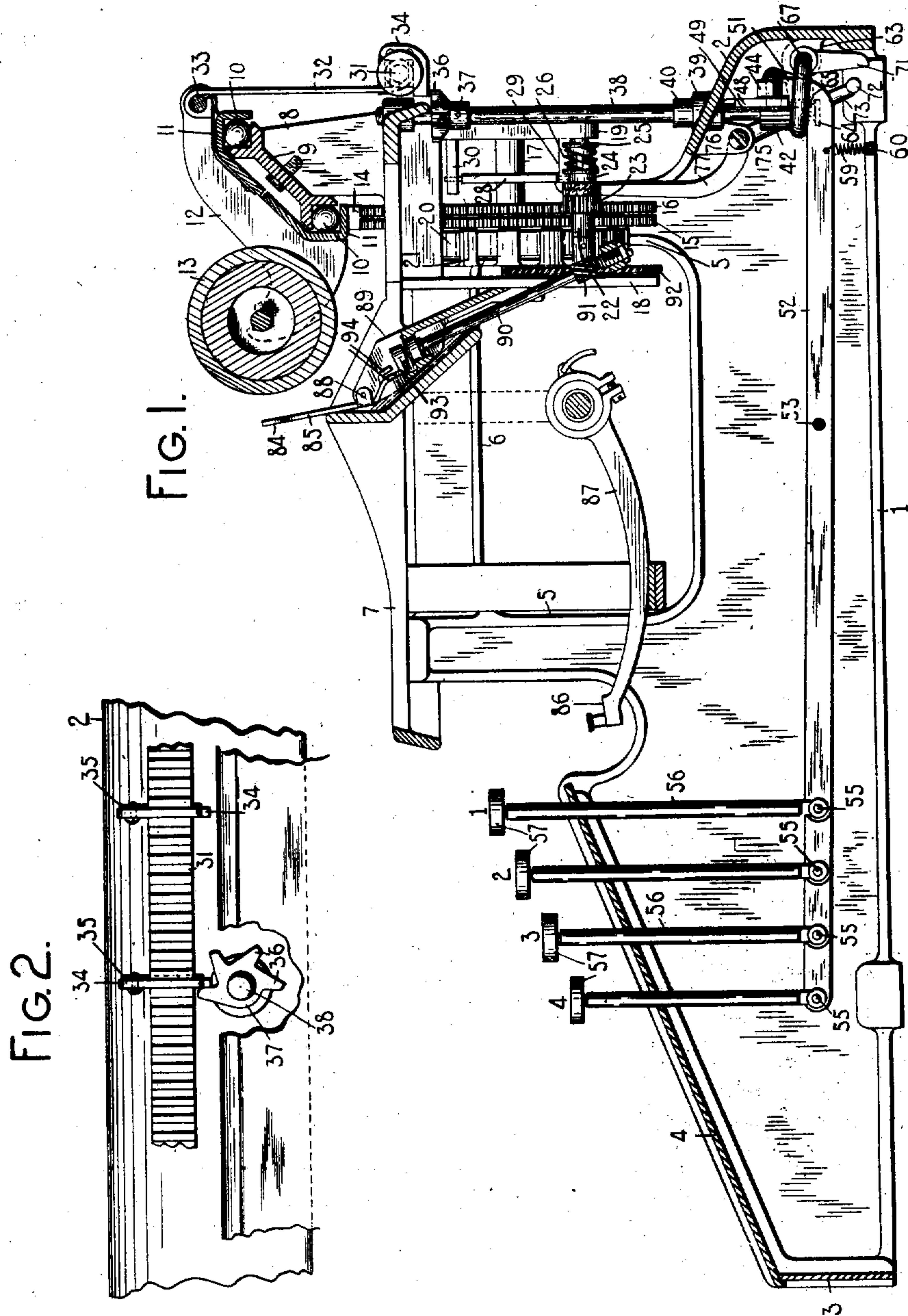


975,110.

J. H. BARR.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 27, 1906.

Patented Nov. 8, 1910.

3 SHEETS—SHEET 1.



WITNESSES:

M. J. Hannweber
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INVENTOR

John H. Barr

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James F. Barr

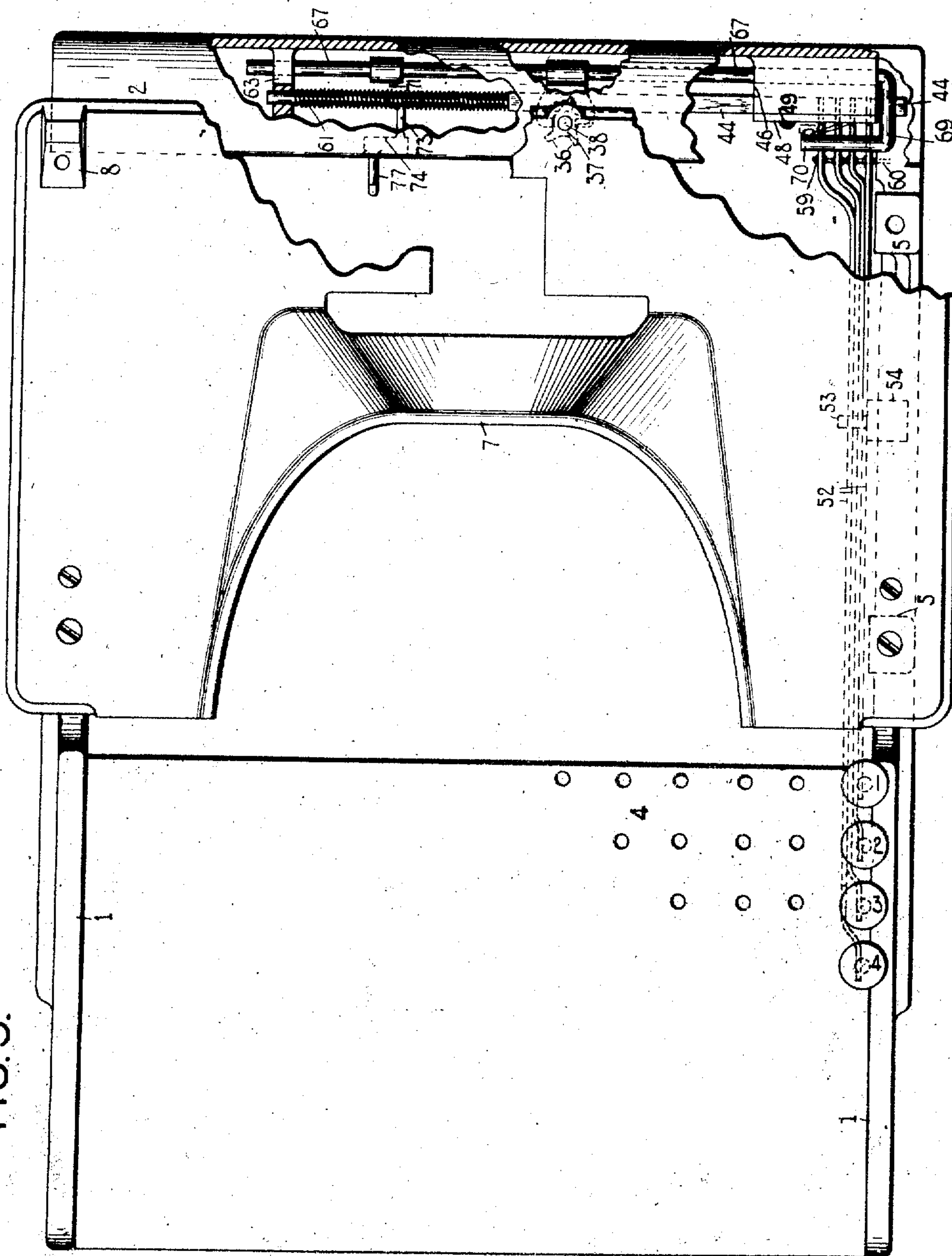
ATTORNEY

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Patented Nov. 8, 1910.
3 SHEETS—SHEET 2.

FIG. 3.



WITNESSES:

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3 SHEETS-SHEET 3.

