

949,257.

E. E. BARNEY.
TYPE WRITING MACHINE.
APPLICATION FILED AUG. 6, 1907.

Patented Feb. 15, 1910.

4 SHEETS—SHEET 1.

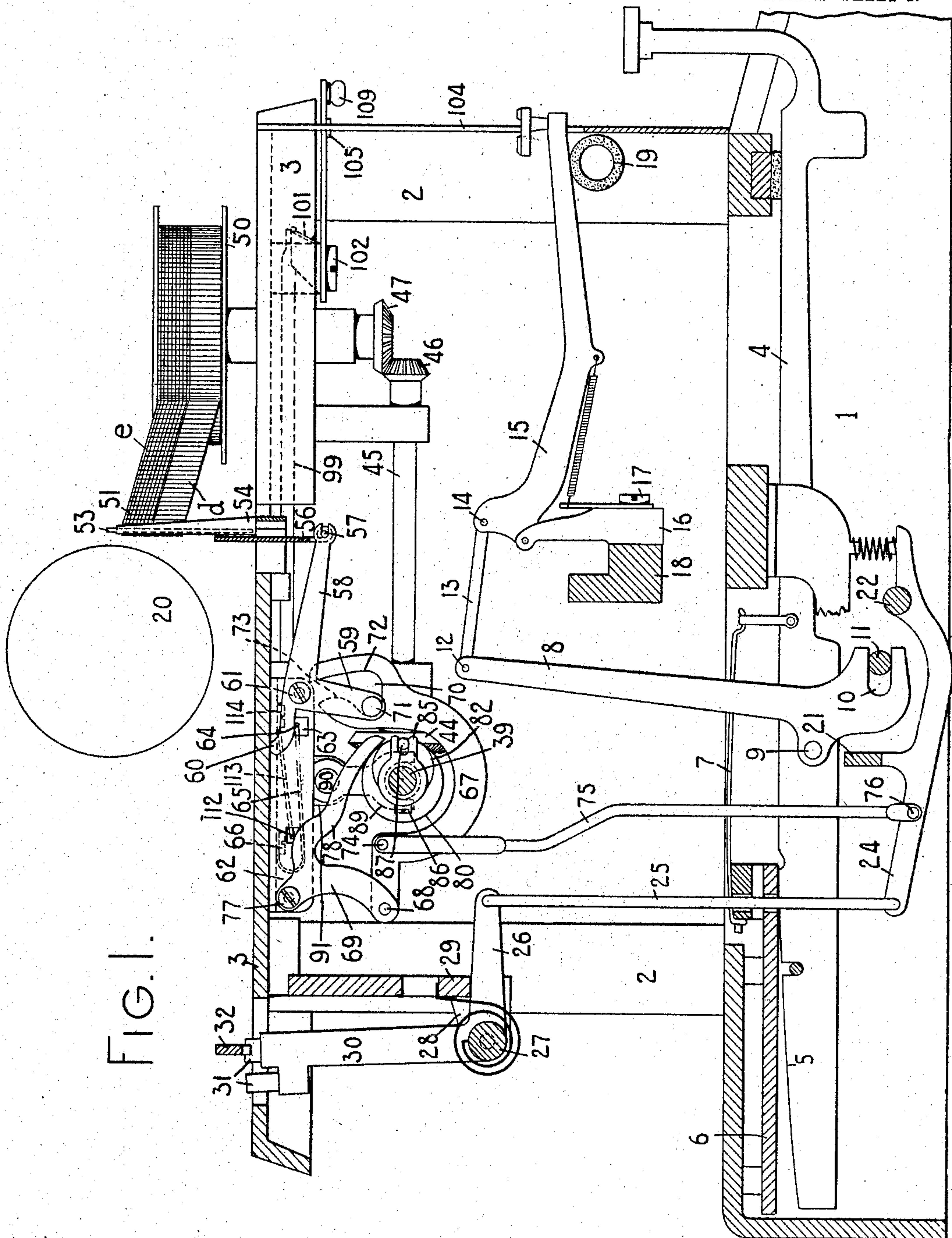


FIG. 1.

WITNESSES.

J. B. Reeves.
Charles Smith

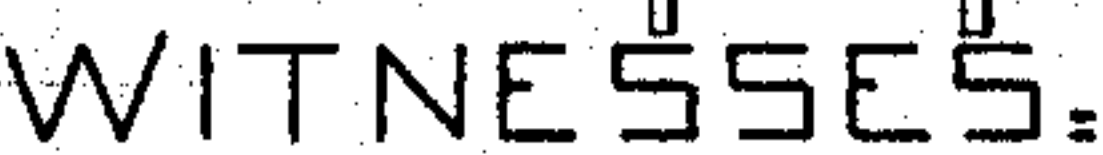
INVENTOR.

Edwin E. Barney
By Jacob F. Felt
HIS ATTORNEY

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4 SHEETS—SHEET 2.



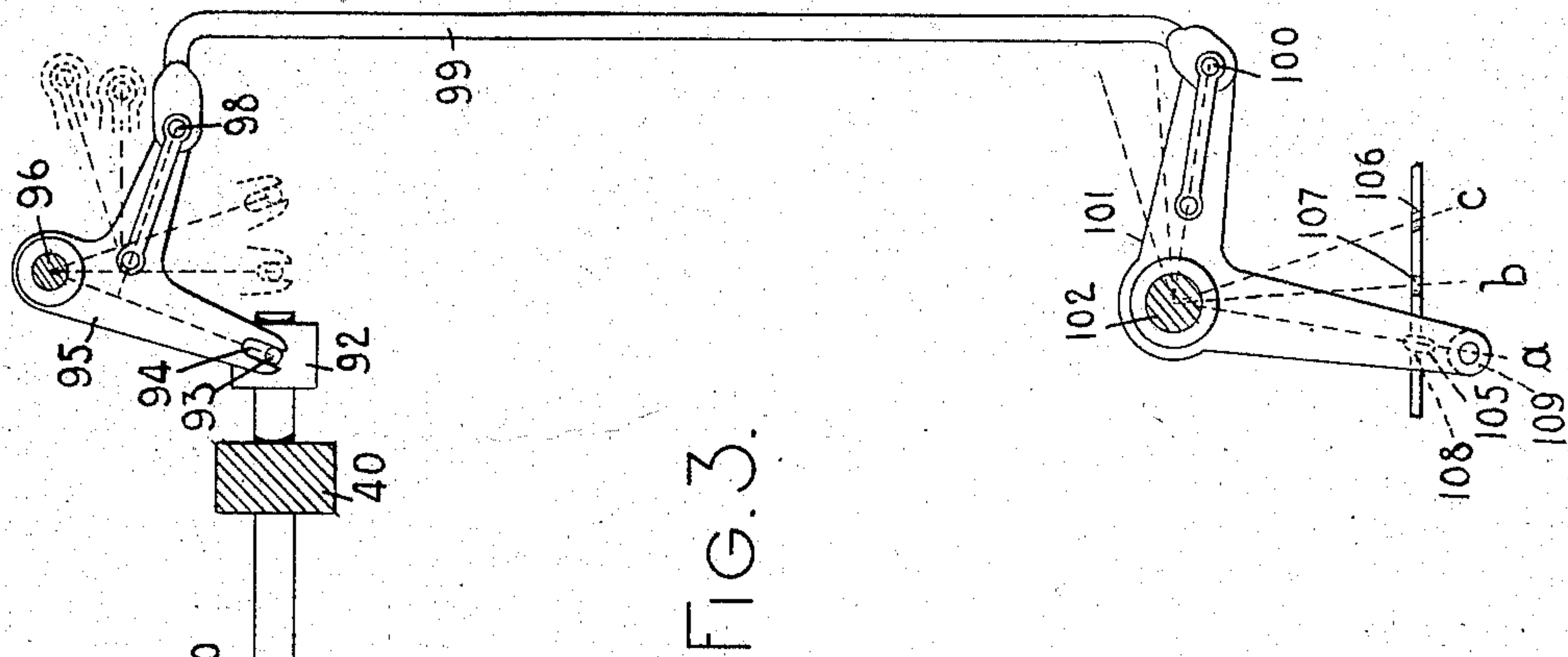
J. B. Reeves.
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4 SHEETS—SHEET 3.



