts of the machine which normally lie therebeneath and for general maintenance purposes. The type-head includes one or more type-wheel modules. Each module comprises a hub flanked by two side-plates detachably secured thereto and a plurality (as, for instance eight) type-wheels revolvably mounted on each hub, and resilient detent means on the inner peripheries of the type-wheels and along the outer periphery of the hub for separately retaining each wheel in any one of its printing settings. Each wheel has a set of printing type elements along approximately one-half of its periphery and a corresponding and operatively juxtaposed set of readable or indicating type elements along the other half of the periphery thereof and so arranged that by manually turning any type-wheel to any selected indicator-type-element, in relation to a suitable marker or index-element carried by one or both of the side-plates, the corresponding printing-type-element will be positioned in the print-line of the module. The several type-wheel modules are independently pivoted in relation to each other about the pivot common and together constitute the printing-head as a whole, and the modules have their opposite ends or free ends releasably locked in the operative or printing position of the type-head, with separate impression-adjusting means at such end of each type-wheel module for permitting the separate adjustment or variation of the printing impression made by the selected type faces of each module.

The selected printing-type-elements face downwardly in their printing positions, while the corresponding or complementary readable or indicating type elements face upwardly.

An upwardly facing press-platen and tape-feeder (whose frame or body portions are preferably integral with each other) is oscillatably carried by two printing arms which are also preferably integral therewith;—the two printing-arms being pivotally mounted at their front ends. The press-platen and tape-feeder are oscillatable between an upper printing position in operative juxtaposition to the downwardly facing selected printing type elements and a lower retracted position in which the inker has clearance for its type-face-inking and retracting motions. The tape is guided across the upper face of the bed of the tape-feeder and the press-platen and is intermittently advanced therealong a ticket-length or label-length at a time by a tape-feed-finger moved though its tape-advancing motion during the retracting motion of the print-impression and tape-feeder head.

A roll of ticket tape or label tape is rotatably mounted and arranged to have the tape therefrom extend to and through tape guides on the tape feeder and on the press-platen.

An ink pad, in the form of a revolvably mounted roller having a suitable felt covering, is carried by two pivotally mounted inker-arms arranged to oscillate to and fro through an inking motion thereof in which it sweeps across in contact with the faces of the selected printing type elements (in the printing zone) and through a retracting motion thereof by which it is withdrawn to a position clear of the intersecting oscillating path of the press platen print-impression and tape-feeder head.

Means are operatively interposed between the print-impression and tape-feeder head **21** and the inker for generally simultaneously moving them to and fro through their respective intersecting paths of travel, in such timed relation to each other as to cause each to clear the other. While the print-impression and tape-feeder head **21** moves upwardly the inker moves rearwardly, with the aforementioned clearance, and while the print-impression and tape-feeder head **21** moves downwardly the inker is moving forwardly, with the aforementioned clearance. The means effecting such movements comprises two eccentrics affixed to the same shaft, a separately revolvable ring surrounding each eccentric, a printer-oscillating bar above the eccentrics secured to one of the two rings and an inker-oscillating bar below the eccentrics secured to the other of the two rings, and the printer-oscillating bar being directly connected with the aforementioned printer-arms and the inker-oscillating bar being connected to linkages terminating in pivotally mounted inker-oscillating arms.

One of the objects of the present invention is a ticket or label printing and issuing machine so constructed and arranged as to permit the "copy" of the printed matter to be changed quickly and to print the tickets or labels in rapid succession, and either to cut off a ticket or label at a time as it is issued, or, optionally to rewind the printed and issued tape, or simply to pay out the printed tape for subsequent manual tear-off of the individual tickets or labels along perforated or scored lines delineating the tickets or labels;—and a machine of great general versatility.

A further object of the present invention is a machine of this type or character which is of simple and durable construction and reliable in operation and requiring a minimum of maintenance and permitting ease of maintenance when required, and a machine whose construction is relatively inexpensive considering its functions, operation, durability, and reliability and the minimization and ease of maintenance, so as to render it available to the largest number of potential users.

Another object of the present invention is to permit each of the type-modules constituting the type-head to have its print-impression adjusted separately and independently of the print-impression of the other type-modules, for optimum printing quality.

BRIEF DESCRIPTION OF THE FIGURES OF THE DRAWINGS

FIG. **1** represents a right side elevational view of the machine.

FIG. **2** represents a fragmentary cross-sectional view on line **2—2** of FIG. **1**, on a larger scale.

FIG. **3** represents a top view of the machine.

FIG. **4** represents a cross-sectional view on line **4—4** of FIG. **3**.

FIG. **5** represents a left side elevational view of the machine.

FIG. **6** represents a front elevational view of the machine, but with the electrical control box and counter (shown in FIGS. **1**, **3** and **5**) being omitted from FIG. **6**.

FIG. **7** represents a top view of the machine, but with the type-head omitted and with the counter and the electrical control box omitted.

FIG. **8** represents a rear elevational view of the machine, but with the type-head omitted.

FIG. **9** represents a side elevational view of the eccentrics, and showing the shafts oscillated thereby.

FIG. **10** represents a cross-section on line **10—10** of FIG. **9**.

FIG. **11** represents a top view of the print-impression and tape-feeder head.

FIG. **12** represents an end view of same on line **12—12** of FIG. **11**.

FIG. **13** represents a front view of same on line **13—13** of FIG. **11**.

FIG. **14** represents a cross-sectional view on line **14—14** of FIG. **13**.

FIG. **15** represents a bottom view of the print-impression and tape-feed head.

FIG. 1 represents a rear view of same on line 16—16 of FIG. 15.

FIG. 17 represents an end view of same on line 17—17 of FIG. 15.

FIG. 18 is an exploded view of the discharge end of the print-impression head and of the tape guides thereof.

FIG. 19 represents a perspective view of the type-head.

FIG. 20 represents an enlarged side view of the hub of one of the type-modules and of a type-ring thereon, and also showing the detent means for indexing the type wheel or ring.

FIG. 21 represents a cross-sectional view on line 21—21 of FIG. 20.

FIG. 22 represents an exploded view of the detent means indexing the type-wheels.

FIG. 23 represents a fragmentary side elevational view of the left side of the machine but with the tape-pay-out chute omitted and showing the tape-cut-off mechanism.

FIG. 24 represents a fragmentary perspective view of the right side of the machine, showing the two alternative holders for rolls of tape to be fed to the print-impression and tape-feed head (namely, the holders for holding the roll of plain tape and pivotally mounted hub and spokes for mounting a roll of string-tickets to be fed through the tape-feed head.

FIG. 25 represents a perspective view of the tape-rewind on the left side of the machine.

FIG. 26 represents an enlarged vertical cross-sectional view of the drive-coupling of the tape-rewind, taken in the vertical plane in which the axis of the main shaft of the machine lies.

FIG. 27 is a diagram of the electrical components of the machine.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT OF THE INVENTION

In the embodiment shown in the drawings, the machine includes a generally U-shaped frame, preferably formed of sheet steel or sheet aluminum of suitable thickness for the requisite rigidity, and includes the bottom horizontal web or base portion 1, a left vertical flange 2 and a right vertical flange 3 extending upwardly therefrom and parallel with each other. The frame-flanges 2 and 3 are secured to each other through the front spacer-bar 22 and the rear spacer-block 14 by means of headed screws 200, as shown in FIGS. 1 and 3–8.