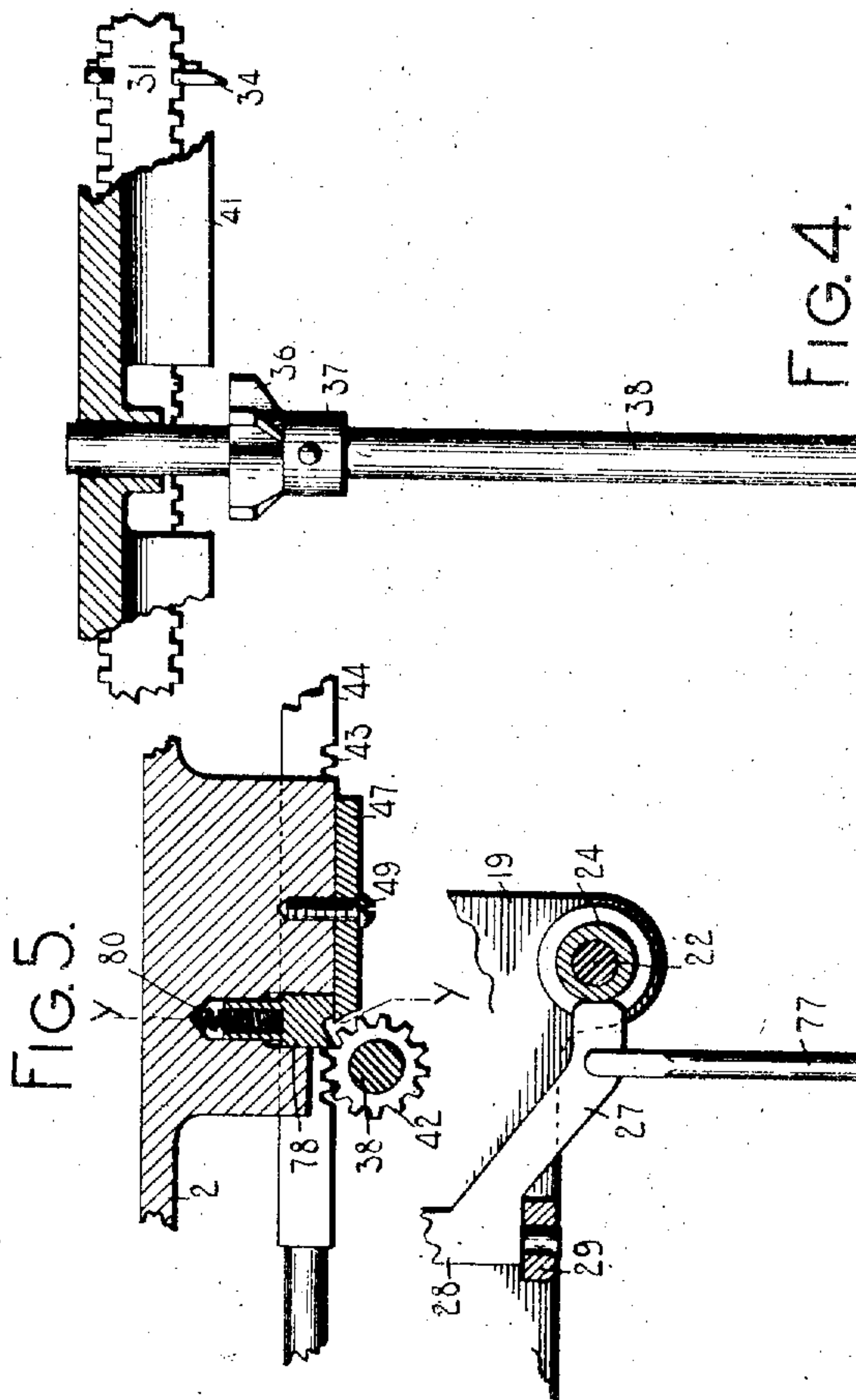
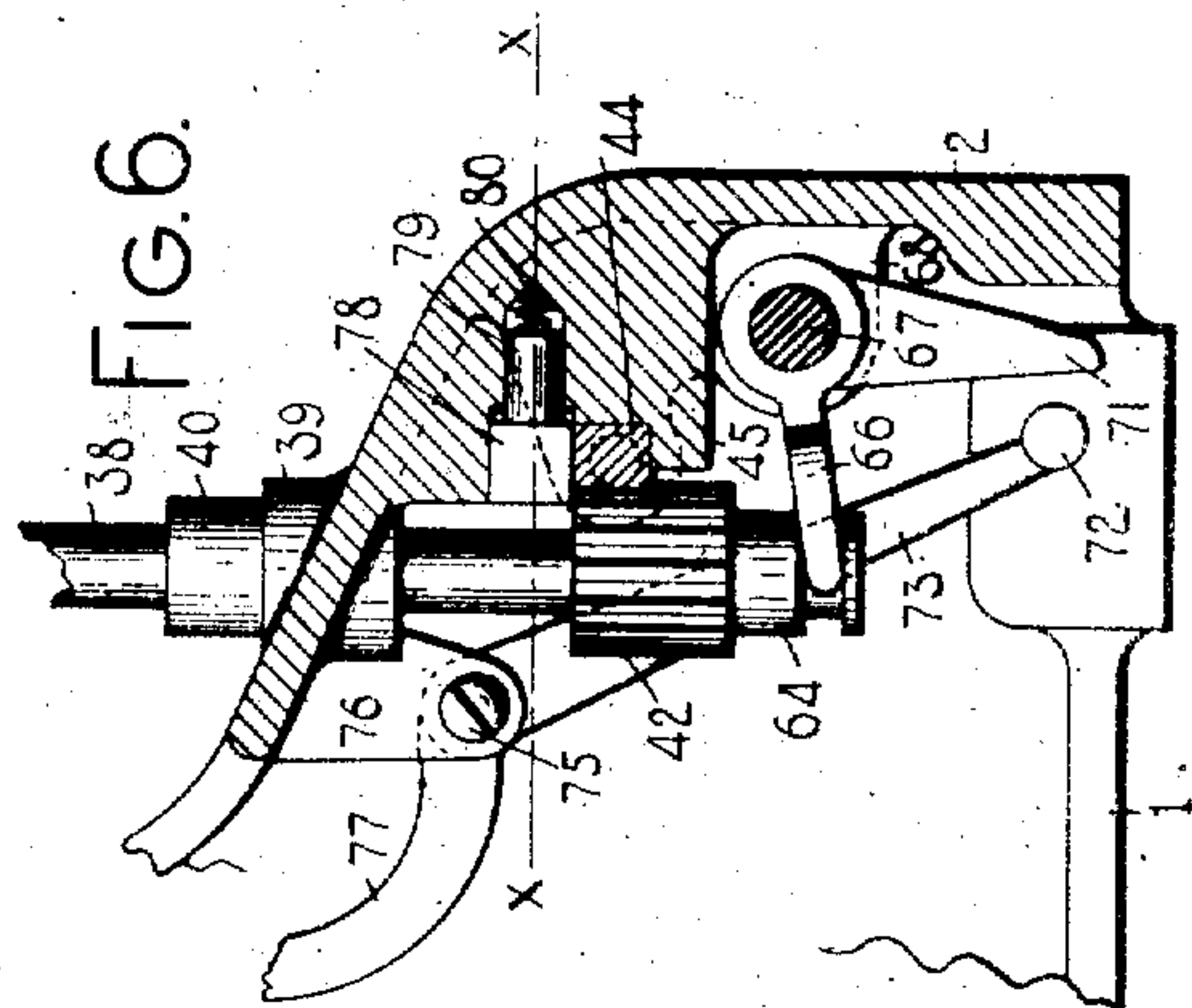