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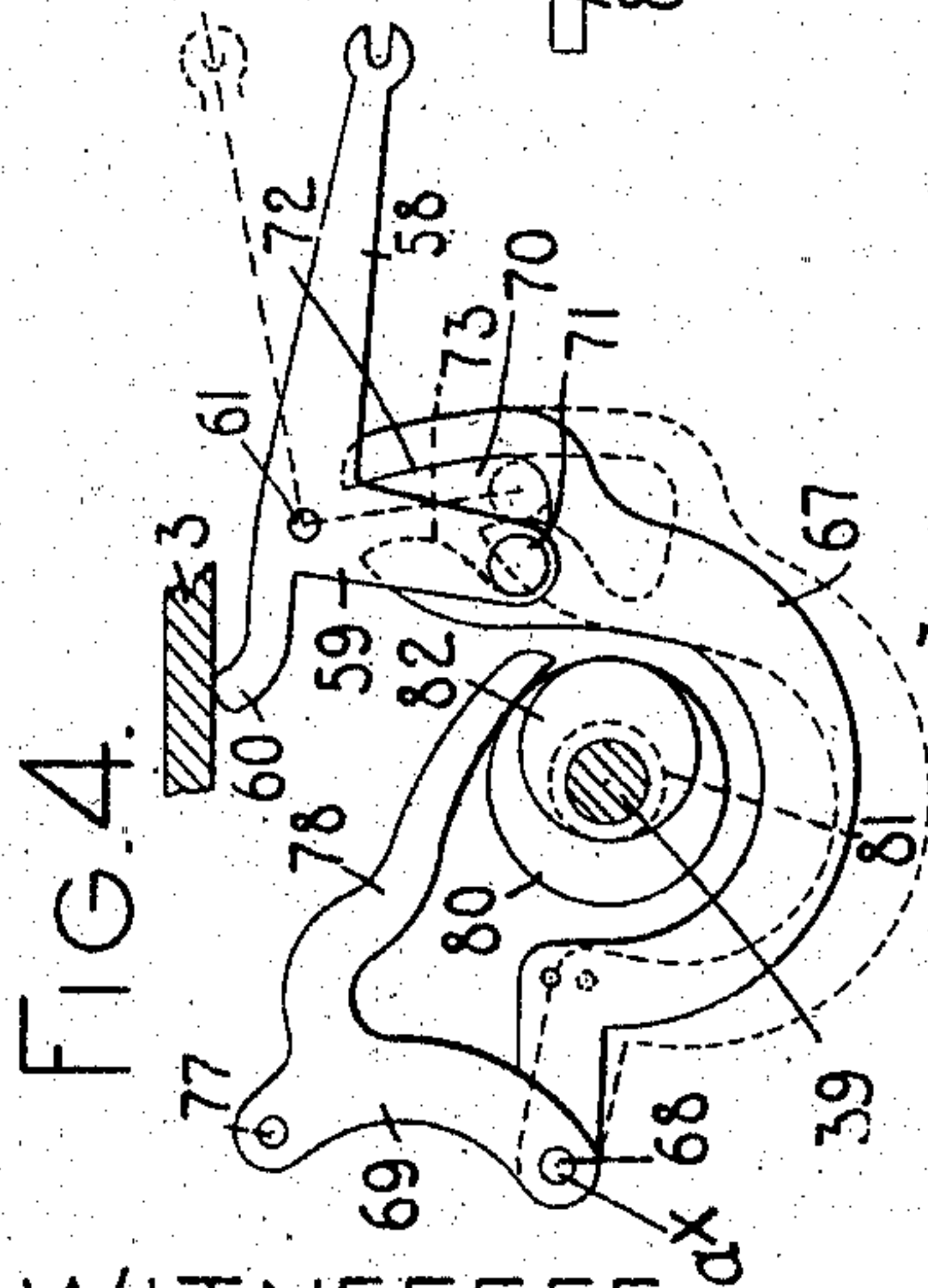
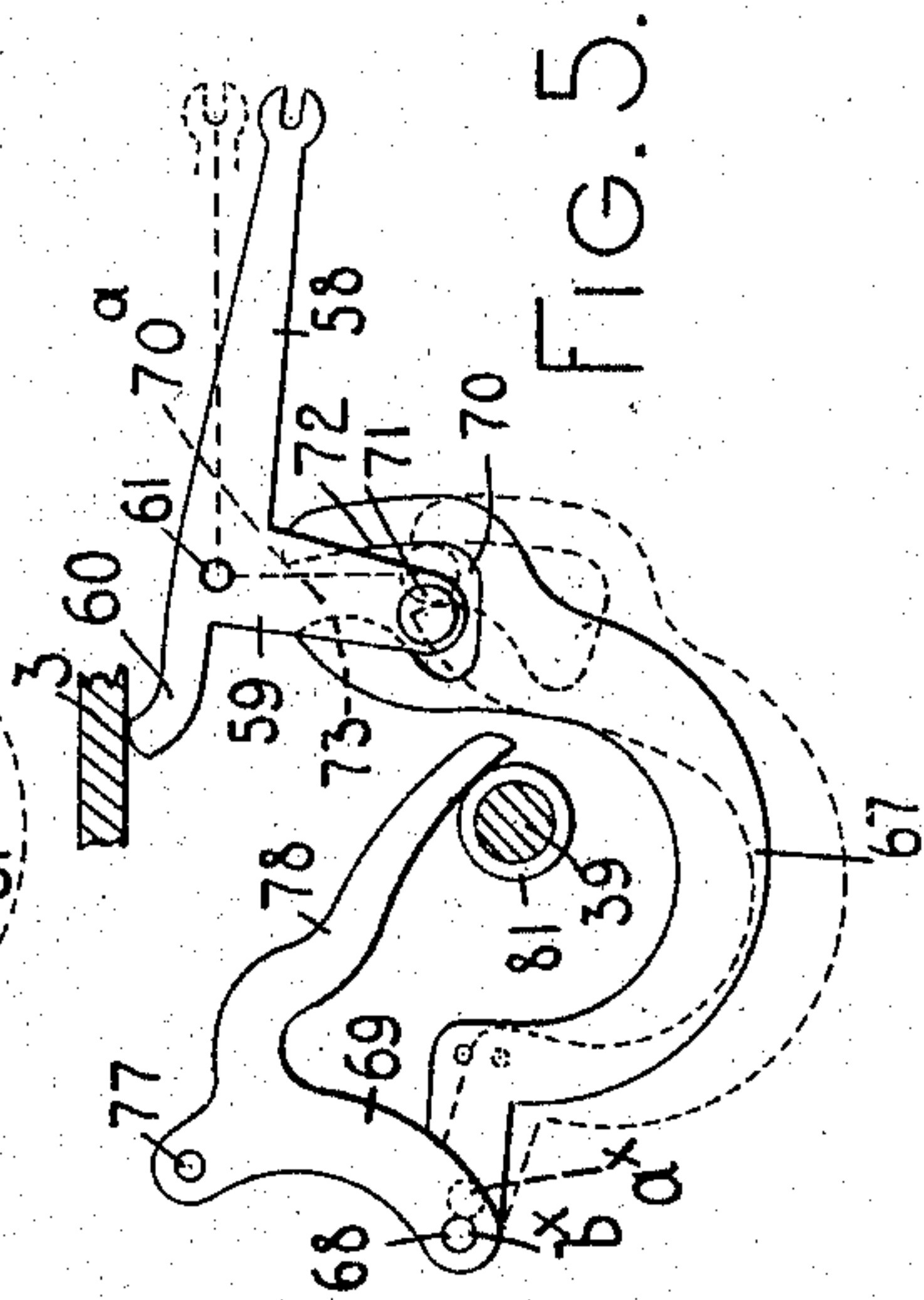


