Sept. 16, 1947. F. Q. RAST 2,427,418

ARTICLE-CONTROLLED GRIPPING, PRINTING, AND SEVERING MACHINE

Filed Aug. 28, 1942 5 Sheets-Sheet 1

FIG. 1.

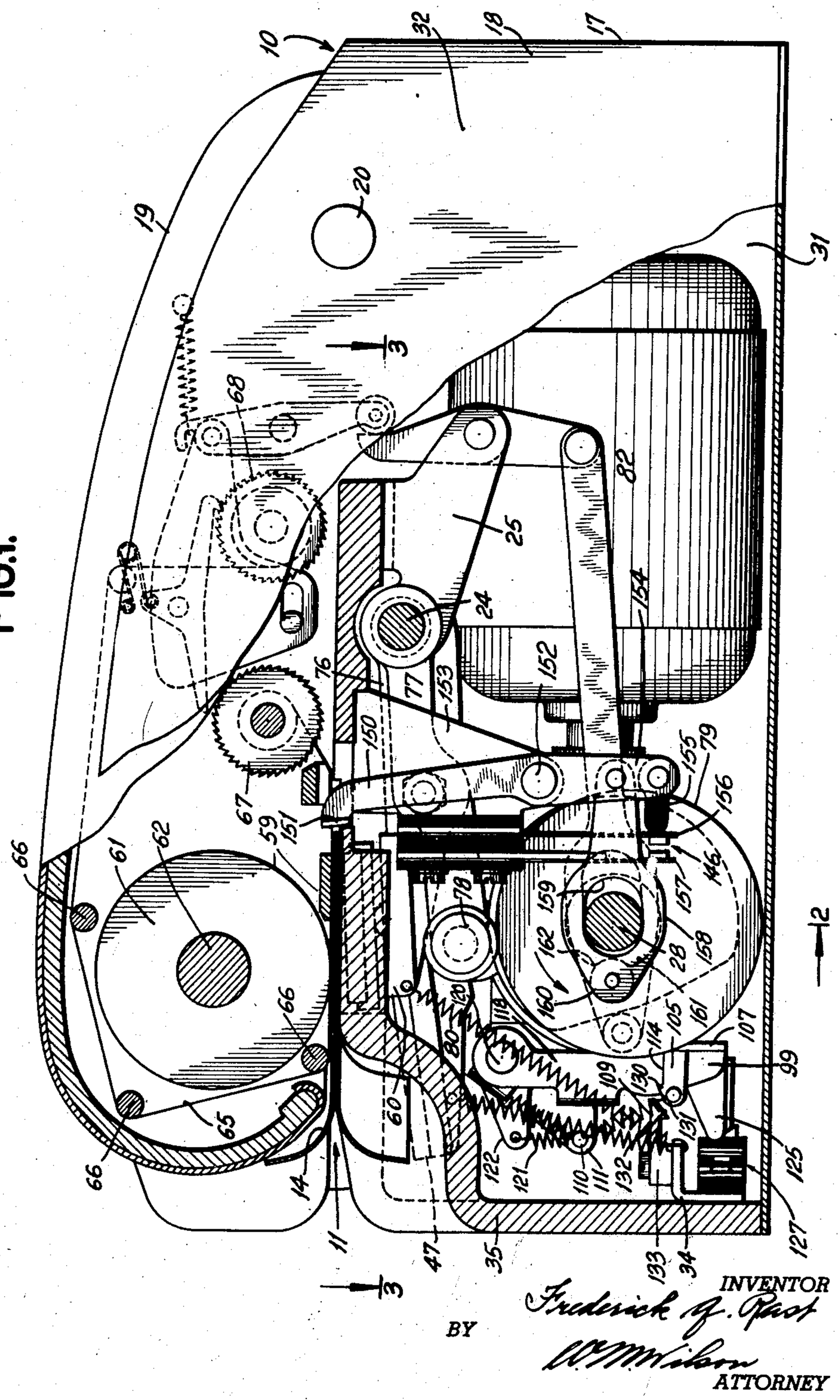

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FIG. 2.