An electric motor 4, having a gear-reduction assembly 5 at its front end, is mounted on the rear of the base 1. The transverse output-shaft 6 of the gear-reduction assembly 5 extends through a suitable opening in the vertical frame-flange 2 and has a flanged sprocket-wheel 7 secured to its outer end (FIGS. 6 and 7).

A main-shaft 8 is journalled in suitable anti-friction bearings 9 mounted in the frame-flanges 2 and 3 and has flanged sprocket-wheel 10 affixed to its left end in alignment with the sprocket-wheel 7. A cleated timer-belt 11 extends over the sprocket-wheels 7 and 10, between the flanges thereof, with its cleats intermeshing with the teeth of the sprocket-wheels, thereby to drive the main-shaft 8 without slippage.

A type-head, designated generally by the numeral 12, nests between the frame-flanges 1 and 2 and has its front end pivotally mounted to the frame-flanges 1 and 2, about a pivot 13 which passes through aligned pivot-holes in the front ends of the eight side-plates 17 mentioned below. The rear end of the type-head 12 rests on the anchorage or supporting block 14 which is disposed between the frame-flanges 1 and 2 and secured thereto;—the rear end of the type-head 12 being releasably secured to the block 14 in the manner hereinafter described. (FIGS. 1, 3–6 and 19–21)

The type-head 12 is composed of four type-modules generally designated as A, B, C and D, respectively. Each type-module comprises eight independently revolvable type-wheels 15 mounted on a common hub 16;—the axes of the four hubs being parallel with each other but spaced apart from each other a distance equal to the spacings between the centers of the print-lines. Each hub 16 is supported between a pair of side-plates 17;—the eight side-plates and the four hubs and the type-wheels thereon constituting the type-head 12 pivoted in the manner mentioned above. The details of the hubs and the detent means thereof and the details of the type-wheels and the impression-adjusting means of each type module will be described more fully hereinafter. (FIGS. 19–22)

A tape-supporting press-platen 18 and an aligned tape-feeder-bed 19 are carried by a pair of oscillatable printer-arms 20. The press-platen 18 and the tape-feeder-bed 19 and the printer-arms 20 are preferably all formed integral with each other and are preferably formed of aluminum or an alloy casting to minimize their weight and thereby to reduce the inertial effect thereof for their rapid to and from oscillations. For convenience of reference, the integral unit comprised of the press-platen 18 of the tape-feeder-bed 19 and the printer-arms 20 is hereinafter collectively referred to as the print-impression and feeder-head 21. (FIGS. 11–17)

The print-impression and tape-feeder head 21 is pivotally mounted upon the pivot 13 extending through and pivotally supported by the two frame-flanges 1 and 2 and is free to be oscillated up and down between its upper print-impression position and its lower retracted position.

A pair of inker-arms 23 are pivotally mounted to the frame-flanges 1 and 2 about pivots 24, so as to be free to oscillate forwardly through an inking motion and rearwardly through a retracting motion. Inker-carrying or inker pressure levers 25 are pivoted to the inker-arms 23, by pivots 26. The rear ends of the inker pressure levers 25 have a spring-anchorage rod 27 therebetween and secured thereto, while the front ends thereof have vertical pivot-receiving slots 28 therein for snugly receiving the flattened ends 29 of the inker-shaft 30 on which the inker-bearing bushing 31 is revolvably mounted. A cylindrical inking-pad 32 (formed of axially compressed felt washers or the like) surrounds and is firmly mounted on the bearing bushing 31. A lower spring-anchorage rod 33 extends between the inker-arms 23 and is secured thereto. One or more helical tension springs 34 have their opposite ends anchored to the anchorage-rods 27 and 33, thereby urging the revolvably-mounted cylindrical inking-pad 32 upwardly. Inker-retainer arms 35, having in-turned upper shaft-retaining flanges 36 in operative juxtaposition to the flattened ends 29 of the inker-shaft 30, are secured to the inker-arms 23 by means of the pivot-screws 26 and the retainer-securing screws 37.

By manually deflecting the inker-pressure levers 25 in a counter-clockwise direction as viewed from the right side of the machine (FIG. 1), the front ends of the levers 25 are deflected downwardly, away from and clear of the in-turned flanges 36 of the roller-retainers 35, and in this condition the shaft 30 and the inking-roller 32 thereon may be removed from the levers 25.

A printer-arm oscillating bar 38 extends between and is secured to two printer-arms 20, by screws 39, at a suitable distance rearwardly of the pivot 13 of said arms. A flanged bushing 40 is oscillatably disposed on the outer cylindrical surface of the bar 38, for receiving the connector-strap 50.

A pair of identical driven eccentric members 42 are mounted on the main shaft 8 of the machine, and are pinned or otherwise affixed to the shaft by set screws or other suitable means. The eccentric members 42 have facing bearing-entering-and-supporting hubs 43. The axis of the shaft-receiving holes 44 of the eccentric members 42 are spaced approximately three-eighths inch from the centers of the hubs 43. Two identical (or similar) ball-bearings (or other suitable radial type anti-friction bearings) 45 and 46 are mounted between the two eccentric members 42, with the hub 43 of one eccentric member snugly fitting into the bore of the inner race of the bearing 45 and with the hub 43 of the other eccentric member snugly fitting into the bore of the inner race of the bearing 46. A spacer 47 is disposed between the facing annular planar end-surfaces of the two inner races. (FIGS. 6, 7, 9 and 10)

A pair of headed screws 48 extend through diametrically opposite holes in the two hubs 43 of the eccentric members

42, and a nut 49 threaded onto the free ends thereof secures the two eccentric members 42 and the inner races of the bearings 45 and 46 in firmly fixed assembled relation to each other, with the outer races of the bearings being free independently to revolve about the inner races thereof on the anti-friction elements therebetween. (FIGS. 9 and 10)

A steel connecting-band or strap 50 extends around the outer race 52 of the bearing 45 and around the flanged bushing 40 on the printer-oscillating bar 38, with the flanges of the bushing 40 neatly flanking the sides of the outer race, thereby firmly clamping the bushing 40 to the outer race 52 of the bearing 45. By this means, the print-impression and tape-feeder head 21 is oscillated up and down (about its pivot 13) with each revolution of the main shaft 8.

Thus, the printer-arm-oscillating bar 38 moves between upper and lower positions which are approximately three-fourths inch apart, while print-impression and tape-feeder head 21 moves up and down between the upper and lower positions which are apart from each other a distance equal to three-fourths -inch multiplied by the ratio of the distance from the press platen 18 to the pivot 13 and the distance between the bar 38 and the pivot 13.

In its upper position, the press-platen 18 presses the ticket-tape 54 resting thereon against the faces of the selected printing type-elements 167 of one or more or all of the printing modules A, B, C and D, while in its lower positions the printing-platen 18 is below and clear of the travel-path of the inker element 32 so as to permit the inking roller 32 to sweep across in inking engagement with such type faces and to permit the retraction of the inker element 32.

A pair of similar "L" shaped rocker-arms 55 are pivotally mounted to the opposite vertical frame-flanges 2 and 3 by pivot members 56. Between the ends of the forwardly extending arms 57 of the rocker-arms 55, an inker-operator bar 58 is pivotally secured by means of suitable "C" type and "E" type retainer-rings 59 mounted in the ring-receiving grooves in the ends of the bar 58;—the bar 58 being free to rotate in the bar-receiving holes in the arms 57 of the rocker arms 55.