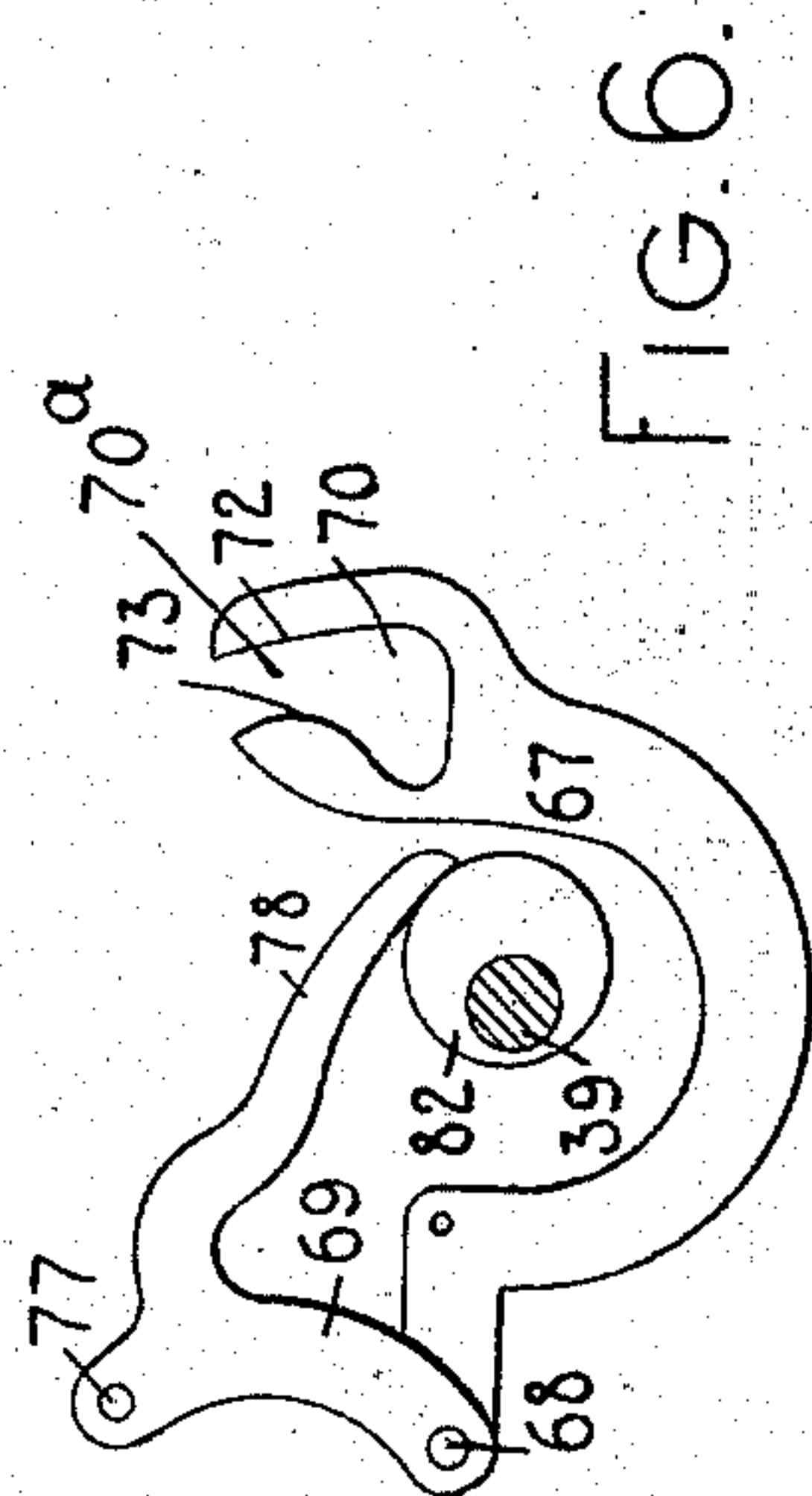
FIG. 4.

WITNESSES:

J. B. Kears.
Charles Smith



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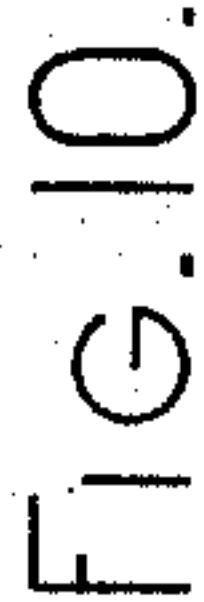
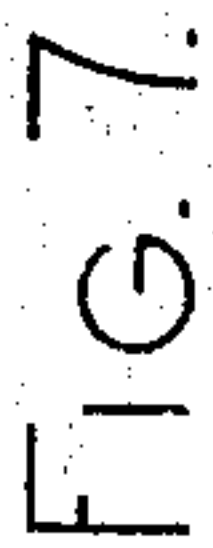
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INVENTOR:

Edwin E. Barney
By Jacob Fabel
HIS ATTORNEY

E. E. BARNEY.
TYPE WRITING MACHINE.
APPLICATION FILED AUG. 6, 1907.

4 SHEETS—SHEET 4.



J. B. Reeves.
Charles Smith

Edwin E. Barney
By Jacob Felber
HIS ATTORNEY

UNITED STATES PATENT OFFICE.

EDWIN E. BARNEY, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MONARCH TYPE-WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

949,257.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed August 6, 1907. Serial No. 387,306.

To all whom it may concern:

Be it known that I, EDWIN E. BARNEY, a citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to ribbon mechanisms for such machines.

One object of my invention is to provide simple and efficient mechanism for varying the line of impact of the types along the ribbon.

Another object of the invention is to provide means operable at will to bring one or another field of the ribbon, and preferably fields of different colors, into use.

A still further object of my invention is to provide means operable at will to render the ribbon vibrating mechanism inoperative to move the ribbon to the printing point, for writing on mimeograph sheets.

Certain of the broad features herein disclosed are not claimed as they form in part the subject-matter of my prior application Serial No. 324,956, filed July 6th, 1906, and are claimed in said prior application.

To the above and other ends which will hereinafter appear, my invention consists of the features of construction, arrangements of parts and combinations of devices to be set forth in the following description and particularly pointed out in the appended claims.

In the drawings wherein like reference characters indicate corresponding parts in the different views, Figure 1 is a central, vertical, fore and aft, sectional view of one form of typewriting machine embodying my invention. Fig. 2 is a transverse vertical sectional view of the same, the section being taken forward of the top plate of the machine. Fig. 3 is a fragmentary detail plan view of portions of the ribbon vibrator controlling means. Figs. 4, 5 and 6 are detail side views partly in section of parts of the ribbon vibrator controlling means, these views showing different dispositions of the parts under different adjustments of the controlling means. Fig. 7 is a detail fragmentary front elevation of a modified form of controlling member. Figs. 8, 9

and 10 are side elevations similar to Figs. 4, 5 and 6 but showing a modified form of construction.