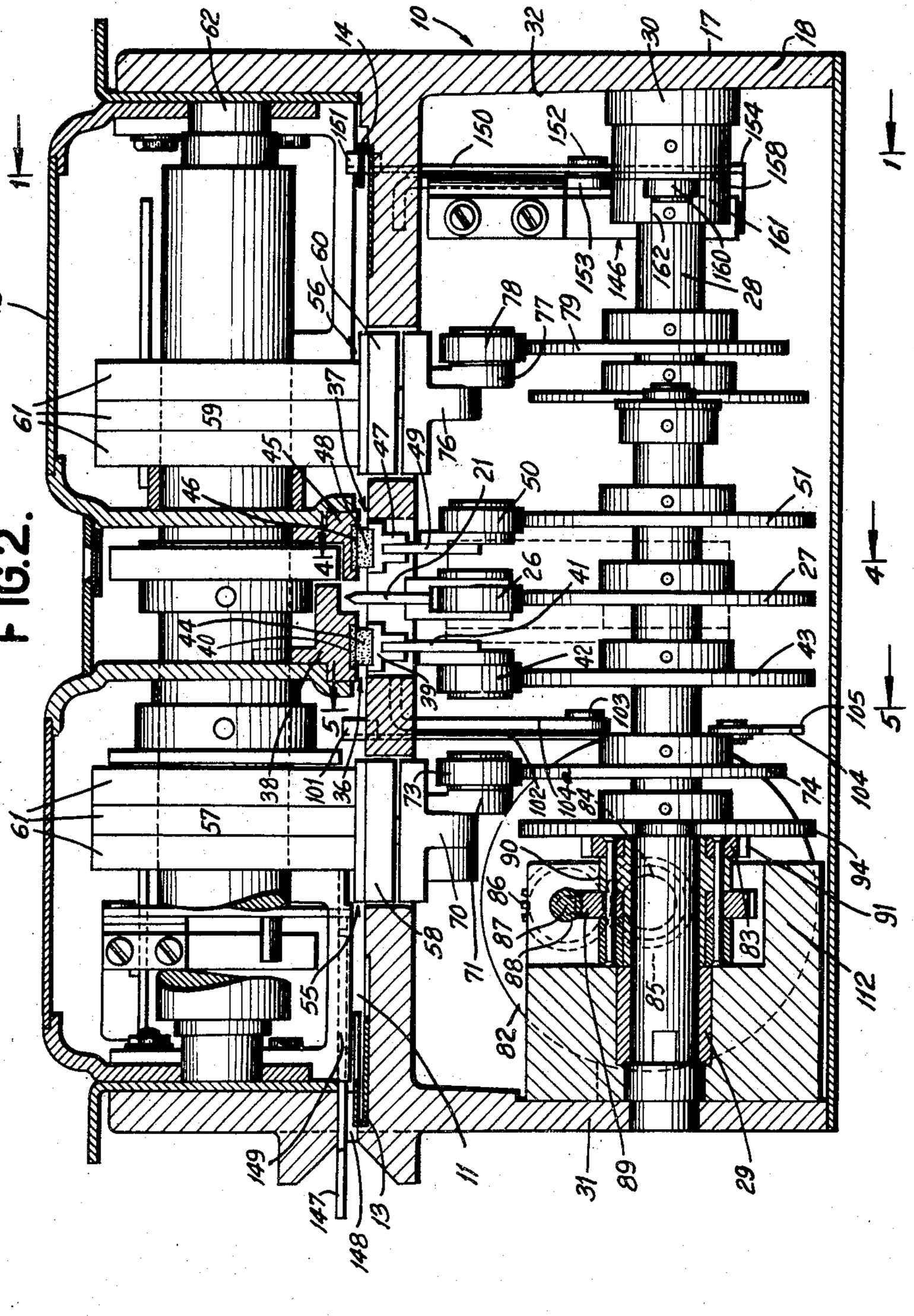

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FIG.3.

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ARTICLE-CONTROLLED GRIPPING, PRINTING, AND SEVERING MACHINE

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FIG.4.

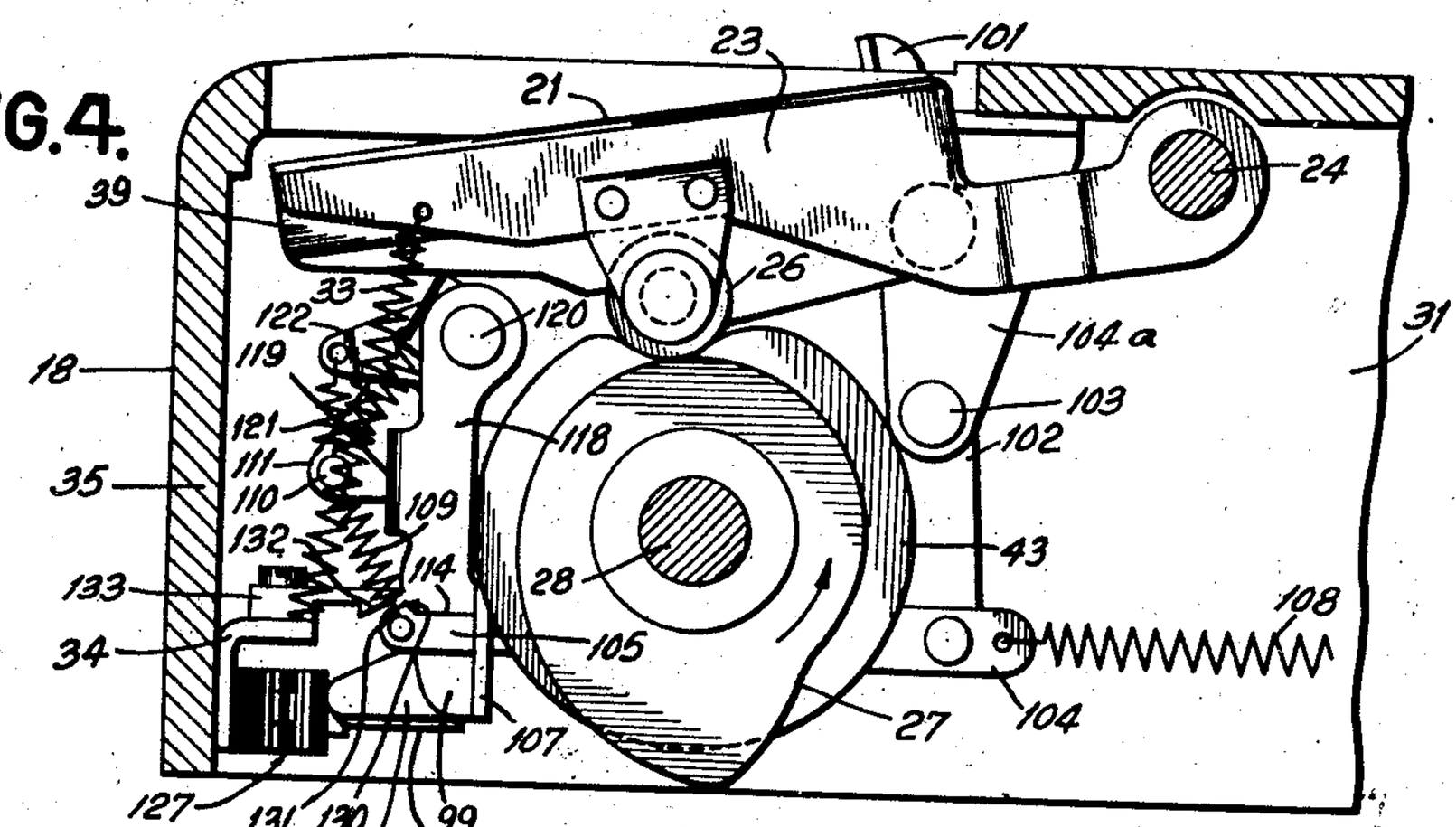


FIG.9.