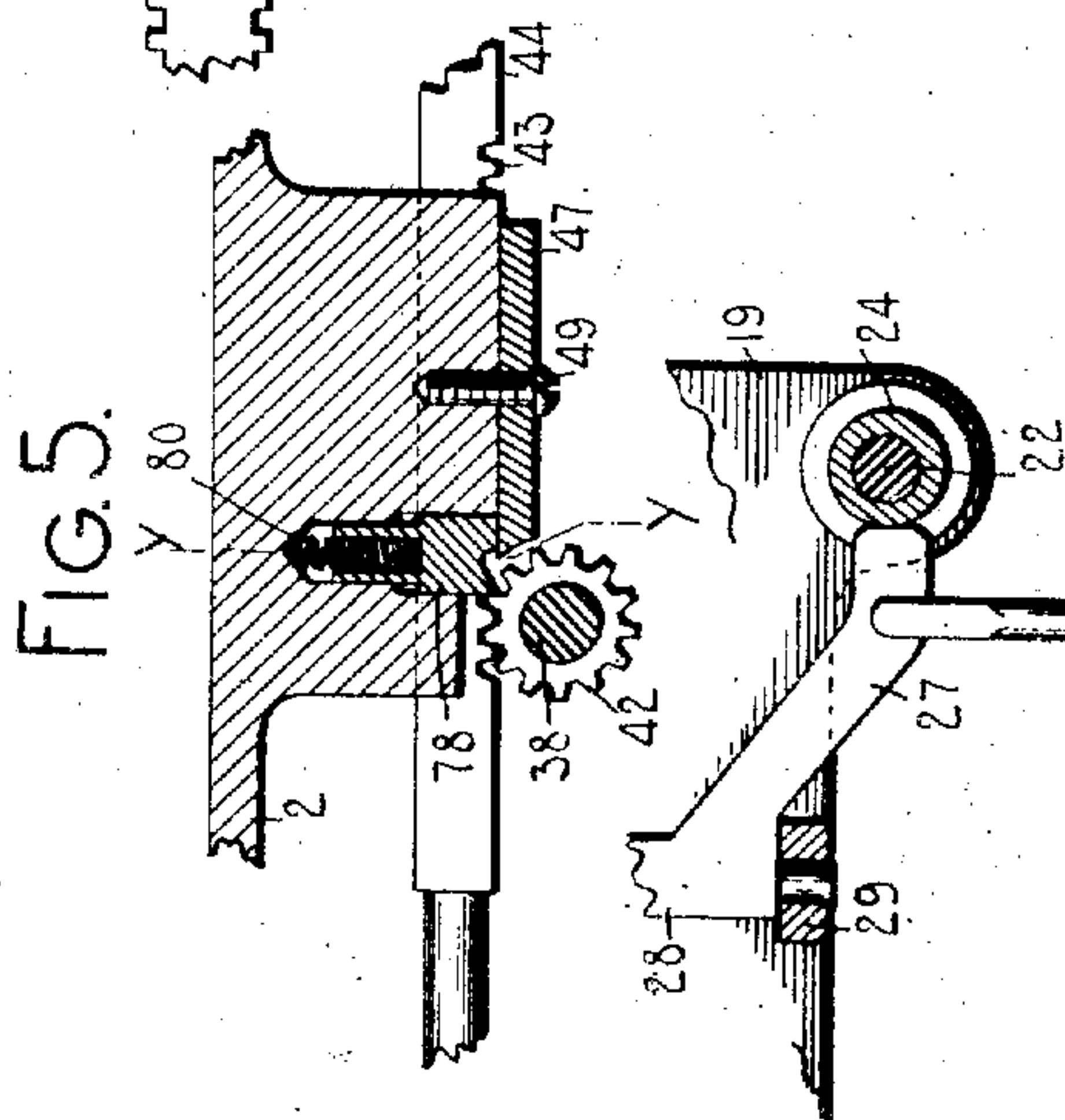
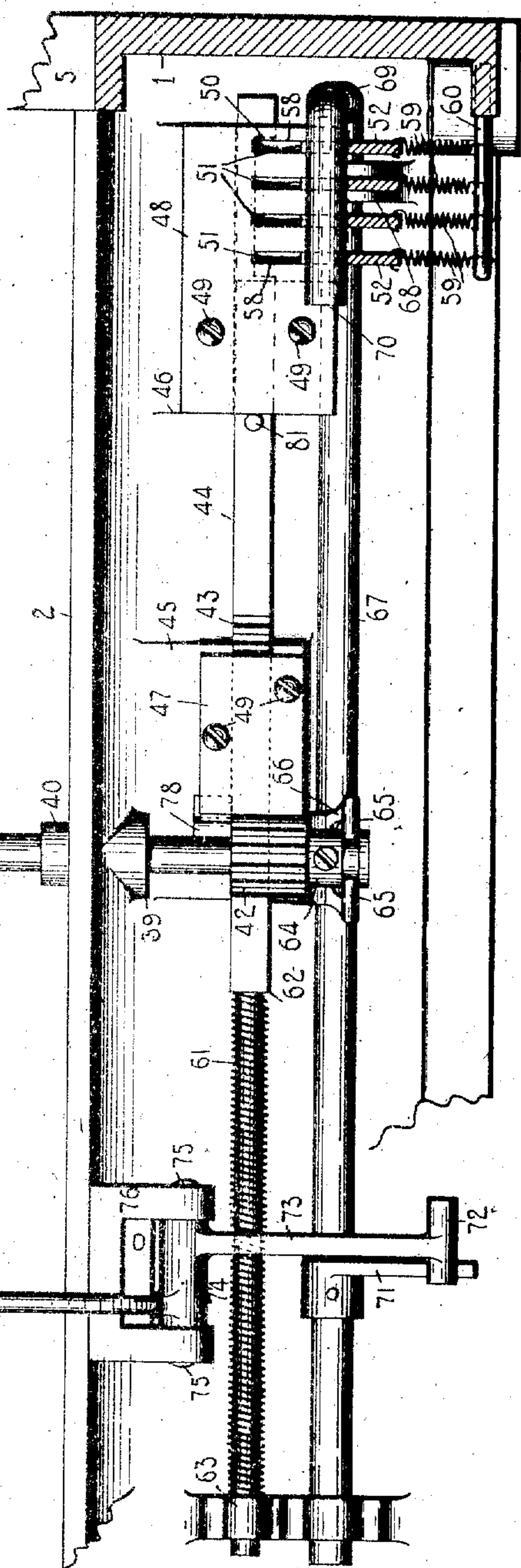