I have shown my invention embodied in a typewriting machine resembling the Monarch machine though it should be understood that the invention may be employed in other styles of machines.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. Printing key levers 4 have curved treads 5 which coöperate with a fulcrum plate 6, each key lever being restored to normal position by a restoring spring 7. Each key lever has an upright sub-lever 8 pivoted thereto at 9, the lower end portions of the various sub-levers being slotted at 10 for coöperation with a fixed fulcrum rod 11 which extends beneath the key levers and is secured at its ends in the base of the machine. The upper end of each sub-lever is pivoted at 12 to a link 13, the latter being pivoted at its forward end 14 to a type bar 15. Each type bar is pivoted to a hanger 16, secured by a screw 17 to a type bar segment 18. The forward ends of the type bars are supported on a type bar rest 19, the type bars being segmentally arranged to strike upwardly and rearwardly against the front face of a platen 20 diagrammatically illustrated in Fig. 1. The platen is carried by the usual or any suitable carriage which travels across the top plate from side to side of the machine. A universal bar 21 extends beneath the key levers 4 and is carried by a spring restored frame of which the rock shaft 22 forms a part, said shaft being journaled at its ends on cone pivot screws 23 (Fig. 2). A rearwardly extending arm 24 forms part of a universal bar frame and is connected at its rear end to an upwardly extending link 25 which in turn is connected at its upper end to a forwardly extending arm 26 which projects from a rock shaft 27 of a spring restored dog rocker, the ends of said shaft being journaled in bearings in arms 28 of a bracket plate 29. An upwardly extending arm 30 on the dog rocker carries feed dogs 31 which coöperate with a feed rack 32 to control the feed movement of the carriage which is moved from left to right a letter-space distance at each depression of a key lever 4 under the power applied by a spring drum 33 connected to the carriage by a band 34.

The spring drum is operatively connected in the usual manner to a bevel gear 35 which meshes with a companion gear 36, the hub 37 of which bears against a depending bracket arm 38. This gear is mounted upon a shaft 39 which extends transversely of the machine and is received in bearings in the depending bracket arms 38 and 40. A pin 41 projects from the shaft and is received in a slot 42 in the hub of the gear 36 so as to afford a longitudinal movement of the shaft independently of the gear 36 but to connect the gear and shaft to rotate together. The bracket 38 prevents a movement of the gear 36 longitudinally of the shaft 39 in one direction, whereas the engagement of said gear with its companion gear 35 prevents the movement of the gear 36 in an opposite direction, so that it is maintained fixed against movement during the longitudinal movement with the shaft. The shaft 39 also carries, near the left-hand side of the machine, a beveled pinion 43 which meshes with a gear 44 carried by a shaft 45 which extends fore and aft of the machine at the left-hand side thereof and carries a beveled pinion 46 at the forward end which meshes with a beveled gear 47 connected to an upright ribbon spool shaft 48 to which the left-hand ribbon spool 49 is detachably connected.

I have described the train of connections from the spring drum to the left-hand ribbon spool but it should be understood that the train of connections from the pinion 43^a (corresponding to the beveled pinion 43) to the right-hand ribbon spool 50 is the same as that at the left-hand side of the machine and the same reference numerals will be employed to designate the corresponding parts at the right-hand side of the machine. The relative disposition between the beveled pinions 43 and 43^a and their respective co-acting gears is such that when the beveled pinion 43 is in mesh with its companion gear 44 the left-hand ribbon spool will be turned and the right-hand beveled pinion 43^a will be out of mesh with its companion gear. The longitudinal movement of the shaft 39 to the right is effective to throw the right-hand beveled pinion 43^a into mesh with its gear and to throw the left-hand pinion out of mesh with its gear. By these means the ribbon 51 may be alternately wound from one spool to another. The ribbon in passing from one spool to another extends through guide openings 52 in a ribbon vibrator 53 guided in a fixed guide 54 secured by screws 55 to the top plate of the machine.

The mechanism thus far described is somewhat similar to that embodied in the Monarch machine.

The depending stem 56 on the vibrator is pivotally connected at 57 to an arm 58 of a bell crank actuating lever, or member, the

depending arm 59 of which is actuated in a manner to be hereinafter described, to operate the ribbon vibrator. A rearwardly extending arm 60 is provided on the bell crank or angular lever 58—59 to form a stop which co-acts with the under side of the top plate of the machine in order to limit the downward movement of the arm 58 and the ribbon vibrator connected thereto. The angular lever is pivoted on a fixed pivot in the form of a shouldered headed screw 61 received at its threaded end in an opening in an angular bracket plate 62. This bracket plate is apertured at 63 for the free passage therethrough of the bent end 64 of a spring 65 secured at 66 to the bracket 62. The pressure of the spring 65 is exerted upwardly against the arm 60 in order to normally maintain the arm 60 in contact with the top plate and to maintain the vibrator in the lowermost position. A second vibrator actuating lever device or member 67 is pivoted at 68 to a so-called carrier or supporting lever 69. The lever 67 is preferably bent in the manner indicated in Figs. 1, 4, 5 and 6 to clear the shaft 39 and certain of the parts carried thereby. The forward upwardly extending end of this lever 67 is recessed at 70 for the reception of a laterally projecting pin 71 which extends from the depending arm 59 of the angular actuating lever. The recess in the lever is of such formation that it surrounds the pin 71 on at least three sides and provides a wall 72 at one side thereof which corresponds to an arc of which the pivot 68 is the center, whereas the opposite wall of said recess forms a cam 73 for coöperation with the pin 71 as will hereinafter more clearly appear. The actuating lever 67 is pivoted at 74 to a link 75 which is pivotally connected at its lower end as at 76 to the rearwardly extending arm 24 on the universal bar frame. The construction therefor is such that each actuation of a printing key lever is effective to depress the universal bar thereby transmitting movement to the ribbon vibrator actuating lever 67 and at the same time actuating the dog rocker to effect a feed movement of the carriage.

The carrier 69, hereinbefore referred to, is pivoted to the bracket 62 by a shouldered headed screw 77.

A forwardly and downwardly extending arm 78 on the angular lever or carrier 69 extends over the shaft 39 and into a position where it is coöperative with rotative cam or controlling member 79. From an inspection of Fig. 3 it will be seen that this controlling member comprises a cylindrical concentric portion or face 80, a smaller cylindrical concentric portion or face 81 and an eccentric portion or face 82; that the portions 80 and 81 are joined by inclined walls 83 which form a cam, and that the portions 81 and 82

are likewise joined by an inclined portion 84 which forms a cam between the central concentric portion and the eccentric portion 82. These different portions or faces of the member 79 are preferably formed on a single piece mounted on the shaft 39 and free to slide longitudinally thereof. A block-like connecting member 85 is secured to the shaft 39 by a screw 86 and is apertured for the reception and free longitudinal movement of a pin 87 which projects from the member 79 and is parallel with the shaft 39 so that while the member 79 is free to move longitudinally of the shaft it, nevertheless, is connected to rotate therewith. A hub-like portion 88 projects from the member 79 and has a circumferential groove therein for the reception of a bifurcated or fork-like portion 89 secured to a rod 90 mounted in depending brackets 91 and 40. A collar 92 is secured to the outer end of the rod 90 and is provided with a pin 93 which is received in a slot 94 in an angular lever 95 pivoted at 96 to the top plate of the machine at the under side thereof. This bell crank is pivoted at 98 to a link 99, the forward end of which is pivoted at 100 to a second bell crank lever 101 pivoted at 102 to the top plate of the machine at the under side thereof. The forwardly projecting arm of the bell crank 101 extends through a slot 103 (Fig. 3) in the front plate 104 of the machine. A projection 105 is formed on the under side of the forward arm of the bell crank 101 for co-operation with any one of three notches 106, 107 and 108. A finger piece or handle 109 may be provided on the forward end of the bell crank lever 101 by which said bell crank may be moved. By these means the controlling member 79 may be moved at will longitudinally of the shaft 39 in order to change the disposition of said controlling member 79 relatively to the lever arm 78 with which it co-acts but without, however, affecting the rotation of the member 79 effected through the rotation of the shaft 39. Thus, the finger piece 109 may be moved to any one of the three positions indicated by the dotted lines *a*, *b* and *c* in Fig. 3, transmitting a corresponding movement to the controlling or cam member 79 along the shaft 39 and the parts are limited in their extreme movements by collars 110 and 111 which are secured by set screws to the rod 90 on opposite sides of the depending bracket arm 91 for coöperation therewith and to limit the movement of said rod and the parts controlled thereby.