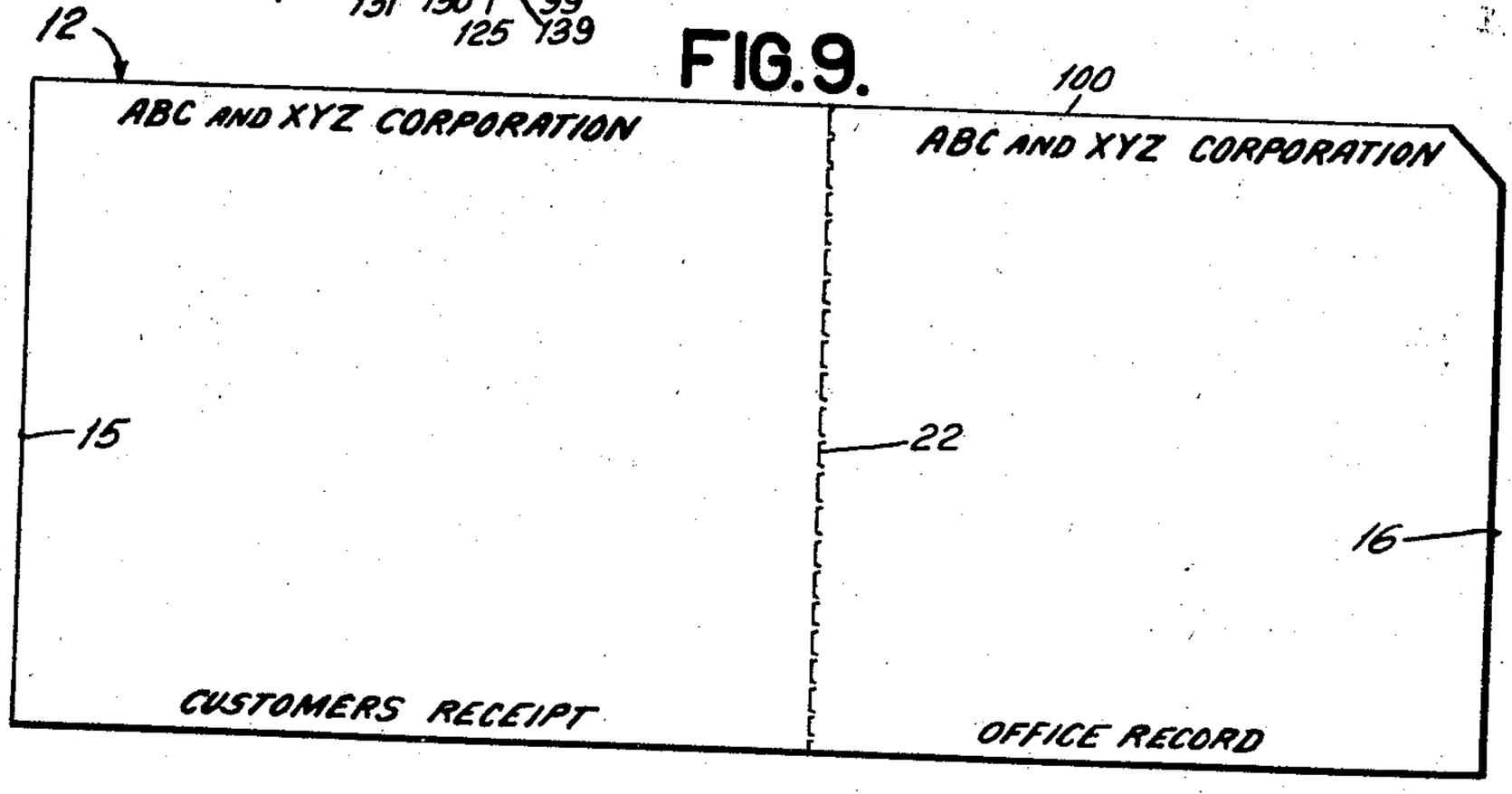
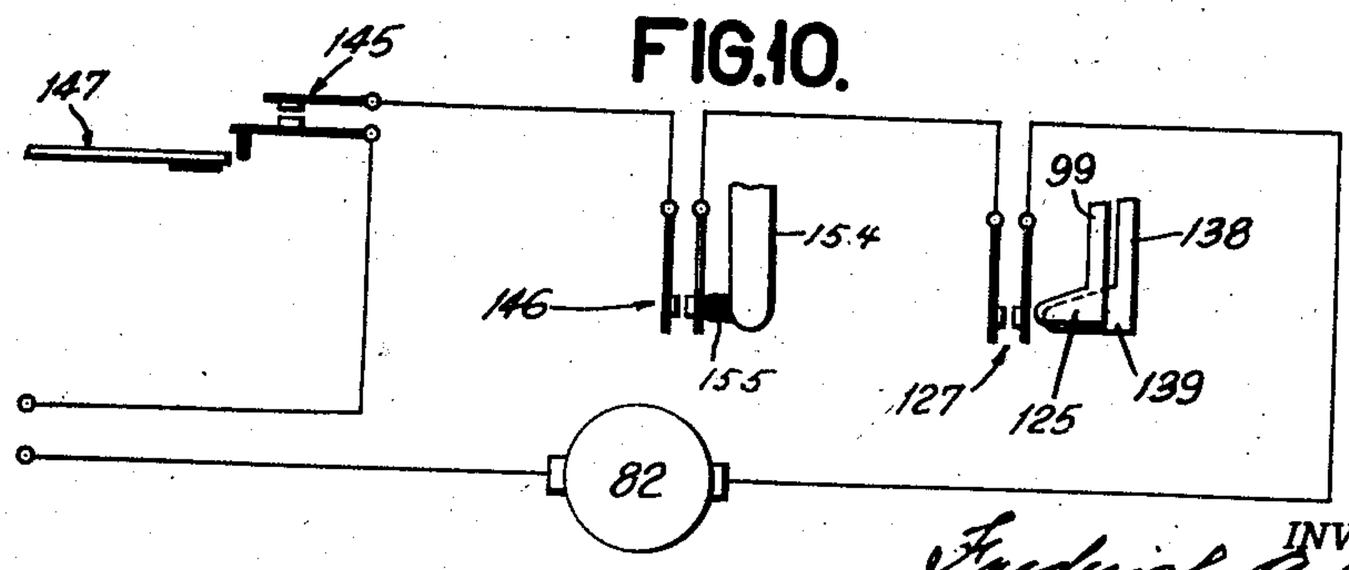


FIG.10.