A flanged bearing bushing 41, similar to the bearing bushing 40 described above, is oscillatably mounted on the inker-operator bar 58, and a steel connector-band or strap 51 (similar to the strap 50) surrounds the outer race 53 of the bearing 46 and the bushing 41, and clamps the two firmly to each other in a manner similar to the clamping of the bushing 40 to the outer race 52 of bearing 45.

The overlapping ends of the straps 50 and 51 are secured to each other and the straps are tightened by a worm-screw revolvably mounted on one end of the strap and worm-engaged slots in the other end of the strap, in the manner illustrated, for instance, in U.S. Pat. Nos. 2,386,629 and 2,395,273.

By this means, forward extensions 57 of the rocker-arms 55 are oscillated up and down with each revolution of the main-shaft 8, out of phase with the oscillations of the printer arms 20.

To clear the upper and lower positions of the inker-operating bar 58, ¾-inch clearance holes 60 are provided in the frame-flanges 2 and 3.

To the generally upright extensions 61 of the rocker-arms 55, the front ends of the links 62 and 63 are pivotally secured by pivot screws 64. (FIGS. 1 and 5)

The rear ends of said links 62 and 63 are pivotally secured to the pair of like inker-arms 23 by pivot-screws 65 (the inker-arms 23 being pivoted to the frame-flanges 2 and 3, at their lower ends, by means of the pivot-screws 24).

Through the eccentrically mounted outer race 53 of the bearing 46 and the inker-operating bar 58 strapped thereto (through the bushing 41) and through the rocker-arms 55 and links 62 and 63 and inker-arms 23, the linking pad or roller 32 is oscillated forwardly and rearwardly (and is so moved across the faces of the selected printing type-elements of the several type-modules) during the inking cycle of the machine, while the print-impression and tape-feeder head 21 is oscillated upwardly and downwardly through its printing and retracting cycle while the inker-arms 23 and the inking element 32 carried thereby are retracted rearwardly.

Referring to FIGS. 13 to 18, the press-platen 18 has a raised tape-receiving terminal portion 66 at its right-hand end, and has a raised tape-pay-out terminal portion 67 at its left-hand end, whose upper surfaces are about one-eighth inch above the main upper surface of the platen 18 on which the ⅛ thick impression-pad 70 is supported, and the surfaces 66 and 67 are hence at the same level as that at which the impression-pad 70 supports the tape to be imprinted. The raised terminal portions 66 and 67 have inclined portions 68 and 69 facing the direction from which the tape approaches them.

Between the raised label-receiving and pay-out portions 66 and 67, the impression-pad 70 of rubber or other suitable resilient material (of suitable firmness) is nested and held in place by two split-tubular dowel-like members 71 mounted in holes in the platen 18 and extending upwardly into corresponding holes in the impression-pad 70 in areas other than the areas in which the printing takes place.

A ⅛-inch high raised rib 72 is provided on the tape-feeder-mounting member 19. The upper surface of the rib 72 is at the same level of the upper surfaces of the raised tape-receiving and pay-out ends 66 and 67 of the platen 18;—and rib 72 rising above the upper surface of the rest of the member 19. A ½-inch wide and ⅛-inch high steel plate 73 is secured to the tape-feed-mounting member 19 by a pair of flat-headed and counter-sunk screws 74, whereby the upper surface of the plate 73 is at the same level as the upper flat surface of the rib 72, and together therewith form a tape-bed upon which the tape rests and on which the tape is intermittently advanced one ticket-length at a time, towards the tape-receiving terminal portion 66 and the pay-out portion 67 of the printer-platen 18.

The plate 73 is spaced from the rib 72 so as to provide a channel 75 therebetween for one of the two tape-engaging prongs 119 of the feeder-finger 77.

Posts 78 and 79 are formed integrally with the platen 18 and extend upwardly therefrom, about five-sixteenths inch rearwardly of the raised terminal portions 66 and 67 thereof, respectively. The posts 78 and 79 have like channels 80 therein, at a right angle to the travel-path of the tape, and the raised terminal portions 66 and 67 of the platen 18 have short registering notches 81 therein, in alignment with the channels 80. Similar adjustable rear tape-edge-guides 82 are slidably nested in the channels 80 and notches 81, and bridge the 5/16-inch gaps or channels 83 therebetween, and are adjustably secured in said channels 80 and notches 81, in any desired adjusted position corresponding to the width of the tape (within the range of adjustability provided), by means of the lock-screws 84 which pass through adjustment slots 85 in the tape-edge-guides 82 and are threaded into tapped holes in the posts 78 and 79.

In front of the tape-receiving end 66 and pay-out end 67 of the platen 18, a pair of fixed tape-edge guides 86 are removably mounted (but without adjustability) by being nested in recesses 87 in the rear ends of the printer-arms 20 and held in place by the screws 88.

The rear tape-edge-guides 82 and the front tape-edge-guides 86 have raised end portions or projections 89 at their inner ends, facing each other and facing the edges of the tape to be guided thereby. The raised projection 89 serve to interlock the tape-edge-guides 82 and 86 with rear and front tape-hold-downs 90 and 91 and to prevent the edges of the tape from getting between the tape-edge-guides and the tape-hold-downs. (FIG. 18)

The tape-edge-guides 82 and 86 are formed of any suitable form-retaining plastic material which will minimize friction with the edges of the tape, for instance, nylon or Delrin or the like.

The rear tape-hold-down 90 (of a strip of spring-steel or the like), overlies the two rear guides 82 and has rearwardly extending anchorage tabs 92 having slots 93 therein registering

with the adjustment-slots **85** in the rear tape-edge-guides **82**, and has slots **94** which are telescoped over the raised projections **89** at the inner ends of the guides **82** so as to interlock the guides **82** and the hold-down **90** with each other.

The lock-screws **84** pass through the slots **93** in the hold-down **90** and through the slots **85** in the guides **82**, so as to lock both in their simultaneously adjusted positions.

The similar front tape-hold-down strip **91** overlies the two front tape-edge-guides **86** and is secured thereto by the screws **88** and is interlocked therewith by the slots **95** telescoped over the projections **89** thereof.

To the under surface of the front tape-hold-down **91**, a generally "L" cross-sectioned supplemental tape-edge-guide **96** is secured (by rivets or other means) with the upwardly extending short leg of the "L" cross-section thereof nested in a longitudinal slot **97** formed in the tape-hold-down strip or plate **91**. The inwardly and rearwardly facing vertical surface of the upstanding leg of this metal tape-edge-guide **96** is in alignment with the inwardly and rearwardly facing ends of the front tape-edge guide **86**.

The inner marginal zones of the tape-hold-downs **90** and **91** overlap the impression-pad **70** just sufficiently to keep the tape **54** thereon flat against the pad **70**;—such overlap being clear of the printing areas, The thin spring-steel tape-hold-downs **90** and **91** are spaced above the impression-pad **70** just sufficiently to permit the free passage of the tape along the impression-pad during the intermittent advancement of the tape.

An anti-buckling tape-hold-down member **98** is provided over the tape-bed-plate **73** on the right-hand tape-feed extension **19** of the print-impression and tape-feeder head **21**, so as to hold the label or ticket tape flat against the tape-feed-bed constituted by the upper surface of the rib **72** and the upper surface of the steel plate **73**.