The lever or carrier 69—78 hereinbefore referred to coöperates with the bent end 112 of the spring 113 which is secured at its opposite end to the bracket 62 by a screw 114. The spring tends to force the arm 78 of the angular lever 69—78 down into coöperation with the controlling member 79.

The ribbon 51 is or may be divided into a plurality of different fields, two being shown in the present instance. These fields are indicated at *d* and *e* and are preferably of different characteristics. The field *d*, for instance, may be red, whereas the field *e* may be black, or the lowermost field *d* may be impregnated with copying ink, whereas the upper field *e* may be impregnated with record ink or vice versa.

When the parts are adjusted to the position indicated in Figs. 1, 3 and 4 the finger piece 109 will be in the position indicated by the dotted line *a* and the cylindrical concentric portion 80 of the controlling member will be in coöperation with the arm 78 of the carrier to maintain the pivotal center 68 of the member 67 in the position shown in Fig. 4 so that the pin 71 will normally be in a position to co-act with the cam 73 at the first portion of the depression of the lever 67 in order to elevate the ribbon vibrator to a position where the lower half or field *d* of the ribbon will be presented to the action of the types. The movements of the actuating levers 67 and 58—59 bring about this movement of the vibrator as is indicated in dotted lines in Fig. 4. When, however, the finger piece 109 is shifted from the dotted line *a* to the dotted line *b* in Fig. 3 so as to bring the concentric portion 81 on the controlling member 79 into the path of the lever arm 78 as indicated in Fig. 5, then the parts will be so disposed that the pivotal center of the actuating lever 67 is changed from the dotted line position *a** to the position *b** indicated in Fig. 5. This adjustment of the finger piece 109 is effective to change the relation between the actuating levers 67 and 58—59 and to present them in the positions indicated in full lines in Fig. 5. From this figure it will be observed that the relation of the cam 73 is changed with reference to the pin 71 and that a depression of the lever 67 at this time merely effects a movement of the arm 58 from the full line to the dotted line position in Fig. 5 instead of from the full line to the dotted line position in Fig. 4, so as to bring the upper portion or black field *e* of the ribbon to a position where it will co-act with the types. When the finger piece 109 is adjusted to the position indicated by the dotted line *c*, in Fig. 3, then the eccentric or cam 82 will be brought into coöperation with the arm 78. A rotation of the shaft 39 at this time will effect a rotation of the controlling member 79 so that the eccentric or cam 82 will be turned to automatically effect a movement of the carrier or lever 69, 78 in order to vary the pivotal center of the pivot 68 of the actuating lever 67. The effect of this movement is to automatically vary the normal relation between the levers 67 and 58—59 as the carriage is fed and the ribbon is wound from one spool to an-

other. The size of the eccentric or cam 82 is such that a variation in the movement of the arm 78 will be effected from the highest portion of the cam 82, which is coincident with the cylindrical concentric face 80 of the controlling member, to the lowest portion of the cam 82, which is co-extensive with the cylindrical concentric face 81, and an automatic transverse as well as an automatic longitudinal feed of the ribbon will be effected to exhaust the ribbon both widthwise as well as longitudinally, the extent of widthwise feed corresponding to the distance between the lines of impact determined by faces 80 and 81. The impact along the ribbon under control of the cam 82 will present a wavy line which extends longitudinally thereof. This adjustment of the parts may be employed when a ribbon of a single color is used in order to fully exhaust the ribbon or it may be used for ornamental printing in different colors when a polychrome ribbon is used, the imprint being effected first in one color and then in another or partly in one color and partly in another, depending on the disposition of the cam 82 when the ribbon vibrator is actuated, it being understood that the line of impact crosses from one field *d* of the ribbon into the other field *e* thereof.

From the foregoing description it will be understood that an actuation of the handle 109 or a rotation of the cam 82 effects a shifting of the pivoted carrier 69, and the lever 67 so as to vary the normal relation between the actuating levers 67 and 58—59 and to change the pivotal center 68 of the lever 67. This change in the normal relation of the actuating levers does not affect the normal position of the lever 58—59 or the vibrator connected thereto, these parts always having the same normal position with the arm or stop 60 bearing against the under side of the top plate of the machine. The shifting movement of the lever 67 just described whether effected by the cam 82 or handle 109 is, generally speaking, a horizontal movement toward and away from the front of the machine and at substantially right angles to the movement of the lever 67 effected by an actuation of a key lever to operate the vibrator. The shifting or adjusting movement of the lever 67 as distinguished from the operating movement thereof, moves the cam edge 73 farther from or nearer to the pin 71 so as to increase or decrease the lost motion between the levers 67, 58—59 before the lever 67 takes up the lever 58—59 and the lever 67 having a substantially uniform extent of operating movement under all conditions affords a variation in the extent of throw of the ribbon vibrator. The pin 71 being normally in the lower portion of the recess 70 the lever 67 is normally free to be shifted independently of the lever 58—59 to adjust the relation be-

tween the levers; but the operating motion of the lever 67 around its pivot 68 is effective to bring the pin 71 into the narrow throat 70^a of the recess 70 at the last portion of the stroke. This is true whether the normal relation of the parts is such that the red field is in use or the black field is in use as will be understood from an inspection of the parts as shown in dotted lines in Figs. 4 and 5. The effect is also the same when the cam 82 is operative to automatically effect a transverse as well as a longitudinal feed. One of the purposes of this construction is to bring the pin 71 into the throat 70^a of the recess in all circumstances when the vibrator is actuated, to engage both of the walls 72 and 73 on opposite sides of the pin so as to cause the two levers 67, 58—59 to be interlocked or be coupled so as to prevent overthrow of the vibrator, thus insuring the interpositioning of the proper field of the ribbon in the path of the types at all times. It will be understood, however, that the arm having the curved face 72 is the prime factor in this organism for limiting the upward throw of the vibrator while at the same time permitting a further movement of the curved arm under the continued descent of the printing key without, however, changing the position to which the ribbon may have been thrown and stopped by said arm. Moreover, after the pin 71 is in the throat 70^a any variation in the point of arrest of the universal bar does not effect a variation in the extent of upward movement of the vibrator as the walls of the throat contact with the pin 71 and a movement of the lever 67 at this time does not effect a movement of the vibrator but on the contrary it is held at a given point against overthrow or further movement, notwithstanding the universal bar and lever 67 may have a further movement after the vibrator has reached the given point in question. It will thus be seen that the vibrator actuating means includes self-contained means for limiting the throw of the vibrator.