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ARTICLE-CONTROLLED GRIPPING, PRINTING, AND SEVERING MACHINE

Filed Aug. 28, 1942 5 Sheets-Sheet 5

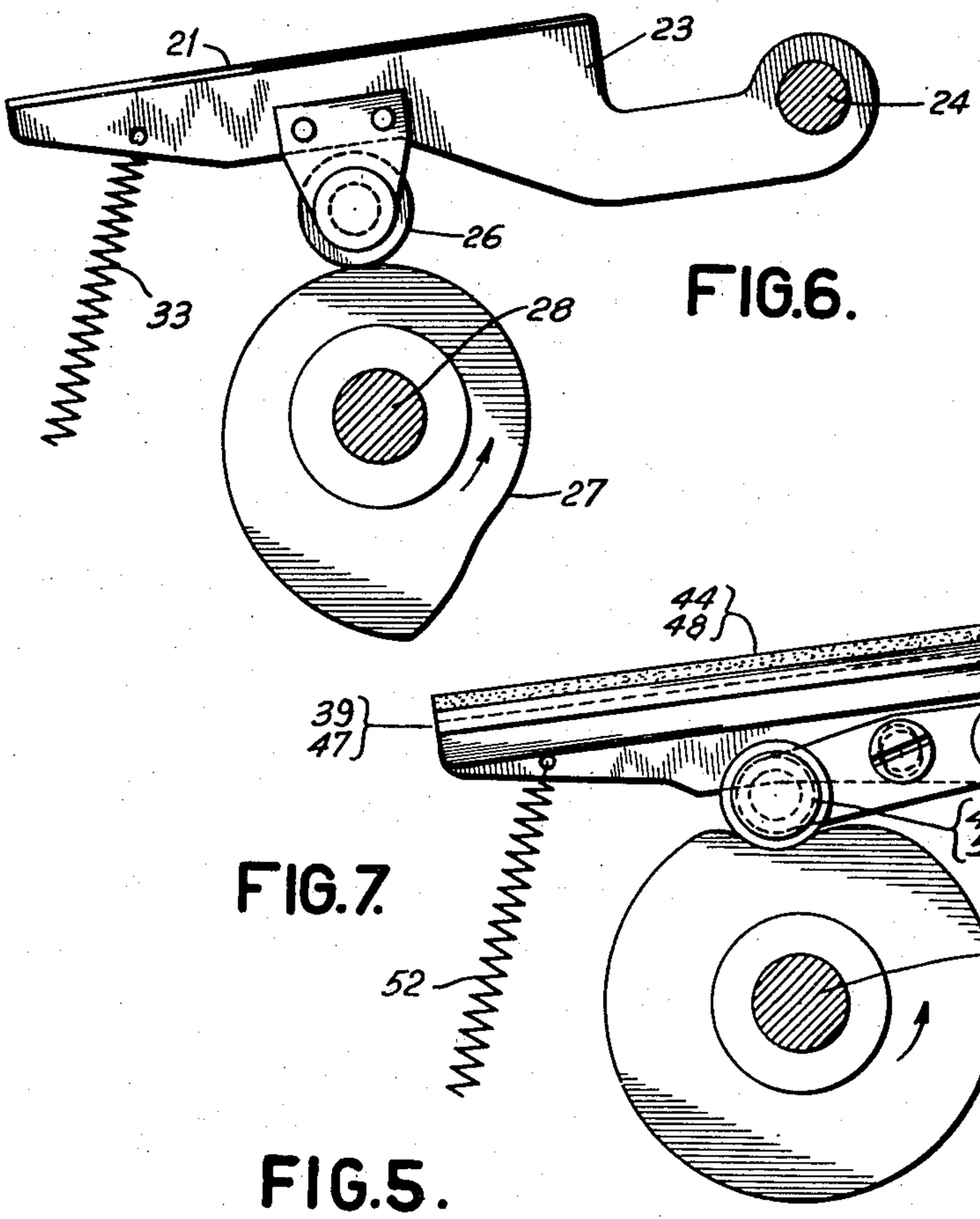


FIG.6.

FIG.7.

FIG.5.