The tape-hold-down **98** is formed of a thin strip of spring steel (or the like) and has an integral anchorage-arm **99** at a right angle to its right-hand end, which is secured by screws to an upwardly facing horizontal surface of the forward extension **100** at the right-hand end of the tape-feeder-base member **19**;—such surface being about three thirty-seconds -inch above the tape-feed-bed (**72** and **78**). The left-hand portion of the leaf-spring **98** inclines downwardly (in a longitudinal direction) from its anchorage-arm **99** and the tape-hold-down **98** resiliently bears against the upper tape-supporting surface of the plate **73** and against the upper tape-supporting surface of the tape-receiving terminal portion **66** of the press-platen **18**;—thereby resiliently to hold down the tape against such tape-supporting surfaces.

Two aligned downwardly-open slider-mounting channels **101** of rectangular cross-section, are provided in the underside of the tape-feeder-base **19**, and in these channels a rectangular cross-sectioned tape-feed-slider **103** is slidably mounted. A slider-retaining steel plate **104** is secured across the downwardly-open side of the channels **101** by means of screws **105**, to retain the slider **103** therein.

A generally L-shaped tape-feed-finger support **106** is secured to the front vertical face of the slider **103** by means of screws **107**. The vertical portion of the L-shaped support **106** extends upwardly to a point suitably above the level of the tape-bed on the tape-feed base-member **19**.

The upper portion **108** of the vertical part of the support **106** is thinner than the lower portion thereof, to provide an upwardly facing horizontal shoulder **109** across the vertical leg of the L-shaped support **106**. A horizontal slot **110** extends through the upper portion **108**. A horizontally adjustable vertically-disposed pivot-plate **111** rests on the shoulder **109** and fixedly carries the horizontal feed-finger pivot **112** extending rearwardly thereof, whose outer threaded end extends through the slot **110** and through a generally vertical slot **113** in the feed-adjusting lever **114** whose lower end is pivoted to the support **106** by the pivot-screw **115**. A knurled nut **116**, threaded onto the outer threaded end of the pivot **112**, serves to lock the pivot-plate **111** (and the pivot **112** fixedly carried thereby) in any desired adjustment. The pivot-plate **111** also carries a fixed spring-abutment pin **117** having a head at its rear end. The tape-feed finger **77** (made of nylon, Delrin or the like) is pivotally mounted on the pivot **112**, and has two spaced-apart prongs **119**;—one at the front end thereof and the other at the rear end thereof, flanking the outer edges of the tape-bed-plate **73** and of the tape-bed-rib **72** and extending below the upper tape-supporting surfaces thereof, so as to enter the feed-notches **120** along the edges or edge-zones of the tape **54**. A leaf-spring **121** is secured to the upper surface of the tape-feed-finger **77** (by means of screws or other suitable means) and has its free end resiliently pressing downwardly against the spring-abutment pin **117**, thereby resiliently to urge the feed-finger **77** downwardly in the direction of the tape **54**, so that when the finger **118** is moved leftward by the slider **103**, the prongs **119** thereof will engage in the notches **120** of the tape **54** and will advance the tape one ticket-length in the leftward direction towards the press-platen **18**, and so that when the finger **77** is retracted in a rightward direction its prongs **119** will be disengaged from the notches **120**.

Portions of the edge of the finger **77** inwardly adjacent to the prongs **119** thereof rest on the tape when the prongs are engaged in the notches thereof. Intermediate such portions, the edge of the finger **77** is cut away or relieved so as to clear the tape-hold-down **98**.

A tape-check-supporting post **122** extends upwardly from the front of the front face of the right-hand tape-receiving end of the tape-feeder-base **19** and is integral therewith. A horizontal tape-check-pivot **123** has its front end journaled in a horizontal hole in the post **122**, and has screw-driver-slot across its outer end, whereby it can be turned to any desired position for adjusting the force of the spring **124**;—in which position it is locked by the set-screw **125**. A blade-holder-plate **126** having pivot-receiving flanges **127** by which it is pivotally mounted on the pivot **123**. The blade-holder-plate **126** has a spring-steel tape-check-blade **128** adjustably secured thereto by a screw **129** extending through a longitudinal adjustment slot **130** in the upper end of the plate **126** and through a hole in the blade **128** and by the nut **131** on the screw. The helical torsion spring **124** surrounds the rear portion of the pivot **123** and has one end thereof pressing against the pivoted blade-holder-plate **126** to urge the tape-check-blade **128** thereof downwardly against the tape **54** therebeneath, and has the other end thereof anchored to the rear end of the pivot **123** by being anchored in the hole in one of the ears of the "C" type or "E" type retainer-ring **133** nested in a ring-receiving groove in the rear end of the pivot **123**.

The lower end of the tape-check-blade is bifurcated, and the two spaced-apart lower ends thereof are in alignment with the tape-bed-plate **73**, and ride on the upper surface of the tape **54** passing therebeneath, and prevent any retrogressive motion of the tape **54** in a right-hand direction when it is not being moved in the left-hand direction by the tape-feed-finger **77**.

A tape-slack or shock-absorbing spring **134**, formed of a thin sheet of spring-steel, has its lower horizontal anchorage portion fastened to the underside of the slider-retaining-plate **104** (by means of the two screws **105** which hold the plate **104** in place), and the top of its upper resilient loop is approximately in or slightly above the plane of the tape-bed constituted by the rib **72** and plate **73**, so that said plane is approximately tangent to the top of said spring-loop when the tape **54** is not moving over the tape-feeder-base **19** and platen **18**. The spring-loop **134** yields, by closing up to a greater or lesser extent, during the commencement of each (intermittent) feeding motion of the tape **54** before the inertia of the stationary tape-supply roll **135** has been overcome by the pulling of the tape by the tape-feed-finger **77**. In this manner the shock of the sudden advancement of the tape by the small prongs **119** (of the finger **77**) engaged in the notches **120** of the tape is absorbed by the spring-loop **134**.

A tape-guide **137** is adjustably secured to the right-hand vertical face of the portion **100** of the tape-feeder-base **19**, by

means of a headed lock-screw and a pin passing through a horizontal adjustment slot in the lower vertical anchorage portion **138** thereof (FIG. **12**). The guide **137** has a downwardly-facing horizontal edge **139** (across the tape-path) generally in or slightly above the plane of the tape-bed surfaces **72** and **73** and spaced a short distance from the right-hand ends thereof, so as to keep the tape in alignment with such tape-bed surfaces as the tape approaches same. The guide **137** also has downwardly extending guide-flanges **140** for guiding the edges of the tape.

A pivotal connector member **141**, having a horizontal pivot hole through the upper portion thereof, is pivotally connected to the left-hand end of the tape-feed slider **103** by a headed pivot-screw **142** having its threaded end threaded into a tapped hole in the end of the slider **103**. The pivotal connector member **141** has a downwardly extending pivotal flange **143**, to which the left-hand end of the tape-feeder-link **144** is pivotally connected by the pivot-screw **145**. To right-hand end of the tape-feeder-link **144**, the pivotal flange **148** of a connector **147** is pivotally connected by the pivot-screw **149**. The pivotal connector member **147** is a duplicate of the pivotal connector member **141**, but is turned upside-down in relation thereto so that its main body portion (having the horizontal pivot-hole therethrough) is at the bottom and its pivot flange **148** extends upwardly from its main body portion. The main body portion of the pivotal connector **147** is pivoted adjacent the outer surface of the frame-flange **3** upon a horizontal pivot **150** fixedly mounted to the frame-flange **3**. By means of the tape-feed link **144** and the pivotal-connectors **141** and **147**, the tape-feed slider **103** and hence the tape-feed-finger **77** are moved leftward through their tape-advancing stroke while the print-impression and tape-feeder head **21** is moving downwardly through its retracting oscillatory stroke, and the slider **103** and finger **77** are moved rightward through their retracting stroke while the print-impression and tape-feeder head **21** is moving upward through its oscillatory printing stroke.