I have illustrated the modified form of construction in Figs. 7, 8, 9 and 10 wherein the carrier 69^a has a projection 115 for co-operation with a bent end of a spring 116 secured to a bracket by a screw 117 and projecting through an opening 118 of the bracket plate for coöperation with the carrier 69^a. Instead of the carrier itself co-operating with the controlling member as in the construction previously described, the actuating lever 67^a co-acts directly with the controlling device 79^a. The contact face 119 of the actuating lever 67^a, with which the controlling member coöperates, is in an arc of which the pivot 68^a is the center, so that a vibration of the lever 67^a may at all times be effected without being obstructed or interfered with by the controlling mem-

ber 79^a and without throwing the engaging face 119 out of coöperation with said controlling member. In this construction the change in the relation between the actuating lever 67^a and the pin 71^a and the actuating lever such as the lever 58—59 which carries it is effected in essentially the same manner as that hereinbefore described. In the present construction, however, there are four faces provided on the controlling member 79^a, three faces 80^a, 81^a and 82^a corresponding to the faces 80, 81 and 82 hereinbefore described. In addition to these faces a fourth cylindrical concentric face 120 is provided which is of smaller radii than any of the others and when the engaging edge 119 of the actuating lever 67^a is brought into coöperation therewith as shown in Fig. 10, a downward movement of the lever 67^a, effected by the depression of a printing key, will merely result in moving the lever 67 without transmitting movement to the pin 71^a and the lever which carries it; so that at this time the pin passes idly into the throat of the recess without coöperating with the cam 73^a and said pin, the lever which carries it and the ribbon vibrator remain at rest out of the path of the types so that mimeograph sheets may be prepared on the machine. When the controlling member 79^a is adjusted to the position shown in Fig. 9 to bring the face 81^a thereof into coöperation with the engaging edge 119 of the actuating lever 67^a, then the ribbon vibrator will be moved to a position where the uppermost or black field *e* of the ribbon will be presented for coöperation with the types. When the controlling member 79^a is adjusted longitudinally of the shaft 39 to the position shown in Fig. 8 where the cylindrical face 80^a is in a position to coöperate with the engaging face 119 of the actuating lever, then a greater extent of throw of the ribbon vibrator will be effected on the depression of the actuating lever 67^a and the lowermost or red field of the ribbon will be brought to the path of the types.

From the foregoing description it will be understood that I have provided simple and efficient means for automatically varying the widthwise portion of the ribbon which is presented to the types in order to exhaust the ribbon widthwise as well as longitudinally; that I have also provided hand controlled means operable at will to render said automatic means operative or inoperative; or operable at will to render any one of a number of different fields of the ribbon operative; or operable at will to render the ribbon vibrating mechanism inoperative to move the vibrator to the operative position so that mimeograph sheets may be prepared.

Various changes may be made without departing from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of a ribbon vibrator, an actuating lever which turns on a fixed pivot and which is connected with said vibrator, a pivoted actuating device for said lever, and means for shifting the pivotal center of said pivoted actuating device to effect a change in the throw of said vibrator.

2. In a typewriting machine, the combination of a ribbon vibrator having a single normal position, devices including two levers for actuating said vibrator, and means independent of the operation of the machine for varying the normal angle between said levers to change the action of one of said levers on the other and vary the extent of throw of said vibrator.

3. In a typewriting machine, the combination of a ribbon vibrator having a single normal position, two levers operable one on the other and on said vibrator to operate it at each printing operation, and means independent of the operation of the machine for varying the normal angle between said levers to change the action of one on the other and thus vary the extent of throw of said vibrator.

4. In a typewriting machine, the combination of a ribbon vibrator, two levers operable one on the other and on said vibrator to operate it, and means for varying the normal and effective relation between said levers to render one of said levers inoperative on the other.

5. In a typewriting machine, the combination of a ribbon vibrator, levers operable one on the other and on said vibrator to operate it, and hand controlled means operable to vary at will the normal and effective relation between said levers to vary the throw of said ribbon vibrator or to render one lever inoperative on the other, so as to render the levers inoperative to actuate the vibrator.

6. In a typewriting machine, the combination of a ribbon vibrator, two levers operable one on the other and on said vibrator to operate it, and hand controlled means operable to vary at will the pivotal center of one of said levers and thereby change the relation between said levers, to vary the throw of the vibrator.

7. In a typewriting machine, the combination of a ribbon vibrator, two levers operable one on the other and on said vibrator to operate it, and hand controlled means operable to vary at will the pivotal center of one of said levers and thereby changing the relation between said levers, to vary the throw of the vibrator or to throw one lever out of coöperation with the other when desired to render them inoperative to actuate the vibrator.

8. In a typewriting machine, the combi-

nation with printing keys, and printing instrumentalities controlled thereby, of a ribbon vibrator, an actuating lever to which said vibrator is connected, a second actuating lever co-acting with the first mentioned lever to actuate it, a pivoted carrier to which said second actuating lever is pivoted, operating means connected with said second actuating lever and controlled by an operation of any of said printing keys, and independent means for shifting said carrier.

9. In a typewriting machine, the combination with printing keys, and printing instrumentalities controlled thereby, a ribbon vibrator, an actuating lever to which said vibrator is connected, a second actuating lever co-acting with the first mentioned lever to actuate it, a pivoted carrier to which said second actuating lever is pivoted, operating means connected with said second actuating lever and controlled by an operation of any of said printing keys, and independent hand actuated means operable at will to shift said carrier to change the relation between said actuating levers.

10. In a typewriting machine, the combination with printing keys, and printing instrumentalities controlled thereby, of a ribbon vibrator, an actuating lever to which said vibrator is connected, a second actuating lever co-acting with the first mentioned lever to actuate it, a pivoted carrier to which said second actuating lever is pivoted, operating means connected with said second actuating lever and controlled by an operation of any of said printing keys, and independent hand actuated means operable at will to shift said carrier to change the relation between said actuating levers in order to change the throw of the ribbon vibrator or to render one of said levers inoperative on the other.

11. In a typewriting machine, the combination with printing keys, and printing instrumentalities controlled thereby, of a ribbon vibrator, an actuating lever to which said vibrator is connected, a second actuating lever co-acting with the first mentioned lever to actuate it, a pivoted carrier to which said second actuating lever is pivoted, operating means connected with said second actuating lever and controlled by an operation of any of said printing keys, and automatically actuated means coöperative with said carrier to shift it.

12. In a typewriting machine, the combination with printing keys, and printing instrumentalities controlled thereby, of a ribbon vibrator, an actuating lever to which said vibrator is connected, a second actuating lever co-acting with the first mentioned lever to actuate it, a pivoted carrier to which said second actuating lever is pivoted, operating means connected with said second

actuating lever and controlled by an operation of any of said printing keys; and automatically actuated means coöperative with said carrier to shift it and the actuating lever carried thereby in order to vary the relation between said actuating levers and thereby change the throw of the ribbon vibrator.

13. In a typewriting machine, the combination with printing keys, and printing instrumentalities controlled thereby, of a ribbon vibrator, an actuating lever to which said vibrator is connected, a second actuating lever co-acting with the first mentioned lever to actuate it, a pivoted carrier to which said second actuating lever is pivoted, operating means connected with said second actuating lever and controlled by an operation of any of said printing keys, automatically actuated means coöperative with said carrier to shift it and the actuating lever carried thereby in order to vary the relation between said actuating levers and thereby change the throw of the ribbon vibrator, and hand controlled means operable at will to vary the relation between said levers and thereby vary the throw of the ribbon vibrator.

14. In a typewriting machine, the combination of a ribbon vibrator, an actuating lever connected therewith, a second actuating lever coöperative with said first mentioned lever, a pivoted carrier for said second actuating lever, and a cam for controlling the pivotal center of said carrier.

15. In a typewriting machine, the combination of a ribbon vibrator, an actuating lever connected therewith, a second actuating lever coöperative with said first mentioned lever, a pivoted carrier for said second actuating lever, a cam for controlling the pivotal center of said carrier, and hand actuated means operable at will for varying the position of said cam relatively to said carrier in order to vary the throw of the vibrator.