FIG. 5.



WITNESSES:

M. F. Kammweller
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UNITED STATES PATENT OFFICE.

JOHN H. BARR, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE SMITH PREMIER TYPE-WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

975,110.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed April 27, 1906. Serial No. 314,027.

To all whom it may concern:

Be it known that I, JOHN H. BARR, 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 especially to tabulating mechanism for such machines.

My invention has for its principal object to provide an improved "column jumper," or means for quickly and conveniently bringing the carriage to any selected one of a plurality of column positions, intermediate column positions being skipped or passed, if desired.

In the accompanying drawings, Figure 1 is a front to rear vertical sectional view of a typewriting machine having my invention embodied therein, the section being taken just inside the right-hand side plate. Fig. 2 is a fragmentary top plan view of part of the mechanism. Fig. 3 is a top plan view of the machine. Fig. 4 is a fragmentary front elevation of part of the mechanism, parts of the main frame being shown in vertical section. Fig. 5 is a view of part of the mechanism in horizontal section on the line $x-x$ of Fig. 6. Fig. 6 is a fragmentary view of part of the mechanism in vertical section substantially on a line $y-y$ of Fig. 5.

In the several views I have shown only so much of a typewriting machine as is necessary to illustrate my invention and parts have been omitted or broken or shown in section as has been found convenient.

My invention is applicable to typewriting machines generally. The main frame of the machine shown in the drawings comprises side plates 1 that are connected together at the rear by a back plate 2 and at the front of the machine by a front plate 3 and a keyboard 4. Each of said side plates is formed or provided with posts 5 which are connected together near their upper ends by ties 6 and which support a top plate 7. Posts or brackets 8 rising from said top plate support a stationary carriage rail 9 having formed in its opposite edges grooves or race ways for anti-friction balls or rollers 10 which cooperate with rails 11 of a carriage.

Said carriage comprises end pieces 12 in which is pivoted the shaft of a roller platen 13. The carriage rail 9 is inclined downward toward the front of the machine at an angle of about 45° . The lower forward rail 11 has secured thereto a feed rack 14 that meshes with two gear wheels 15 and 16 both loosely mounted on a shaft 17 which is journaled at its front and rear ends respectively in frame plates 18 and 19 depending from the top plate 7. The gear wheel 15 is operatively connected in any suitable manner with a spring 20 coiled within a barrel or drum 21 which is also mounted on the shaft 17; and this spring acting through said gear wheel 15 drives the carriage in letter space feed direction.

The motion of the carriage under the impulse of the spring 20 is controlled by any suitable escapement mechanism comprising an escapement wheel geared to a shaft 22 which is journaled at its ends in the frame plates 18 and 19. Said shaft has mounted thereon a pinion 23 with freedom to rotate on the shaft but held against motion longitudinally of said shaft, said pinion meshing with the gear wheel 16. Said pinion 23 or its hub has its rear face formed with ratchet clutch teeth that are adapted to mesh with like teeth formed on the forward end of a collar 24 that is loosely mounted on the shaft 22 and the rear end of which is connected by a tooth and slot connection with a collar 25 that is fast on or integral with the shaft 22. The collar 24 is yieldingly pressed into engagement with the hub of the pinion 23 by a spring 26 compressed between flanges of the collars 25 and 24. The construction is such that when the shaft 22 is held against rotation the carriage is held against motion under the impulse of the spring 20; but, if the carriage be moved toward the right, the ratchet clutch teeth on the pinion 23 and the collar 24 slip past one another.

In order to release the carriage from its escapement mechanism it is only necessary to force the collar 24 toward the rear of the machine against the tension of its spring 26. To this end said collar is formed with a peripheral groove into which extends the end of an arm 27 of a vertically disposed rocking member 28 that is pivoted at its ends in brackets 29 and 30 projecting to-

ward the front of the machine from the frame plate 19. It will be evident that if the arm 27 be pressed toward the rear of the machine the carriage will be released from its escapement mechanism.

A column stop bar 31 is mounted on the carriage, being suspended by arms 32 from a rod 33 that joins the side plates 12 of the carriage near the upper rear ends of said plates. The arms 32 hang substantially vertical and the stop bar 31 is situated just back of and nearly on a level with the top plate 7. Said stop bar 31 is formed on its upper and lower faces with transverse notches a letter space distance apart and column stops 34 are adapted to be mounted on said stop bar. Said column stops are of furcated construction and are adapted to be slipped on to the bar from the rear, the forks of the stops embracing said bar and fitting into the notches formed in said bar. As shown in the present instance, each of said stops has riveted to one side thereof a plate spring 35 that is adapted to enter the notch on the lower side of the bar and by its resiliency to cause a frictional engagement between the stop and the edge of the notch so as to prevent accidental displacement of the stop from its position on the bar. Each of the stops 34 has its lower fork or arm projecting toward the front of the machine slightly in advance of the bar 31 and these projecting arms are adapted to come into engagement with stop arms or teeth 36 projecting from a rotary toothed stop member 37 that is rigidly mounted on a vertical shaft 38, the upper end of which is journaled in the top plate 7 and the lower end of which projects through the back plate 2 and is journaled in a bearing 39 secured to said back plate.