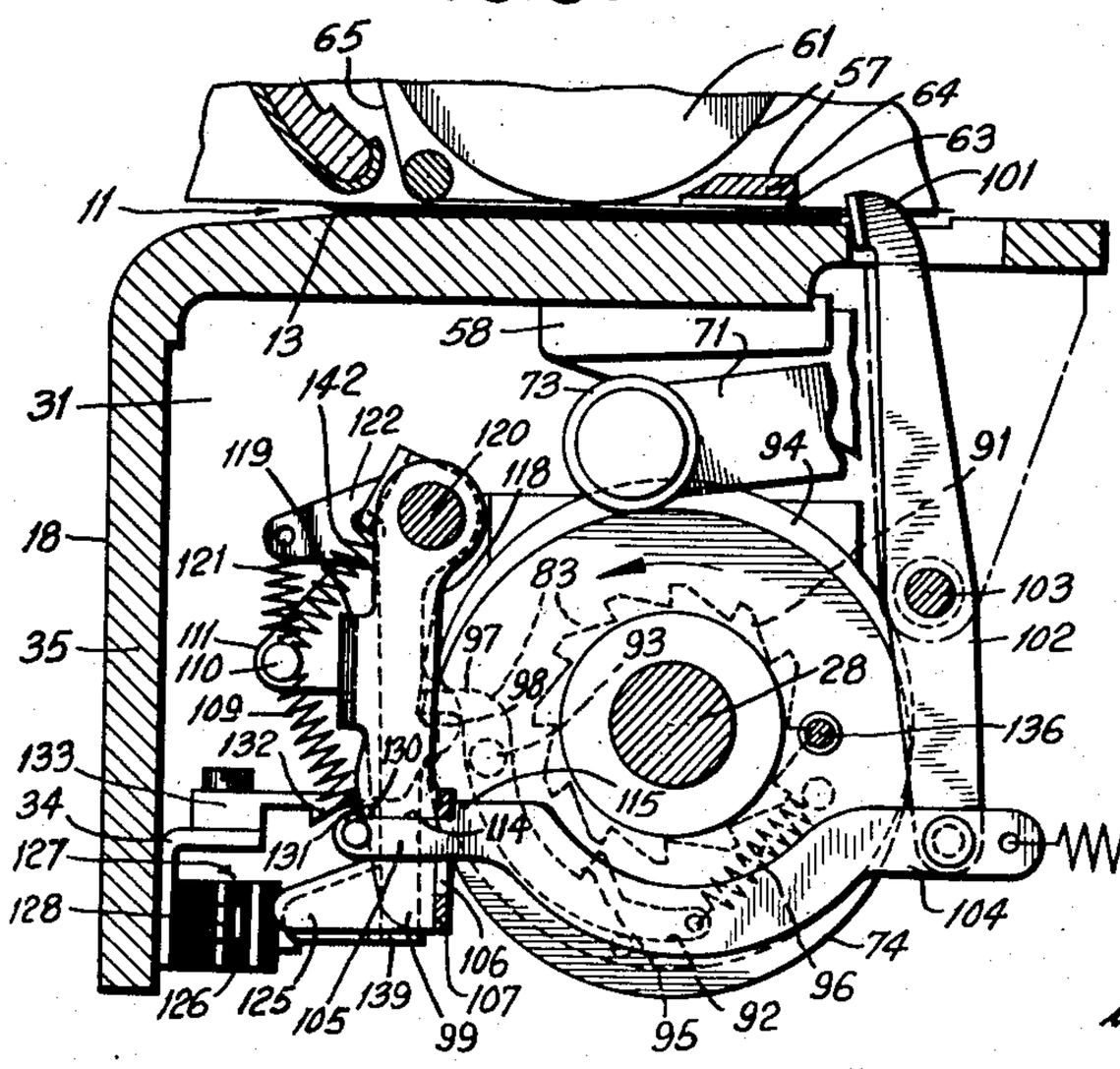
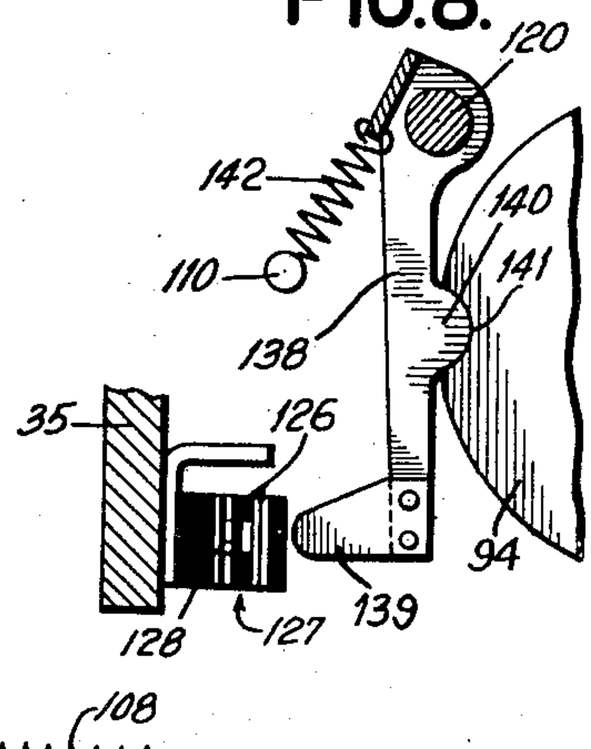


FIG.8.



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Patented Sept. 16, 1947 2,427,418

UNITED STATES PATENT OFFICE

2,427,418

ARTICLE-CONTROLLED GRIPPING, PRINTING, AND SEVERING MACHINE

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Application August 28, 1942, Serial No. 456,502

1 Claim. (Cl. 101—90)

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This invention relates to record printing or stamping machines, such as are used to print desired data or information on record sheets usually inserted in a slot provided in the machine.

An object of this invention is to provide a machine of the above character which is of improved construction and arrangement of parts.

A further object is to provide a machine of the type referred to which in one simple operation effectively divides a record sheet into two parts and prints the desired matter on both parts.

A still further object is to provide a machine of the above type wherein an improved means is provided which requires that the record sheet be both fully inserted in the slot and straight within the slot before the machine can be operated.

Other objects of the invention will be pointed out in the following description and claim and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is an end elevation of a record stamping machine constructed in accordance with the present invention, and showing the end wall as partially broken away to expose the interior working parts, the latter portion of the view being in vertical section taken on the line 1—1 of Fig. 2, and the moving parts of the machine being shown in their relative position when the machine is at rest or between successive operating cycles.

Fig. 2 is transverse vertical section taken on the line 2—2 of Fig. 1, but with the movable parts shown in their relative position when the machine is at the mid-point in an operating cycle.

Fig. 3 is a fragmentary top plan view taken on the line 3—3 of Fig. 1 and showing the moving parts in the same relative position as Fig. 1.

Fig. 4 is a fragmentary vertical section through the base or body of the machine and showing the same relative position of moving parts as Fig. 1, the plane of the section being indicated by the line 4—4 of Fig. 2.

Fig. 5 is also a fragmentary vertical section of the machine with the parts in the same position as Fig. 1, the section being taken on the line 5—5 of Fig. 2.

Fig. 6 is a detail view showing in side elevation the movable element for dividing the record sheet and its operating cam, the position of the parts being the same as Fig. 1.

Fig. 7 is a view like Fig. 6 showing the movable gripper bar and its operating cam.

Fig. 8 is a fragmentary vertical sectional view

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taken on a plane parallel to and slightly in back of the plane of Fig. 5 and showing the lever and its operating cam, which operates immediately after the start of an operating cycle to hold the switch appearing in Fig. 5, closed until such cycle is completed.

Fig. 9 is a plan view showing one form of record sheet or card which may be stamped and divided by the machine appearing in the preceeding views.

Fig. 10 is a wiring diagram showing schematically an electric circuit for operating the record stamping machine.

As will be apparent to those skilled in this art, the present invention is capable of a wide variety of applications. By way of example, the machine disclosed as being one preferred embodiment of this invention, may function as a receipt-date stamp for bills or statements of the type made with two separate parts bearing duplicate information, one part to be returned to the customer after payment and the other part to be retained by the creditor. This type of bill is customarily used by public utility companies. The machine disclosed will, in one operation, effectively stamp both parts of the bill with the desired record data and divide the bill into its two parts. By way of example, the machine may stamp the part returned to the customer with the word "paid" and with the date of payment and at the same time stamp the date on the part retained by the creditor. It will be appreciated, however, that any other data, or additional data, may be stamped on the two parts of the bill without departing from the spirit or intended scope of the present invention.