16. In a typewriting machine, the combination of a ribbon vibrator, an actuating lever connected therewith, a second actuating lever coöperative with said first mentioned lever, a pivoted carrier for said second actuating lever, a cam for controlling the pivotal center of said carrier, and automatically actuated means for operating said cam.

17. In a typewriting machine, the combination of a ribbon vibrator, an actuating lever connected therewith, a second actuating lever coöperative with said first mentioned lever, a pivoted carrier for said second actuating lever, a cam for controlling the pivotal center of said carrier, and thereby varying the throw of the ribbon vibrator, hand actuated means operable at will to

vary said cam relatively to said carrier, and automatically actuated means for operating said cam.

18. In a typewriting machine, the combination of a ribbon vibrator, an actuating member therefor, a cooperative actuating member, one of the actuating members having a recess to receive the other and afford a lost motion between the members, and means for varying the relation between said members while the vibrator is in the normal position in order to predetermine the extent of throw of the vibrator during printing operations.

19. In a typewriting machine, the combination of a ribbon vibrator, an actuating member therefor, a cooperative actuating member, one of the actuating members having a recess to receive the other and being constructed to operate on the other to take it up at different points in the travel of the first member, and hand controlled means operable at will for varying the relation between said members to determine at what part in the movement of one member the other will be taken up, in order to vary the throw of the vibrator.

20. In a typewriting machine, the combination of a ribbon vibrator, an actuating member therefor, a cooperative actuating member, one of the actuating members having a recess to receive the other and affording a lost motion between the members, and automatically actuated means for varying the relation between said members to determine at what part in the movement of one member the other will be taken up, in order to vary the throw of the vibrator.

21. In a typewriting machine, the combination of a ribbon vibrator, an actuating member therefor, a cooperative actuating member, one of the actuating members having a recess to receive the other and affording a lost motion between the members, hand controlled means operable at will for varying the relation between said members to determine at what part in the movement of one member the other will be taken up, in order to vary the throw of the vibrator, and automatically actuated means for varying the relation between said members.

22. In a typewriting machine, the combination of key levers, a ribbon vibrator that has a single normal position, an actuating lever therefor, a cooperative actuating lever, one of the actuating levers having a recess which contains always a part of the other lever and affords a lost motion between the levers, a universal bar, connections between said universal bar and said pair of actuating levers, and hand controlled means operable at will for varying the relation between said levers to determine the amount of said lost motion or to render one of said levers inoperative on the other.

23. In a typewriting machine, the combination of a ribbon vibrator, a vibratory member for actuating said vibrator, a second vibratory member, a cam on one of said vibratory members cooperative with and receiving a movement relative to the other vibratory member at each printing movement, to effect a movement of one part by the other through a camming action, and means for changing the normal relation between said cam and the vibratory member with which it cooperates.

24. In a typewriting machine, the combination of a ribbon vibrator, a vibratory member for actuating said vibrator, a second vibratory member, a cam on one of said vibratory members cooperative with the other vibratory member to actuate it by a camming action at printing operation, and hand controlled means operable at will for changing the normal relation between said cam and the vibratory member with which it cooperates so as to regulate the action of the cam in order to change the throw of the vibrator.

25. In a typewriting machine, the combination of a ribbon vibrator, a vibratory member for actuating said vibrator, a second vibratory member, a cam on one of said vibratory members cooperative with the other vibratory member, and automatically actuated means for changing the normal relation between said cam and the vibratory member with which it cooperates, in order to change the throw of the vibrator.

26. In a typewriting machine, the combination of a ribbon vibrator, a vibratory member for actuating said vibrator, a second vibratory member, a cam on one of said vibratory members cooperative with the other vibratory member to move it by a camming action at printing operations, and hand controlled means operable at will for changing the normal relation between said cam and the vibratory member with which it cooperates, in order to change the throw of the vibrator, or to render one of said vibratory members inoperative on the other and then render the vibrator inoperative.

27. In a typewriting machine, the combination of a ribbon vibrator, an actuating member therefor, a second actuating member cooperative with the first named member but movable independently thereof at the beginning of the stroke, a stop on one of said members to prevent overthrow, and means for varying the normal relationship between said members.

28. In a typewriting machine, the combination of a ribbon vibrator, an actuating member therefor, a second actuating member cooperative with the first-named member but movable independently thereof at the beginning of the stroke, a stop on one of said members to prevent overthrow, and

hand operated devices for varying at will the normal relationship between said members.

29. In a typewriting machine, the combination of a ribbon vibrator, an actuating member therefor, a second actuating member coöperative with said first mentioned member, means whereby said second actuating member is capable of an actuating movement independently of the first mentioned actuating member at the initial portion of the stroke and engages therewith at a subsequent portion of the stroke so that both of said members are compelled to move together for a certain distance whereupon the first member becomes stationary while the second may continue its movement, and automatically actuated means for varying the normal relation between said members.

30. In a typewriting machine, the combination of a ribbon vibrator, actuating means therefor, and controlling means for said actuating means, said controlling means comprising a cam member shiftable at will to determine whether one or another longitudinal field of the ribbon shall be presented to the printing point, or whether or not the actuating means shall be rendered inoperative to move the vibrator.

31. In a typewriting machine, the combination of a ribbon vibrator, actuating means therefor, and controlling means for said actuating means, said controlling means comprising a cam member shiftable at will to determine whether one or another longitudinal field of the ribbon shall be presented to the printing point or whether or not the actuating means shall be rendered inoperative to move the vibrator or whether or not a transverse feed of the ribbon shall be effected during the longitudinal feed thereof.

32. In a typewriting machine, the combination of a ribbon vibrator, a pair of co-acting levers for actuating said vibrator, and means for varying the normal relation between said levers, said means comprising a shiftable member having a cam face and a plurality of concentric faces.

33. In a typewriting machine, the combination of a ribbon vibrator, a pair of co-acting levers for actuating said vibrator, and means for varying the normal relation between said levers, the varying means comprising a rotative member having a cam face and a plurality of cylindrical concentric faces, and hand actuated means operable at will to shift said rotative member in order to bring any of said faces into operative position.

34. In a typewriting machine, the combination of a ribbon vibrator, a pair of co-acting levers for actuating said vibrator, and means for varying the normal relation between said levers, the varying means com-

prising a rotative member having a cam face and a plurality of cylindrical concentric faces of different radii, and hand actuated means operable at will to shift said member in order to bring any of said faces into operative position, one of said cylindrical concentric faces controlling the normal relation between said levers to give one throw to the vibrator to write within one field of the ribbon, another of said cylindrical concentric faces controlling the relation between said levers to give another throw to the vibrator to write within another field of the ribbon and a third cylindrical concentric face controlling the normal relation between said levers to render one inoperative on the other.

35. In a typewriting machine, the combination of a ribbon vibrator, a pair of co-acting levers for actuating said vibrator, and means for varying the normal relation between said levers, the varying means comprising a member having a plurality of differently acting faces, hand actuated means operable at will to shift said member to bring any of said faces into operative position, one of said faces controlling the normal relation between said levers to render one inoperative on the other, and a detent for said member.

36. In a typewriting machine, the combination of key levers, a ribbon vibrator, a pair of levers one acting directly on the other to transmit motion to said vibrator, a universal bar, a connecting link between said universal bar and said levers, and hand actuated means operable at will for throwing said levers out of coöperative relation with each other.

37. In a typewriting machine, the combination of a ribbon vibrator, a pair of actuating levers operative one on the other to transmit motion to the vibrator, a pivoted carrier for one of said levers, and means for shifting one of said levers and its pivoted carrier to change the normal relation between said levers.