In the operation of the machine this toothed stop member is opposed to the column stops 34 and in some of the claims I have accordingly referred to said column stops as tabulator stops and to the rotary stop member as a counter-stop. Inasmuch as this counter-stop comprises a plurality of arms or teeth, each of which in itself is a stop, I have also in some of the claims referred to said rotary stop member as a compound counter-stop and in some of the claims I have also referred to said stop arms or teeth as a set of counter-stops. I do not mean these expressions, however, to limit said claims to the precise form of counter-stop or set of counter-stops shown in this case, but I regard the combinations recited in the claims referred to as being novel without other limitations than those distinctly recited in said claims. In the specific form of the invention shown in the drawing it will be observed that all of the stop arms or teeth 36 would have their faces cut by a plane at right angles to their axis

of rotation, that is to say, to the axis of the vertical shaft 38, and some of the claims are limited to a construction in which the faces of the different stops have this relation; but for some of the purposes of my invention it is not necessary that the faces of said stops be thus related. As far as I am aware it is broadly new to provide a plurality of carriage stops each mounted on a rotary member that is rotated by the carriage to bring one or another of said stops to operative position, whether or not said stops be situated on the rotary member in such relative positions that a plane at right angles to the axis of said rotary member would intersect the faces of the stops. It will also be observed that the faces of these several stops 36 lie in planes that intersect one another. In the present instance these planes intersect substantially in the axis of the shaft 38.

The column stops or tabulator stops 34 and the counter-stop or set of counter-stops are normally out of cooperative relation and means are provided for establishing a cooperative relation between these two sets of stops. As shown in the present instance, one of these sets of stops is normally out of the path of the other, but is movable into the path of the other, and in the present instance it is the counter-stop or set of counter-stops that is thus made movable. To this end the shaft 38 is made movable up and down in its bearings.

The upward motion of the shaft 38 is limited by the contact of the toothed member 37 with the upper bearing of the shaft, and its downward motion is limited by a collar 40 making contact with the bearing 39. The shaft normally stands in its lower position, shown in Fig. 1, with the teeth 36 out of the path of the column stops 34, but said shaft is adapted to be raised to bring said teeth into the path of said stops by means that will presently be described. The top plate 7 is formed at its edges with the usual depending flange 41 and, as is shown in Fig. 4, said flange is cut away where the toothed member 37 is journaled in order to avoid interference with said toothed member. At its lower end the shaft 38 has rigidly mounted thereon a pinion 42 that meshes with rack teeth 43 formed on the front face of a transverse, horizontally disposed square bar 44 that is slidably mounted in lugs or bosses 45 and 46 projecting from the forward inclined face of the back plate 2. Each of the lugs 45 and 46 is grooved in its forward face to receive the bar 44 which is retained in place by plates 47 and 48, secured by screws 49 to the front faces of the lugs 45 and 46, respectively. The pinion 42 is of such length that it meshes with the rack-teeth 43 whether the shaft 38 is in its lower or in its upper position. The bar 44 extends nearly to the right-hand side plate,

and near its right-hand end said bar is cut away on its under side to form a stop shoulder 50 (Fig. 4) that is adapted to be arrested by any one of a plurality of stops consisting of the upwardly curved ends 51 of a plurality of tabulator key levers 52 which extend toward the front of the machine, being pivoted near their middles on a stud 53 projecting from a boss 54 of the right-hand side plate 1. Each of the key levers 52 has pivoted to its forward end at 55 a key stem 56 that extends upward through a suitable opening in the key-board plate 4. Tabulator keys 57 are mounted on the upper ends of the stems 56. As shown in the present instance the levers 52 are arranged side by side and close together throughout the greater part of their length, but near their rear ends all of the levers except the first are formed with offset bends as shown in Fig. 3 in order to space the stop portions 51 of said levers a suitable distance apart. At their forward ends the levers 52 are preferably bent, as shown in Fig. 3, so as to bring all of the keys 57 into a straight line fore and aft of the machine. The rear ends of the key levers 52 are guided in vertical slots 58 formed in the plate 48. Said key levers are returned to normal position by springs 59 each of which is secured at its upper end to one of said levers and at its lower end to a pin 60 projecting from the side plate 1. In order to return the bar 44 to its normal right-hand position the left-hand end of said bar is made round as shown in Fig. 4 and is surrounded by a coiled spring 61 which is compressed between the shoulder 62 of said bar and a bracket 63 in which the left-hand end of the bar is slidably mounted.

In order to raise the shaft 38 to bring the stop arms or teeth 36 into the path of the column stops 34 the hub 64 of the pinion 42 is formed with an annular groove that is engaged by two pins 65 that project into said slot from the forks of a furcated arm 66 that projects toward the front of the machine from a rock shaft 67 that extends transversely of the machine and is journaled at one end in the bracket 63 and at the other end in a bracket 68 on the back plate 2. The shaft 67 at its right-hand end passes behind the rear ends of the key levers 52 and is bent forward as shown in Fig. 3 at 69 and thence to the left over the key levers 52, forming a universal bar 70 for said key levers. The construction is such that when any of said key levers is operated by depressing the appropriate key 57, the universal bar 70 is elevated, the shaft 67 is rocked toward the rear of the machine and the shaft 38 is raised by the arm 66, thus bringing the stop teeth 36 into the path of the column stops 34.