Of the four type-modules A, B, C and D comprising the type-head **12**, module A is the one on the right side of the machine, and module B is immediately adjacent to and to the left of module A, and module C is immediately adjacent to and to the left of module B, and module D is immediately adjacent to and to the left of module C. The four modules (A, B, C and D) together constitute the type-head **12** (see FIGS. **1, 2, 3** and **6** and **19** to **22**). Each module (A, B, C and D) includes a cylindrical hub **16**, generally having a 2-½-inch diameter, and eight type wheels **15** revolvably mounted thereon and two side-plates **17** secured to the hub **16**. The axial dimension of the hub **16** is equal to the combined axial of the type-rims **166** of the eight type-wheels **15**, plus working-clearance between the rims and between the outermost of them and the side-plates **17**. The distance between the outer surfaces of the two side-plates **17** of a module is equal to the length of the tape-feed and to the length of the ticket or label.

Each hub **16** has two opposite channels **153** extending therethrough, parallel to its axis and spaced 180° from each other, for receiving the detent-housings **154**. The radially outermost portions **155** of the channels **153** extend to the outer periphery of the hub, and each channel **153** includes a pair of opposite inwardly-enlarged or undercut portions **156** and a retainer-receiving and lock-plate-receiving portion **157**. On one side of the hub **16**, an access recess **158** is provided, through which the end of a small screw-driver or like implement may be inserted at an angle into the slot of the locking-plate **175** for removing the locking-plate when it is desired to remove the detent housing **154** from the hub or remove tension from the springs **176**.

Into each channel **153** a detent-housing **154** is inserted by sliding it into place from either end of the channel. The detent-housing **154** includes an outer portion **159** which extends into the outer channel portion **155** with its outer surface generally flush with the cylindrical surface of the hub **16**, and has opposite wing-like side-portions **160** of a cross-section generally the same as the cross-section of the side channel portions **156** into which they fit. The wing-like side-portions **160** of the detent-housing are interrupted in the middle by a gap **161** into which the upturned tabs **162** of the metal spring-retainer plates **163** fit. The spring-retainer-plate **163** extends across the innermost flat surface of the detent-housing **154** and spans the four radial detent and spring-receiving holes **164** thereof.

The eight type-wheels **15** are revolvably mounted on the outer cylindrical surface of the hub **16**. The type-wheels **15** are punched and coined out of sheet-steel or other suitable metal. The main body portion **165** of the wheel **15** is annulus shaped, and has an axial width or thickness of approximately one-sixteen inch, and has a radial width of approximately fifteen thirty-seconds inch. Around its outer periphery, the annulus **165** is widened axially to form an integral type-rim **166** having an axial width approximately 0.1 inch and a radial thickness approximately 0.02 inch. Two duplicate sets of raised integral type-elements **167** and **168** are formed on the two halves of the type-rim **166**, spaced apart from each other at 12° intervals. Fourteen printing type-elements **167** are along the generally lower half of the rim **166**, and corresponding and operatively juxtaposed readable or indicator type-elements **168** are along the generally upper half of the rim **166**; — with two blank spaces between the two sets. Thus, each printing type-element **167** has an identical reading or indicator type element **168** opposite thereto at 180° (or other suitable degrees) therefrom. The indicator type-elements **168** are the normal readable characters, while the opposite printing type-elements **167** are the reverse or mirror images thereof for producing readable printing. Moreover, the indicator type-elements or characters **168** are preferably bolder and/or larger than the printing type-elements **167** so as to make them more easily readable and so as to standardize on the reading type-elements or characters on the type-wheel **15**, regardless of the fact that some wheels may have different size or style printing type-faces than other wheels.

Along the inner periphery of the main annulus-like body **165** of the type-wheel **15**, generally V-shaped notches **169** are provided at 12° spacings and in radial or other operative alignment with or juxtaposition to each of the printing type-elements **167** and each of the indicator-type elements **168** and the centers of the two blank spaces.

A 0.05-inch thick radial type-selecting handle or arm **170**, having its outermost end reduced to enter the socket of any suitable wheel-setting tool, is fixedly mounted to the annulus **165** of each type-wheel **15**, by milling out a shallow recess in the side of the annulus to approximately one half of its thickness, and nesting the handle **170** nested therein, and spot-welding the nested portion of the handle to the recessed portion of the annulus **165**.

The handle **170** is mounted in the indicator half of the circumference of the type-wheel **15**, preferably diametrally (or otherwise operatively) opposite the blank space on the printing-half of the periphery thereof, so that when the eight handles **170** of a module are positioned to the indicator-line represented by the indicator-indexing tabs **173** carried by the side-plates **17**, the blank portion of the printing-half of the type-rim **166** is presented to the press-platen **18** (in the print-line of the module), so that no printing will result in such setting.

To print the desired "copy" in the print-line of the module, each type-wheel **15** is turned so that the selected indicator type-element **168** is in registration with the indexing-tabs **173** of the module.

The spring-urged detent-balls **174** entering the corresponding V-notch **169** serve accurately to line up the corresponding printing type-element **167** in the print-line of the module and to keep it there until the type-wheel is again re-set.

A steel detent-ball **174** is disposed in the outer end of each of the four radial through-holes **164** in each of the two detent-housings **154**, and a helical compression spring **176** is disposed behind the ball, with its inner end support by the spring-

retainer plate **163** at the inner end of the housing **154**; — the springs **176** being thereby maintained under suitable compression. A bowed and slotted locking-plate **175** is wedgingly inserted between the spring-retainer plate **163** and the innermost flat wall **177** of the channel **153**, to firmly press the spring-retainer plate **163** against the bottom surface of the detent-housing **154**.

The axes of the four holes **164**, and hence the centers of the detent-balls **174** are spaced from each other 0.2 inch, but with the axis at one of the outermost or end holes being approximately 0.05 inch from the end of the detent-housing while the axis at the other outermost or end hole is approximately 0.15 inch from the opposite end of the detent-housing **154**. The two detent-housings **154** in each hub **16** are identical, but are reversed as to their hole positions, so that the axes of the four holes **164** in one detent-housing lie in radial planes staggered with respect to the radial planes of the axes of the holes **164** in the opposite detent-housing, whereby the two sets of four holes each are in alternate radial planes which are 0.1 inch apart.

The detent-balls **174** carried by one detent-housing **154** co-act with the notches **169** in one half of the type-wheel, while the detent-balls **174** in the other detent-housing **154** co-act with the notches **169** in the other half of the type-wheel.

Each hub **16** has four module-assembly holes, designated as **180A**, **180B**, **180C** and **180D**, extending therethrough, with their axes parallel to the axis of the hub, as shown in FIG. **20**. Into two opposite of these holes (differently selected for differently locating the print-line of each module in relation to the print-lines of the other modules) internally-threaded tubular side-plate-connecting bushings **178** are mounted. The length of the bushings **178** is equal to the axial width of the hub **16**. Flat-headed screws **179** extend through the two side-plates **17** of the module (with their heads countersunk in the plates) and are threaded into the opposite ends of the bushings **178**, thereby firmly maintaining the hub **16** and eight type-wheels **15** thereon and the two side-plates **17** of the module in assembled relation to each other.