38. In a typewriting machine, the combination of a ribbon vibrator, two coöperative actuating members therefor and through which motion is transmitted to the ribbon vibrator, one of said actuating members having a recess with side walls disposed at an angle to one another, a pin on the other of said members, said pin entering said recess, and means for effecting a relative adjustment between said members.

39. In a typewriting machine, the combination of a ribbon vibrator, two coöperative actuating members therefor and through which motion is transmitted to the ribbon vibrator, one of said actuating members having a recess with side walls disposed at an angle to one another, a pin on the other of said members, said pin entering said re-

cess, and hand controlled means operable at will for effecting a relative adjustment between said members, the relative adjustment between said members effected by said hand controlled means being in one direction and the transmitting movement for actuating the vibrator being in another direction at substantially right angles to said first mentioned adjustment or movement.

40. In a typewriting machine, the combination of a ribbon vibrator, two coöperative actuating members therefor and through which motion is transmitted to the ribbon vibrator, one of said actuating members having a recess with side walls disposed at an angle to one another, a pin on the other of said members, said pin entering said recess, and hand controlled means operable at will for effecting a relative adjustment between said members in the normal positions thereof to vary the throw of the ribbon vibrator or to render one lever inoperative on the other when desired, the relative adjustment or movement between said levers effected by said hand controlled means being in one direction and the transmitting movements for actuating the vibrator being in another direction at substantially right angles to said first mentioned movement.

41. In a typewriting machine, the combination of a ribbon vibrator, a plurality of levers operable one on another to transmit motion to said ribbon vibrator, a rotary member having a plurality of controlling faces thereon, and hand operated means operable at will to move said member transversely of said levers to bring any controlling face on said rotary member into operative position to control the normal relation between said levers.

42. In a typewriting machine, the combination of a ribbon vibrator, a universal bar, two levers interposed between the universal bar and vibrator and operable one on the other to transmit motion from the universal bar to said vibrator, and hand controlled means operable at will and independently of the operation of the machine to vary the normal and effective relation between said levers so as to vary the action of one on the other and thereby control the operation of the vibrator.

43. In a typewriting machine, the combination of a ribbon vibrator, a universal bar, two levers interposed between the universal bar and vibrator, said levers being disconnected one from the other but operable one on the other to transmit motion from the universal bar to said vibrator, and hand controlled means operable at will to vary the normal relation between said levers to vary the time that one lever is taken up by the other.

44. In a typewriting machine, the combi-

nation of a ribbon vibrator, two loosely connected levers operable one on the other to transmit motion to the ribbon vibrator, and means for varying the normal relation between said levers to vary the time that one lever is taken up by the other.

45. In a typewriting machine, the combination of a ribbon vibrator, two loosely connected levers operable one on the other to transmit motion to the ribbon vibrator, and hand controlled means operable at will for varying the normal relation between said levers to vary the time that one lever is taken up by the other and thus vary the throw of the vibrator or for rendering one lever inoperative to move the other.

46. In a typewriting machine, the combination of a ribbon vibrator, two loosely connected levers operable one on the other to transmit motion to the ribbon vibrator, and hand controlled means operable at will for varying the normal relation between said levers to render one of said levers inoperative on the other.

47. In a typewriting machine, the combination of a ribbon vibrator, two loosely connected levers operable one on the other to transmit motion to the ribbon vibrator and coöperative one with the other during the movement thereof to positively connect one lever to the other so that one lever is held against overthrow by the other, and means for varying the normal relation between said levers.

48. In a typewriting machine, the combination of a ribbon vibrator, two loosely connected levers operable one on the other to transmit motion to the ribbon vibrator, and coöperative one with the other during the movement thereof to positively connect one lever to the other so that one lever is held against overthrow by the other, and hand controlled means operable at will to vary the normal relation between said levers or to render one inoperative on the other when desired.

49. In a typewriting machine, the combination of a ribbon vibrator, two actuating levers operable one on the other to transmit motion to said ribbon vibrator, one of said levers being connected with the vibrator and the other pivoted to a supporting lever, and means for shifting said supporting lever and the actuating lever pivoted thereto to change the normal relation between said actuating levers.

50. In a typewriting machine, the combination of a ribbon vibrator, two loosely connected actuating levers operable one on the other to transmit motion to said ribbon vibrator one of said levers being connected with the vibrator and the other pivoted to a supporting lever, the construction and arrangement of said actuating levers being

such that one may move independently of the other in the normal positions thereof but which are coöperative at the last portion of the actuating movement to couple one to prevent overthrow of one lever by the other, and means for shifting said supporting lever and the actuating lever pivoted thereto to change the normal relation between said actuating levers.

51. In a typewriting machine, the combination of a ribbon vibrator, a plurality of actuating levers operable one on another to transmit movement to said ribbon vibrator ribbon spools, a shaft for driving the ribbon spools, and means operatively connected with said shaft for changing the normal relation between said levers.

52. In a typewriting machine, the combination of a ribbon vibrator, a plurality of actuating levers operable one on another to transmit movement to said ribbon vibrator ribbon spools, a shaft for driving the ribbon spools, and hand controlled means operable at will and operatively connected with said shaft for changing the normal relation between said levers.

53. In a typewriting machine, the combination of a ribbon vibrator, a plurality of actuating levers operable one on another to transmit movement to said ribbon vibrator, ribbon spools, a shaft for driving the ribbon spools, shifting means for shifting one of said levers relatively to the other to change the normal relation between them, said shifting means comprising automatically actuated means controlled by said shaft, and hand controlled means operable at will.

54. In a typewriting machine, the combination of a ribbon vibrator, an actuating lever therefor, a second actuating lever co-operative with said first mentioned actuating lever, the first mentioned lever acting against a dead center on the fulcrum of the second lever at the last part of the throw of the vibrator, and means for changing the throw of the vibrator.

55. In a typewriting machine, the combination of a ribbon vibrator, an actuating lever therefor, a second actuating lever co-operative with said first mentioned actuating lever, the first mentioned lever acting against a dead center on the fulcrum of the second lever at the last part of the throw of the vibrator, and hand controlled means operable at will to vary the fulcrum of the

second lever to change the relation between said levers.

56. In a typewriting machine, the combination of a ribbon vibrator, a pair of co-operating actuating levers, and a stop on one of said levers for limiting the movement of the other lever.

57. In a typewriting machine, the combination of a ribbon vibrator, and actuating means therefor including a movable actuating part provided with a stop for limiting the movement of the vibrator at printing operation.

58. In a typewriting machine, the combination of a ribbon vibrator, a train of actuating devices therefor including a pair of loosely connected levers, and a stop on one lever engageable by the other lever to limit the movement of said other lever and of the vibrator.

59. In a typewriting machine, the combination of a paper carriage, a ribbon vibrator, actuating means therefor, means for varying said actuating means, and a stop controlled by said actuating means and its varying means so that said stop is varied during movements of the carriage.

60. In a typewriting machine, the combination of a ribbon vibrator, actuating means therefor, means for varying said actuating means, and a stop for said ribbon vibrator, said stop being controlled by said actuating means and its varying means and operative both automatically and by hand.

61. In a typewriting machine, the combination of a ribbon vibrator, actuating means therefor, automatic means for varying said actuating means, and a stop automatically controlled by said actuating means and its varying means.

62. In a typewriting machine, the combination of a ribbon vibrator, actuating means therefor, means operative at will either automatically or by hand for varying said actuating means, and a stop controlled by said actuating means and its varying means and operative at will either automatically or by hand.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 3rd day of August A. D. 1907.

EDWIN E. BARNEY.

Witnesses:

W. C. HAY,

C. A. WATERBURY.