In order to release the carriage when a

tabulator key is depressed the rock shaft 67 has mounted thereon a depending arm 71 which is adapted to engage a cross piece 72 formed on the lower end of an arm 73 that projects downward from a short rock shaft 74 that is pivoted on pivot screws 75 threaded through the arms of a bracket 76 secured to the under side of the back plate 2. The rock shaft 74 has an arm 77 projecting upwardly therefrom and adapted to engage the front face of the arm 27, the end of which lies in the peripheral groove in the collar 24. The construction is such that when the shaft 67 is rocked by any of the tabulator key levers the arm 27 is pressed toward the rear of the machine and the clutch teeth on the collar 24 are moved out of engagement with the corresponding clutch teeth on the hub of the pinion 23, thus freeing the carriage from the restraint of the escapement and permitting it to move under the impulse of its driving spring 20. In order to avoid releasing the carriage before the arms 36 are raised into the path of the column stops, there is lost motion between the arm 71 and the cross-piece 72, as indicated in Fig. 1. The stop teeth 36 are so designed that each of the column stops 34 in passing said stop piece engages one of said teeth and turns the rotary stop member a unit's distance, thus bringing the next succeeding tooth 36 into position to be engaged by the next succeeding column stop 34 and turning the shaft 38. The shaft 38 and pinion 42 will draw the bar 44 toward the left until the shoulder 50 is arrested by the stop portion 51 of the operated key lever. If the first key lever on the right has been depressed the bar 44 will be arrested after so slight a motion that the first column stop will be arrested by the first arm 36. If the second key lever has been operated the shoulder 50 will be arrested when the second tooth 36 is struck by the second column stop 34, and the carriage will stop at the second column position. If the third or fourth key lever is operated the carriage will be arrested by the third or fourth column stop and at the third or fourth column position.

In order to prevent backward rotation of the shaft 38 after it has been partially turned by one of the column stops and before the next arm 36 is engaged by the next succeeding column stop, a detent 78 is mounted in the lug 45 just above the rack bar 44, the disposition of the parts being such that when the shaft 38 is in its elevated position the pinion 42 is in engagement with the detent 78; but when the parts are in their normal position said pinion is out of engagement with said detent. The detent 78 consists of a squared plunger seated in a suitable opening in the lug 45 and having a rounded stem 79 that fits into a round hole in said lug. The stem 79 is

hollow, as shown in Fig. 5, and a spring 80 is seated in said stem and compressed between the detent 78 and the inner end of the hole in which the stem 79 is seated. The spring 80 tends to press the detent toward the front of the machine, its motion being limited by the plate 47 as indicated in Fig. 5. The outer end of the detent is made square and fits into a square opening so as to prevent rotation; and the end of the detent is formed as shown in Fig. 5 with an edge that is adapted to enter the space between two teeth of the pinion 42. Said edge has an abrupt face adapted to prevent backward rotation of said pinion and an inclined face which renders the detent movable by a tooth of the pinion when the shaft is turned by a column stop.

The operation of my tabulator or column jumper will be understood from the foregoing description. Any desired number of column stops 34 may be placed on the bar 31 and suitably located thereon, the stops being independently adjustable along said bar. If it is desired to bring the carriage to the third column position, for example, the tabulator key marked "3" will be depressed, this key being connected with the third key lever 52 from the left. The rear end of the lever 52 will elevate the universal bar 70, thus rocking the shaft 67 and elevating the shaft 38 and releasing the carriage by the arm 71 engaging the cross piece 72. The elevation of the shaft 38 has brought the arms 36 into the path of the column stops and has also brought the pinion 42 into engagement with the detent 78. The first column stop will strike the first arm 36 and will move this arm out of the path of the stops and the next succeeding arm into the path of the stops, rotating the shaft 38 a unit's distance, in which position it will be retained by the detent 78. The second stop will strike the second arm 36 and will move it and the shaft 38 in the same manner, thus turning said shaft 38 a second unit's distance and bringing the shoulder 50 close to the operated key lever. The third column stop, therefore, will be unable to turn the shaft 38 and will be arrested by the third stop arm 36. When the key is released the sleeve 24 will move toward the front of the machine, bringing its clutch teeth again into engagement with the clutch teeth on the pinion 23, thus retaining the carriage in the position where it has been arrested. The shaft 38 will drop to its lower position, thus bringing the arms 36 out of the paths of the stops 34 and leaving the carriage free to move either way without interference by said arms 36. The pinion 42 will escape from the detent 78 and the spring 61 will restore the bar 44 to its normal position in which it is arrested by a pin 81 projecting from said bar and engaging the plate 48. In this po-

sition the first arm 36 is in the position shown in Fig. 2, that is to say, it is in such position that when the shaft 38 is again raised, said first arm 36 will be in position to be struck by the first column stop 34.

In the present instance I have shown four column keys but it will be obvious that any desired number may be provided. If, in the present construction, it is desirable to use more than four column stops the carriage can be brought to any column beyond the fourth by a plurality of operations of the keys. For example, if it is desired to bring the carriage to the seventh column position, this can be done by operating the fourth column key, thus bringing the carriage to the fourth position and then operating the third column key which will result in the carriage being arrested by the seventh column stop. By reference to Fig. 4 it will be seen that the shoulder 50 will move a short distance before it will be arrested by the first column key so that when this key is operated the first arm 36 moves a little to the left under the impulse of the column stop and when the key is released the stop returns to its normal position. This, taken together with the fact that there is a slight lost motion in the connection between the carriage and its escapement mechanism, will insure that the stop 34 will come to rest to the left of the arm 36 so that in case the tabulator is operated twice without any intervening operation of the escapement, the column stop first arrested will have passed to a position where it will not interfere with the second raising of the shaft 38.