Referring now in detail to the construction illustrated the reference numeral 10 indicates the machine in its entirety. The machine is provided with a rectangular slot 11 extending horizontally and inwardly from the front thereof and shaped to receive a record sheet or card to be stamped. The card is shown in Fig. 9 and is indicated by the reference numeral 12. The two lateral sides of the slot are provided by guide members 13 and 14, respectively, fixed within the machine, and the guide members receive the two lateral edges 15 and 16, respectively, of the record sheet.

The machine 10 comprises a casing 17 which is divided horizontally in the plane of the slot into a main body or base part 18 and a cover or head part 19 hinged at its rear as indicated at 20, to the base part 18. During operation, the head 18 is always fixed to the base in the position shown in Figs. 1 and 2, the hinge connection being pro-

vided so that the head may be raised to facilitate access to the slot and the mechanism carried in the head.

The reference numeral **21** indicates a knife-like dividing element, or burster bar, which is mounted within the base **18** and is movable vertically upward across the plane of the slot **11** and functions when a record sheet is in the slot, to divide such sheet into two parts. When the record sheet is in the slot the perforated line **22** on the sheet is in vertical alignment with the path of movement of the element **21**, so that when the dividing element is moved upward the sheet will be divided thereby along the perforated line. Fig. 2 shows the element **21** in its uppermost position which it will occupy after having divided the card. Figs. 3, 4 and 6 show the lowermost position of the element which it will occupy between cycles of operation or when the machine is not in use. The element **21** is here shown as being formed as the outer part of an arm **23** pivotally supported at its other end to a stationary pivot rod or shaft **24** carried by a bracket **25** fixed to the base **18**. A cam follower **26** is fixed to the underside of the arm **23** and engages the periphery of a cam **27** fixed to a driven cam shaft **28**. The driven shaft **28** is rotatably supported by its two ends mounted within journal bearings **29** and **30**, respectively, the bearings being carried by the two sides **31** and **32** of the base **18**. The cam follower **26** is kept in engagement with the cam **27** by a suitable tension spring **33** fixed at one end to the element **21** and its other end to a fixed bracket **34** secured to the front wall **35** of the base **18**.

Two pairs of sheet-gripping members **36** and **37** are positioned on opposite sides of the dividing element **21**. The pair **36** comprises fixed and movable members **38** and **39**, respectively, arranged in opposed relation on opposite sides of the plane of the slot **11**. The fixed member **38** is carried by the head **19** and a strip of suitable material **40**, such as rubber, is fixed to its underface and functions as a gripping surface. The movable gripping member **39** is mounted for vertical reciprocating movement and is formed as a part of an arm **41** which is pivoted at one end thereof to the support shaft **24**. A cam follower **42** is fixed to the underside of the arm and engages the periphery of a cam **43** carried by the driven shaft **28**. The upper gripping surface of the movable gripping member **39** is formed by a strip of suitable material such as rubber indicated at **44**.

Likewise, the other pair **37** of sheet-gripping members comprises a fixed member **45** carried by the head **19** and having a rubber gripping surface **46** on its underface, and a movable member **47** mounted for vertical reciprocating movement in the base **18** and having an upper gripping surface **48** cooperating with the surface **46** of the fixed member **45**. The movable member **47** is identical in construction with the previously described movable member **39**. Fig. 7 can be considered as a side elevation of either movable gripping member **39** or member **47**, depending upon whether one is looking to the right or to the left, as viewed in Fig. 2. Consequently both sets of reference characters have been applied to Fig. 7. The member **47** forms a part of an arm **49** pivotally supported at one end to the pivot shaft **24** and has a cam follower **50** depending therefrom and engaging the periphery of a cam **51** fixed to the driven shaft **28**.

Tension springs **52** attached at their upper

ends to the members **39** and **47** and at their lower ends to the bracket **34** serve to keep the movable gripping members in engagement with their respective cams. With a record sheet **12** in the slot **11** and the driven shaft **28** being rotated, the movable gripping members **39** and **47** will simultaneously move vertically upward and engage the under surface of the record sheet and press the sheet firmly against the gripping surface of the fixed members **38** and **45** and thereby firmly hold the record sheet against movement in the slot. In Figs. 1, 4, and 7, the movable gripping members are shown in their lowermost position. From an examination of the shape of the cams **43** and **51**, it will be apparent that as the cams start to rotate the members **39** and **47** will be moved to their uppermost position almost immediately. The cams **43** and **51** are identical and occupy the same circumferential position on the shaft. Consequently, the members **39** and **47** move up and down simultaneously. It is noted that the two pairs of gripping members **36** and **37** are arranged closely adjacent and on opposite sides of the dividing element **21**. They, therefore, hold the sheet **12** firmly while it is struck by the upwardly moving dividing element **21**, thereby providing an effective means for dividing the sheet **12**.

Also arranged on opposite sides of the dividing element **21**, are two pairs of printing members **55** and **56** respectively. The pair **55** comprises a fixed member **57** carrying printing characters and a vertically movable platen member **58** which are arranged in opposed relation on opposite sides of the plane in the slot. Also, the pair **56** comprises a fixed member **59** carrying printing characters and a movable platen member **60** arranged on opposite sides of the plane of the slot **11**. It is noted that, insofar as the present invention is concerned, the machine **10** may be constructed to print any desired data or information on the record sheet. I have shown the fixed printing members **57** and **59** as each comprising a series of date wheels **61** carried by a horizontal shaft **62** rotatably mounted at its end in the head **19**. As will be readily appreciated, the wheels **61** can be individually adjusted on the shaft **62** to change the date, but while the machine is operating they are fixed. Hence, they are fixed members in an operating sense, but are independently adjustable for changing the date. In addition to the date wheels the fixed member **57** of the pair **55** of printing members may include an electroplate **63** fixed to the under surface of a horizontal bar **64** carried by the head **19** (see Fig. 5). The electroplate may carry any desired data such as the word "paid."

The usual inking ribbon **65** is disposed between each of the fixed members **57** and **59** and the plane of the slot **11**. Each inking ribbon is wound around rollers **66** mounted within the head **19** and is attached at its ends to spools **67** and **68** rotatably mounted in the head **19** and operated by the usual mechanism in timed relation with the operation of the machine.