In the embodiment shown in the drawings, the module A on the right-hand side of the machine is arranged to print the top line of the ticket or label, while each succeeding module (B, C and D) is arranged to print the next lower line therebeneath. This arrangement of the staggering of the modules is arbitrary and may be changed so that any module may be optionally selected to print any one of the selected printed lines. However, the following explanation of the selection of two of the holes **180** for the four different modules (A, B, C and D) is based on the assumption that the module at the right-hand side of the machine is to imprint the top line and the succeeding modules to the left thereof are to imprint the successively lower lines therebeneath.

In the hub **16** of module A, the two side-plate-connecting bushings **178** are inserted into holes **180A** and **180D**, with **180A** at the top and **180D** at the bottom, thereby presenting the selected printing type-elements **167** at the bottoms of the eight type-wheels **15** to the uppermost print-line of the ticket or label.

In the hub **16** of the module B, the two side-plate-connecting bushings **178** are mounted in holes **180B** and **180C**, with **180B** at the top and **180C** at the bottom, thereby presenting the selected printing type-elements **167** of module B in the next lower print-line of the ticket or label.

In the hub **16** of module C the two side-plate-connecting bushings **178** are mounted in holes **180C** and **180B**, with **180C** at the top and **180B** at the bottom, thereby presenting the selected printing type-elements **167** of module C in operative alignment with the next lower (or third) print-line of the ticket or label.

In the hub **16** of module D, the two side-plate-connecting bushings **178** are mounted in holes **180D** and **180A**, with **180D** at the top and **180A** at the bottom, thereby presenting the selected printing type-elements **167** of module D in the bottommost print-line of the ticket or label.

The print-lines on the ticket or label are so spaced vertically from each other, that the center of each printed line is three-sixteenths inch from the center of the next adjacent printed line.

The centers of the holes **180A** and **180C** are three-eighths inch apart and the centers of the holes **180B** and **180D** are likewise three-eighths inch apart. The centers of the holes **180A** and **180D** are 1.75 inches apart from each other, and the centers of the holes **180B** and **180C** are likewise 1.75 inches apart from each other, but the plane of the axes of the holes **180A** and **180D** are spaced 0.281 inch from the axis of the hub, while the plane of the axes of the holes **180B** and **180C** is spaced 0.093 inch from the opposite side of the axis of the hub.

A spacer and bearing bushing **181**, having a bore corresponding to the diameter of the pivot **13**, is mounted between the front ends of the two side-plates **17** of each type-module, as shown in FIGS. **3** and **19**. The outer diameters of the ends **182** of the bushings **181** are reduced for an axial length equal to the thickness of the side-plate **17** and extend into correspondingly diametered holes **183** in the front ends of the side-plates **17**. The pivot **13** extends through the four bushings **181** and through spacer-washers **190** between the outermost side-plates **17** and the vertical frame members **2** and **3**, as shown in FIG. **3**. The outer ends of the pivot **13** are mounted in corresponding holes in the side frame-plates **2** and **3** and are retained by split retainer-rings **13R** in ring-receiving grooves in the outer ends of the pivot, adjacent the printer arms **20** pivoted thereon. By this means, not only are the outer ends of the two side-plates **17** of each type-module mounted in appropriately spaced relation to each other, but the front end of the type-head **12** as a whole is pivotally mounted, so that it may be swung about the pivot **13**, from its operative position (shown in FIGS. **1** to **6**) to an open position, so as to provide access to the under side of the type-head **12** and to the interior of the machine therebeneath.

Additional spacers **184**, **185** and **186** are provided between the two side-plates **17** of each type-module, as shown in FIG. **19**, to which spacers the side-plates are firmly secured by pairs of flat-headed screws **187**, **188** and **189** threaded into the respective spacers, with their heads counter-sunk in the side-plates **17**, so that the two adjacent side-plates of two adjacent type-modules may bear against each other.

Between the spacers **185** and **186** of each type-module, an impression-adjustment bushing **191** is pivotally mounted by having its two reduced-diametered ends **192** journalled in corresponding journal holes **193** in the two side-plates of the type-module, as indicated particularly in FIGS. **19** and **3**;—the axial dimension of the large-diametered body-portion of the bushing **191**, being generally equal to the lengths of the bushings **185** and **186**. Each of the four bushings **191** has a diametral hole **194** therethrough at a right angle to its axis. An impression-adjusting screw **195** extends through the hole **194** of each bushing **191**, and has its end threaded into a corresponding tapped aligned hole in the impression-adjusting block **196** beneath and extending across the rear ends of the four type-modules and interconnecting the same, as indicated in FIGS. **1**, **3**, **4** and **5**.

Resilient washers **197** of rubber or the like or other suitable resiliently compressible means are interposed between each impression-adjustment bushing **191** and the impression-adjustment block **196**, as indicated in FIG. **4**, so that by tightening the head of the screw **195** against its bushing **191**, to varying degrees, the washers **197** will be compressed to a greater or lesser extent, thereby taking up the slack between the block **19** and the rear ends of the type-modules, in all print-impression adjustments of the screw **195**. The impression-adjusting block **196** rests on the shoulder **198** of the supporting block **14**. The supporting block **14** is, in turn, fixedly mounted between the upper rear portions of the two side-plates **2** and **3** of the frame by means of the dowel pins **199** and the screws **200** and also serves firmly to hold the two vertical frame plates **2** and **3** in spaced relation to each other.

A bracket **201**, having two right-angular flanges, has its lower flange **202** firmly secured to the underside of the supporting block **14** by means of screws **203**. Co-axial holes **204**, **205** and **207** extend through the supporting-block **14** and through the right-angular flange **206** of the bracket **201** and through the impression-adjustment block **196**, respectively, at a right angle to each as indicated in FIGS. **1**, **3**, **4** and **7**. A spring-urged bolt or locking-pin **208** is slideably mounted in the holes **204** and **205**, so that when its front end is extended into the hole **207** of the impression-adjustment block **196**, then the latter and the rear end of type-head **12** are firmly held and locked against the supporting surface **198** of the supporting-block **14**. A helical compression spring **209** surrounds the pin **208**, with its front end bearing against a C-type or E-type retainer-ring **210** mounted in a ring-receiving groove in the ping **208**, and with its rear end bearing against a flange **206** of the bracket **201** or against a washer **211** mounted thereagainst.

To swing the type-head **12** into its raised or open position indicated in FIG. **5**, pin **208** is retracted until its front end in clear of the block **196** and the type-head **12** is then swung open.

Dowel pins **299** are press-fitted into each of two holes **300** in the supporting block **14**, beneath and in axial alignment with the lower threadless terminal portions of the two outermost screw-receiving holes **301** in the impression-adjustment block **196**. The upper free ends of the dowel pins **299** telescope into such threadless terminal portions of the holes **301** with a close sliding fit, thereby maintaining the rear end of the type-head **12** in proper alignment when the type-head is in its operative position, as shown in FIGS. **3** and **4**.

As shown in FIGS. **3**, **6**, **7**, **8** and **24**, a tape-roll holder or label-case designated generally by the numeral **212** is provided on the right side of the machine, beneath and in operative alignment with the tape-feed portion **19**. The label-case **212** includes the upright plate **213**, having two lower forwardly-extending roll-supports **214** integral therewith, and the front roll-retainer **215** parallel to the plate **213** and secured thereto by means of the bracket **216**. The roll of ticket tape or label tape is placed between the parallel plates **213** and **215**, with its outer periphery resting on the lateral bottom-supports **214**. The tape from the so supported roll is extended over the tape-unwinder spring-loop **134** and beneath the edge **139** of the tape-guide **137**, and is extended onto and through the tape-feed portion **19** and onto and through the press-platen **18**, with its edge-zones beneath the guides **90** and **91**. The plate **213** of the label-case **212** has a horizontal flange **217** at the bottom thereof, and screws **218** secure the flange **217** to the supporting-plate **228** which extends under the base **1** of the machine and is secured thereto by screws.

When it is desired to feed a tape of string tickets through the machine, the revolvably mounted tape-roll support designated generally by the numeral **219** (FIG. **24**) is used. The roll-support **219** includes the hub ticket-reel **136** carried by a pivot **221** extending downwardly therefrom the journalled in the ticket-reel-arm **222** and the parallel journal-flange **223** extending therefrom. The reel includes flat spokes **224** which support the roll of string tickets. The arm **222** is secured to the ticket-reel-support **225** by means of the screw **226** and the dowel pin **227**. The support **225** is in turn secured to the mounting-plate **228** by means of one of the screws **218** and the screw **229**. The roll of string tickets is so placed over the hub **220** and on the spokes **224** that the edge of the tape from which the string-loops extend faces downwardly and rests on the spokes **224**. The string-loops of such ticket-tape pass behind the tape-feeder portion **19** and behind the press-platen **18**.

A readily attachable and detachable tape-rewind is provided on the left side of the machine, as indicated in FIGS. **6**, **25** and **26**. The tape-rewind includes the vertical rewind-bracket **230** disposed at a right angle to the frame-plate **2** of the machine and having a horizontal base-flange **231** resting on the supporting plate **232** whose inner end extends beneath and is secured to the bottom frame member **1** of the machine. The base-flange **231** is provided with an open-ended slot **233** at its inner end, for embracing the fixed pin **234** carried by the plate **232**, and is also provided with a key-hole type opening **235** through which the screw **236** extends;—the lower end of the screw **236** being anchored in the supporting plate **232**. A wing-nut **237** is provided on the screw **236** for tightening the base-flange **231** against the supporting plate **232**.

The rewind-bracket **230** includes a forwardly extending vertical flange **239** at a right angle thereto and parallel to the frame-plate **2** of the machine, to which flange **239** the spur-gear **240** is pivotally secured by means of the shoulder pivot-screw **241** as indicated particularly in FIG. **26**. The gear **240** is provided with a hole **242** parallel to and at a suitable distance from its axis. A driving-pin **243**, carried by the sprocket-wheel **7**, extends into the hole **242** of the spur-gear **240** when the tape-rewind is operatively mounted on the machine as indicated in FIGS. **6**, **25** and **26**. A pivot **244** is secured to the main vertical plate **230** of the tape-rewind, at a right angle thereto and in the plane in which the axis of the pivot **241** lies. The O-ring type pulley **245** and the face-gear **246** meshing with the spur-gear **240** are each independently revolvable on the pivot **244**. A rubber washer or other suitable friction disc (not shown) is interposed between the front face of the pulley **245** and the rear face of the face-gear **246** and forms a frictional slip-drive therebetween. The spring **247** resiliently urges the pulley **245** into driving engagement with the washer and hence with the gear **246**.

An O-ring type pulley **248**, having the rewind-disc **249** affixed thereto, is revolvably mounted upon a pivot **250** secured to the lateral extension **251** of the tape-rewind bracket **230**. A suitable O-ring type rubber belt **252** (or the like) runs over the pulley **245** and the pulley **248**, thereby to drive the rewind-disc **249** and the core **253** affixed thereto. A retainer-support rod **254** is secured to the main vertical plate **230** of the tape-rewind (as indicated in FIG. **6**) and has a horizontal forwardly extending pivot portion **255**, to which the tape-retainer **256** is adjustably secured by the thumb nut **257**.

When tickets or labels issuing from the left side of the machine are not to be cut into individual labels or tickets, then the tape-rewind shown in FIGS. **25** and **26** can be attached to the machine as shown in FIG. **6**, whereas if the tape is to be cut into individual tickets or labels or allowed to simply feed out in a continuous strip as the tape issues from the machine then the tape-rewind is detached from the machine.

The tape-cutter shown in FIGS. **5** and **23** includes a stationary blade **259** secured to the left printer-arm **20** by means of screws **260** which also hold the out-feed ramp or delivery chute **261** in place, in operative alignment with the pay-out end of the press-platen **18**. A movable blade or knife **262** is pivotally mounted on the pivot **263** with an axially resilient washer **264** beneath the nut **258**, so as resiliently to hold its cutting edge in operative engagement with the cutting edge of the stationary blade **259**. The bracket **265** has its vertical flange **266** secured to the side of the left printer-arm **20** by the headed screw **39** which secures the printer-oscillating bar **38** to the two printer-arms **20**. A lateral extension **267** of the bracket **265** overlies the arm **20** (FIGS. **7**, **5** and **23**) and has a rearwardly extending knife-stop **268** in alignment with the movable blade **262**, and serves to limit its upward swinging under the influence of the spring **269** which is operatively interposed between the spring-anchorage **270** on the movable knife **262** and the spring-anchorage **271** carried by the flange **266**.

A knife-drive arm **272** is affixed to the left inker-arm **23** by means of screws **273** as indicated in FIGS. **5** and **23**. A throw-out lever **274** is pivoted to the knife-drive arm **272**, about the pivot **275**, and has a handle-arm **276** and a knife-operating arm **277**. To the end of the knife-operating-arm a roller **278** is pivotally secured by the pivot **279**;—the roller **278** being in operative alignment with the movable knife **262**. An adjustment-eccentric **280** is carried by a threaded stud **281** in operative alignment with a knife-actuating arm **277** of the throw-

outer lever **274**. The eccentric-carrying stud **281** extends through a suitable clearance hole in the end of the knife-drive arm **272** and has a slot in its free end so that it may be turned by a screw-driver or the like, and has a jam-nut **282** threaded onto its free end, by means of which nut the adjustment-eccentric **280** may be locked in any adjusted position. When the throw-out lever **274** is swung into its cutting position shown in solid lines in FIG. **23**, then the knife-operating arm **277** thereof bears against the periphery of the adjustment-eccentric **280**, whereby said eccentric determines the operating position of the roller **278** (carried by the arm **277**) and hence determines how far down the movable knife **262** will be moved on its cutting stroke about its pivot **263**. To de-activate the cutter, the throw-out lever **274** is swung into its inoperative position shown in dotted lines in FIG. **23** and shown in solid lines in FIG. **5**.

The micro-switches **285** and **286** are mounted side-by-side on the vertical frame-flange **2** as indicated in FIGS. **6** and **7**, for operating the counter **291**;—with the operating-arms of said switches facing and in operative alignment with the switch-eccentric **287** mounted on the main shaft **8** and affixed thereto in proper phase relation by suitable set-screws (FIGS. **7** and **10**).