The movable platens **58** and **60** are identical in construction and are moved upwardly simultaneously to press the sheet **12** against the members **57** and **59** for printing. As shown the movable platen **58** is carried by the outer end of an arm **70** which is pivoted at its other end to the support shaft **24**. A second arm **71** is pivotally supported by the shaft **24** and extends alongside the arm **70** and is adjustably fixed

thereto by a bolt 72. The second arm 71 is provided at its outer end with a cam follower 73 which is held in engagement with the peripheral face of a cam 74 fixed to the driven shaft 28. Likewise, the other movable platen member 60 is carried by the outer end of an arm 76 pivotally supported by the shaft 24 and adjustably fixed to a second arm 77 also pivotally supported at one end to the pivot shaft 24. The arm 77 carries a cam follower 78 engaging the periphery of a cam 79 which is fixed to the driven shaft 28. The cams 74 and 79 are identical in construction and occupy the same circumferential position on the driven shaft 28. The cam 79 appears in side elevation in Fig. 1 and the cam 74 in Fig. 5. The movable platen members 58 and 60 are kept in constant engagement with their respective cams by coil springs 80 attached at their upper ends to the platen members and at their lower ends to the fixed bracket 34 on the base 18.

In accordance with the present invention, there is also provided a mechanism for operating the driven shaft 28, which mechanism is initiated by the insertion of a card or record sheet in the slot 11 and acts to rotate the driven shaft 28 one complete revolution and then to stop rotation of the shaft. As stated, the cams 43 and 51 are so shaped and positioned on the driven shaft that immediately after the rotation of the shaft 28 is begun the movable gripping members simultaneously engage the record sheet and hold it firmly against movement in the slot. The platen members 58 and 60 are moved gradually upward and simultaneously by their cams 74 and 79 and attain their uppermost position, where printing is effected at about the mid-point of the shaft rotation, which is 180° from the position shown in Figs. 1 and 5. Upon examination of the shape of cam 27 in Figs. 4 and 6, it will be apparent that the dividing element 21 is not moved until the shaft approaches the mid-point of the rotation of the shaft 28 and then the element 21 is moved quickly upward by its cam to deliver a sharp blow to the record sheet, thereby effectively dividing the same into its two parts. The uppermost end of movement of the dividing element 21 is attained at approximately the mid-point in the rotation of the shaft 28.

The operating mechanism for the driven cam shaft 28 comprises an electric motor 82 mounted in the base 18 and connectable by a one-revolution clutch 83 to the shaft 28. The motor circuit is closed and the clutch 83 simultaneously engaged as a result of inserting the record sheet for the full depth and straight within the slot. The cam shaft 28 is then rotated one complete revolution and the clutch 83 disengaged. The structure is such that the act of disengaging the clutch also results in preventing further rotation of the cam shaft. The motor circuit is opened simultaneously with disengagement of the clutch. This comprises a cycle of the operation of the machine and it is repeated each time a record sheet is inserted in the slot.

The electric motor includes a motor shaft 84 and the latter is connected by spur gears 85 and 86 to a shaft 87 carrying a worm gear 88 which meshes with a worm wheel 89 fixed to a driving sleeve 90 rotatably mounted on the outer surface of the driven cam shaft 28. The driving sleeve 90 is adapted to be connected to the driven shaft 28 by the one revolution clutch 83 each time the record sheet is inserted in the slot. The clutch comprises a ratchet wheel 91 fixed to the

sleeve 90 and a dog 92 pivoted on a stud 93 carried by the side of a disk 94, the latter being fixed to the driven shaft 28 (see Figs. 2 and 5). The pivoted dog includes a tooth 95 which is constantly urged by a spring 96 into engagement with the ratchet wheel to clutch the rotating driving sleeve 90 to the driven shaft 28. Between cycles of operation the shaft 28 is stationary and the dog 92 is held out of engagement with the ratchet wheel by a tail 97 of the dog engaging a stop 98 carried by a latch lever 99. This is the position shown in Fig. 5. When the lever 99 is moved to the left as viewed in Fig. 5, the stop 98 moves out of engagement with the tail 97 and the clutch tooth 95 engages ratchet 91 and as a result the cam shaft 28 starts rotating. Before the shaft 28 completes one revolution the latch lever 99 is moved back to the position shown in Fig. 5 where the stop 98 is in the path of movement of the tail 97. Consequently, the tail 97 will strike the stop 98 and thereby cause the dog to pivot about the stud 93 and disengage the tooth 95 from the ratchet 91, thus holding the shaft 28 in its idle position until by the insertion of another sheet 12 in the slot 11 the latch lever is again moved to disengage the stop 98 from the tail 97.

As the record sheet is inserted in the slot 11 the rear edge 100 thereof engages and moves rearwardly the upper end 101 of a trip lever 102, located on the left-hand side of the machine as viewed from the front (see Figs. 2 and 3), and the lever is pivoted on a stud 103 carried by a bracket 104*a* fixed to the base 18. The lower end of the trip lever 102 is pivoted to the rear end of a link 104 which extends forwardly therefrom to the front of the machine and its forward end 105 slides through a vertical slot 106 formed in a lateral flange 107 of the latch lever 99. In Fig. 5, the plane of the section passes through the flange 107 so as to show the slot 106 clearly. The trip lever 102 and link 104 are urged rearward by a tension spring 108 connected to a stationary part of the machine, and the forward end 105 is urged upward to the top of the slot 106 by a tension spring 109 connected to a stud 110 carried by a bracket 111 fixed to the side of the housing 112 enclosing the worm 88 and worm wheel 89 (see Fig. 3). The upper surface of the forward end 105 is notched as indicated at 114, and the rear end or shoulder 115 of this notch engages the rear face of the flange 107 above the slot 106 between cycles of operation, the position shown in Fig. 5.

The latch lever 99 comprises two parallel arms 117 and 118 connected at their front by a cross plate 119 and both arms are pivotally supported at their upper ends by a stud 120 carried by the fixed bracket 111. The arm 117 carries the stop 98 and the arm 118 the lateral flange 107 having the vertical slot 106. The latch lever 99 is constantly urged to the rear toward latching position by a spring 121 connecting an ear 122 on the lever to the fixed stud 110.

As the link 104 is moved forwardly due to the record sheet engaging the upper end 101 of the trip lever 102, the link carries with it the latch lever 99 due to engagement of the rear shoulder 115 and rear face of the flange 107, and this results in disengagement of the stop 98 from tail 97 and in the tooth 95 engaging the ratchet 91. Simultaneously, a switch actuating element 125 extending rearwardly from the arm 118 engages and moves a resilient contact carrying arm 126 of a switch 127 into circuit closing engagement

with a fixed contact 128 (see Fig. 3). The switch 127 is in the motor circuit (see also Fig. 10). The member 126 due to its resilience is constantly urged toward circuit opening position.