A biplanar electrical panel, comprising a front panel **294** and a top panel **295**, bridges across and overlaps the edges of the front of the two vertical frame-flanges **1** and **2**, and is secured in place by the top screw **296** threaded into a tapped hole in the front frame-spacer **22** and by the bottom screw **297** threaded into the angle bracket **298** secured to the base plate **1**, as shown in FIGS. **1**, **2** and **3**. A button-operated starting-switch **288** and stop-switch **289** are mounted in the top panel **295**, an on-off main switch **290** and relay **292** are mounted on the front panel **294** on the right side of the machine, and an electro-magnetic counter **291** is mounted in the top panel **295** on the left side of the machine.

FIG. **27** shows the electrical interconnection between the eccentric-operated micro-switches **285** and **286** and the switches, the counter and the relay mounted on the panels **294** and **295**.

The counter **291** may be any suitable electro-magnetically actuated counter, as, for instance, Model 3—Y—11654 of the Durant Manufacturing Company. The counter **291** is one which stops the machine (through the relay **292**) when the count thereon has reached its pre-determined setting and will prevent the machine from starting when all the wheels thereof all read zero. Thus, by setting the wheels **293** of the counter **291** to the number of tickets desired, the turning the main-switch **290** to its "on" position and pressing the start button **288**, the machine will operate until it has issued the number of tickets or labels for which the counter **291** has been set.

Having shown and described an embodiment of the invention, I claim the following.

1. A ticket and label printing and issuing machine, including a type-head having a plurality of side-by-side type-wheel modules, each including a plurality of co-axial type-wheels, the axes of the type-wheel modules being parallel but spaced apart from one another so as to place their selected printing type elements into separate spaced-apart print-lines, each type-wheel having a set of printing type-elements along approximately one-half of its periphery and a corresponding set of type-indicator elements along approximately the other half of its periphery facing upwardly, means for holding said type-head stationarily in its operative position throughout the operation of the machine and capable of releasing said type-head from its operative position for access and maintenance, a print-impression and tape-feed head in operative juxtaposition to said type-head and arranged to be oscillated between a printing position and a retracted position, said print-impression and tape-feed head including a tape-supporting press-platen and a tape-feed-bed and a tape-feeder, a pivotally mounted inker arranged to be oscillated in a path transverse to the oscillating path of the print-impression and tape-feed head, between an inking position and a retracted position thereof, eccentric means for oscillating the print-impression and tape-feed head between its printing and retracted positions and for oscillating the inker between its inking and retracted positions in timed relation to each other so that the inker is moved through its inking and retracting motions while the print-impression and tape-feed head is retracted from the path of the inker and so that the print-impression and tape-feed head is moved through its print-impression and retracting motions while the inker is retracted from its path.

2. A ticket and label printing and issuing machine, including a pivotally mounted type-head having a plurality of type-wheel modules whose axes are parallel but spaced apart from one another so as to place their downwardly facing selected printing type elements into separate spaced-apart print-lines, each type-wheel having a set of printing type elements along approximately one-half of its periphery and a corresponding set of type-indicator elements along approximately the other half of its periphery facing upwardly, each type module having a separate impression-adjusting means, the type-head being releasably locked in its operative position and being swingable to an open access position when unlocked, a print-impression and tape-feed head carried on pivoted printer-arms beneath and in operative juxtaposition to said type-head and arranged to be oscillated up and down between an upper printing position and a lower retracted position, said print-impression and tape-feed head including a tape-supporting press-platen and a tape-feed-bed and a tape-feeder, a pivotally mounted inker arranged to be oscillated in a path transverse to the oscillating path of the print-impression and tape-feed head, between an inking position and a retracted position thereof, eccentric means for oscillating the print-impression and tape-feed head between its upper and lower positions and for oscillating the inker between its inking and retracted positions in timed relation to each other so that the inker is moved through its inking and retracting motions while the print-impression and tape-feed head is retracted and so that the latter is moved through its print-impression and retracting motions while the inker is retracted.

3. A ticket and label printing and issuing machine, including a type-head having a plurality of side-by-side type-elements each including a plurality of optionally selectable type-faces adapted to be selectively placed into a printing-line, means for holding said type-head stationarily in its operative position throughout the operation of the machine and capable of releasing said type-head from its operative position for access and maintenance, a print-impression and tape-feed head in operative juxtaposition to said type-head and including a tape-supporting press-platen and a tape-feed-bed and a tape-feeder, said print-impression and tape-feed head being arranged to be oscillated between a printing position and a retracted position, a pair of pivotally-mounted inker-arms, roller-carrying ink-pressure-levers pivoted to said inker-arms, an inker-roller revolvably carried by the ends of said levers, resilient means yieldably urging said levers about their pivots so as to yieldably urge said inker-roller in the direction of the selected type-faces of said type-head, said inker-arms being arranged to be oscillated in a path transverse to the oscillating path of the print-impression and tape-feed head, between an inking position and a retracted position thereof, eccentric means for oscillating the print-impression and tape-feed head between its printing and retracted positions and for oscillating the inker-arms between their inking and retracted positions in timed relation to each other so that the inker-roller is moved through its inking and retracting motions while the print-impression and tape-feed head is retracted from the path of the inker-roller and so that the said print-impression and tape-feed head is moved through its print-impression and retracting motions while the inker is retracted from its path;—said inking-roller sweeping across the selected type-faces during the inking motion of the inker-arms and being yieldably pressed against said type faces.

4. A ticket and label printing and issuing machine according to claim **2**, in which the type-head and the print-impression

and tape-feed head are pivoted about the same axis of pivotation.

5. A ticket and label printing and issuing machine according to claim 1, in which the inker comprises a pair of pivotally-mounted oscillatable inker-arms, roller-carrying levers pivoted to said inker-arms, an inker-roller revolvably carried by the ends of said levers, and resilient means yieldably urging said levers about their pivots so as yieldably to urge said inker-roller in the direction of said type-head.

6. A ticket and label printing and issuing machine, including a downwardly facing type-head having a plurality of side-by-side type-element modules, each module including a plurality of side-by-side type-elements having printing type-faces thereon and having corresponding oppositely-facing and operatively juxtaposed readable characters thereon, said modules being parallel with each other and being successively offset in relation to each other by a distance equal to the spacing between the lines to be printed, so as to place the selected printing type-faces of the successive modules into separate successive spaced-apart print-lines, means for locking said type-head stationarily in its operative position and capable of being unlocked so as to permit the type-head to be moved into an open and inoperative access-and-maintenance position, a print-impression and tape-feed head in operative juxtaposition to said type-head and arranged to be moved to-and-fro between a printing position and a retracted position, said print-impression and tape-feed head including a tape-supporting press-platen and a tape-feed-bed and a tape-feeder, separate impression-adjusting means associated with each module, said separate impression-adjusting means being arranged to retain their respective adjustments notwithstanding the unlocking and re-locking of said type-head-locking means, an inker arranged to be moved to and fro in a path transverse to the to-and-fro path of the print-impression and tape-feed head, between an inking position and a retracted position thereof, means for moving the print-impression and tape-feed head to and fro between its printing and retracted positions and for moving the inker to and fro between its inking and retracted positions in timed relation to each other so that the inker is moved through its inking and retracting motions while the print-impression and tape-feed head is retracted from the path of the inker and so that the print-impression and tape-feed head is moved through its print-impression and retracting motions while the inker is retracted from its path.

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