The extreme forward end of the link 104 is shaped as a hook 130 and is provided with an upper beveled surface 131 facing both upwardly and forwardly. As the link 104 is moved forwardly, the surface 131 engages a rearwardly and downwardly facing beveled surface 132 on a catch 133 carried by the fixed bracket 34, and results in the forward end 105 being moved downward until the hook 130 engages the catch 133 and thereby holds the link 104 in its forward position. The link is held in this position until a pin 136 (see Fig. 3) projecting from the side of the cam 43 strikes the link near the end of the single revolution of the shaft and thereby moves the link downward to disengage the hook 130 from the catch 133.

When the end 105 of the link is moved downward by engagement of the beveled surfaces 131 and 132, the rear shoulder 115 of the notch becomes disengaged from the flange 107 and the latch lever 99 is moved back by its spring 121 to the position where the stop 98 is in the path of the tail 97. However, this movement of the lever 99 will not open the contacts 126 and 128, because immediately after the cam shaft 28 begins to rotate a lever 138 carrying an actuating element 139 is moved into engagement with the member 126 to hold the switch closed (see also Fig. 8). The lever 138 is pivoted to the stud 120 between the two arms 117 and 118 of the latch lever 99 and a rounded projection 140 on the rear of the lever 138 engages the periphery of the disk 94. A spring 142 attached to the stud 110 and lever 138 urges the lever counterclockwise as viewed in Fig. 8. Between cycles of operation the projection fits within a recess 141 in the periphery of the disk 94 and the element 139 is out of engagement with the movable contact carrying arm 126. When the shaft 28 begins to rotate the projection 140 is cammed out of the recess 141 to the high part of the periphery of the disk 94 and the element 139 moved thereby into the position to hold the contacts closed, which it will continue to do until the single revolution of the shaft is completed when the projection 140 again moves into the recess 141 to open the switch 127.

It is noted that the switch actuating element 125 and the element 139 are both made of insulating material and they are indicated as such in Fig. 3; but, for the sake of clarity, they are not so indicated in the other views where they appear.

From an examination of Fig. 10, it is noted that the motor circuit includes two other switches indicated at 145 and 146 respectively, which are connected in series with the switch 127 and the motor 82. The switch 145 is one which is closed by the insertion of an operator's key 147 which fits within a slot 148 extending through the end wall 31 of the base 18 and within a guide element 149 aligned with the slot 148 and fixed to the head 19 (see Fig. 2). Thus, the machine cannot be operated unless the head is in position on the base so that the operator can insert his key 147 and close the switch 145.

The switch 146 is closed by a second trip lever 150 which is arranged at the right-hand side of the machine as viewed from the front, and is also actuated by the rear edge 100 of the record sheet 12, which engages the upper end 151 of the lever 150 and moves the latter rearwardly to switch closing position. Before the machine can be operated, the rear edge of the sheet must engage and move both trip levers 102 and 150 to close both switches 127 and 146. As the levers 102 and 150 are spaced from one another across the width of the slot, it is necessary that the sheet 12 be straight within the slot as well as fully inserted within the slot.

The right-hand trip lever 150 can best be seen in Figs. 1, 2 and 3. As shown, the lever is pivoted to a stud 152 carried by a bracket 153 fixed to the base 18 and the lower end 154 of the trip lever carries a forwardly extending switch closing element 155 which is adapted to engage and move a resilient contact carrying arm 156 of the switch 146 into circuit closing position with respect to its cooperating fixed contact 157. A link 158 is pivoted at its rear end to the lower end 154 of the trip lever and extends forwardly therefrom. The forward end of the link is formed with a slot or yoke part 159 which receives the cam shaft 28 and with a cam follower 160 held in engagement with the outer surface of a collar 161 fixed to the cam shaft. The outer surface of the collar is cylindrical except for a recess 162 which is so positioned that it receives the cam follower when the cam shaft is idle, or the position it occupies between cycles of operation. The resilience of contact arm 156 acting through the element 155, lever 150, and link 158 is enough to keep the cam follower 160 in engagement with the collar 161. Thus when the switch 146 is initially closed by the record sheet moving the trip lever 150, the link 158 is also moved rearwardly; and when the shaft 28 begins to rotate the recess 162 moves from the follower 160 and the latter engages the higher cylindrical surface of the collar 161. The link 158 will thus be held in its forward position and with it the lower end 154 of the trip lever and the switch closing element 155 will be held in the switch closing position.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claim:

What is claimed is:

In a cyclically operable machine for simultaneously stamping and severing a record sheet and having a slot extending inwardly from an outer defining wall portion thereof and being so formed as to receive and position a fully inserted record sheet in a predetermined manner, the combination of a reciprocally mounted burster element movable from an initial position, at one side of the plane of the slot, towards and through the plane of the slot and so as to engage and sever, along a transverse line, a fully inserted record sheet positioned therein; sheet gripping means comprising a pair of spaced reciprocally mounted gripping members located, respectively, at opposite sides of said burster element and being movable from respective initial positions, at one side of the plane of the slot, towards the plane of said slot and into gripping engagement with a fully inserted record sheet at spaced positions located, respectively, on opposite sides of and adjacent to the transverse line of engagement of said burster element; printing

means comprising a reciprocally mounted printing element movable from an initial position, at one side of the plane of said slot, into printing engagement with an inserted record sheet; and power operated means for effecting an operating cycle of said machine each time a record sheet is fully inserted in said slot; and said power operated means including means operable at the beginning of each cycle to move said gripping members from their said initial positions into gripping engagement with the inserted sheet and to hold such sheet against movement for a predetermined period of time, and operable during the latter portion of each cycle to return said gripping members to their said initial positions, means operable during each cycle for moving said burster element from its said initial position and into severing engagement with the inserted sheet while the latter is being held against movement by said gripping members and then moving said burster element back to its said initial position, and means also operable during each cycle for moving said printing element from its said initial position and into printing engagement with said inserted sheet while the latter

is held by said gripping members and then returning said printing element to its said initial position.

FREDERICK Q. RAST.

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