The escapement mechanism may be of any suitable sort. In the present instance, I have shown a small universal bar 84 mounted on a lever 85 and situated near the printing point in position to be struck by a contact portion 86 of the type bar 87 when the latter is thrown up to print. The lever 85 on which the universal bar is mounted is pivoted at 88 to a bracket 89 secured to the front face of the frame plate 18. In said bracket there is journaled a shaft 90, having at its lower end a skew pinion 91, meshing with a gear wheel 92 mounted on the shaft 22. At its upper end, the shaft 90 carries a single tooth 93 that is controlled by feed dogs 94 on the lower end of the lever 85. The construction is such that when the universal bar 84 is struck by any type bar, the lever 85 is oscillated and the tooth 93 is released, permitting the shaft 90 to make one complete rotation, thus imparting a letter-space feed to the carriage.

It will be observed that my column jumper is of such construction that it is not necessary to make any difference between the different column stops 34 as has been usual heretofore in column jumper mechanisms. A column is selected not by selecting a col-

umn stop of a particular size or shape but by registering, or, in effect, counting, or keeping tally of the column stops as they pass the rotary member 37. The first key arrests the first stop that reaches said rotary member, the second key arrests the second stop, etc. If the first column stop has already passed the rotary member in order to arrest the third column stop, the second key will be depressed instead of the third. It will be obvious that this counting or registering of the column stops may be effected by means differing greatly from that here shown. As far as I am aware this principle is broadly new in tabulator mechanism and my claims are intended to cover broadly all tabulator devices made in accordance with said principle.

When the carriage is at its extreme right-hand position the column or tabulator stops all face the counter-stop, and in the present instance in which said column stops are mounted on the carriage, the column or tabulator stop which is then next to or which proximately faces the counter-stop is the first stop from the left end of the stop bar. It will be understood that the column or tabulator stops may be made to coact successively with the counter-stops as the carriage travels toward the left and that by pressing the proper key a tabulator stop behind, or in the present instance, to the right of, that which proximately faces said counter-stop, may be made to coact with said counter-stop to effect the arrest of the carriage after it is released from the step-by-step feeding mechanism and before it is otherwise arrested by the tabulating mechanism.

Various other changes besides those indicated in the body of the specification may be made in the details of construction and arrangement without departing from my invention.

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

1. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a series of column stops each adjustable to different letter space positions, said stops being in a straight row and projecting equal distances from their support, a counter-stop, and means to render the counter-stop, and a column stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

2. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a series of column stops each adjustable to different letter space positions, said stops being in a straight row and projecting equal

distances from their support, a counter-stop, and means including key actuated devices each operative to render the counter-stop, and a column stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

3. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop support on the carriage, a series of column stops on said support, said stops being in a straight row and projecting equal distances from said support, a counter-stop supported by the frame of the machine, and key controlled means operative to render the counter-stop, and a column stop behind that which proximately faces the counter-stop effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

4. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a series of column stops each adjustable to different letter space positions, said stops being in a straight row and projecting equal distances from their support, a counter-stop coöperative with each of said column stops, and means including a key actuated device operative to render the counter-stop and a column stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

5. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop bar with tabulator stops thereon, said stops being in a straight row, a compound counter-stop having arms coöperative with said tabulator-stops, and key controlled means to render an arm of the counter-stop and a tabulator stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

6. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with tabulator stops thereon, said stop-bar being on the carriage and said stops being in a straight row, a compound counter-stop having arms coöperative with said tabulator stops, said counter-stop being supported by the frame of the machine, and key controlled means operative to render an arm of the counter-stop, and a tabulator stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the car-

riage after it is released and before it is otherwise arrested by said tabulating mechanism.

7. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with tabulator stops thereon, said stops being in a straight row, a rotary counter-stop having integral arms cooperative with said tabulator stops, and means to render an arm of the counter-stop, and a tabulator stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

8. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with tabulator stops thereon, said stops being in a straight row, a rotary counter stop having integral arms cooperative with said tabulator stops, and means including key-actuated devices each operative to render an arm of the counter-stop, and a tabulator stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

9. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with tabulator-stops thereon, said stop-bar being on the carriage and said stops being in a straight row, a rotary counter-stop having integral arms, said counter-stop being supported by the frame of the machine, and means including key-actuated devices each operative to render an arm of the counter-stop, and a tabulator-stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

10. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with tabulator stops thereon, said stops being in a straight row and projecting equal distances from the stop bar, a compound counter-stop having arms cooperative with said tabulator stops, and means to render an arm of the counter-stop, and a tabulator stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

11. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with tabulator stops thereon, said stops being in a straight row

and projecting equal distances from the stop-bar, a rotary counter-stop having integral arms cooperative with said tabulator stops, and means to render an arm of the counter-stop, and a tabulator stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

12. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with tabulator stops thereon, said stop bar being on the carriage and said stops being in a straight row and projecting equal distances from the stop-bar, a rotary counter-stop having integral arms cooperative with said tabulator stops, said counter-stop being supported by the frame of the machine, and means to render an arm of the counter-stop, and a tabulator stop behind that which proximately faces the counter-stop, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

13. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop bar with column stops thereon each adjustable to different letter space positions, said stops being in a straight row and projecting equal distances from the stop-bar, a set of stops cooperative with said column-stops, and means to render a stop of said set, and a column-stop behind that which proximately faces said set of stops, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

14. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with column stops thereon each adjustable to different letter space positions, said stop-bar being on the carriage and said stops being in a straight row and projecting equal distances from the stop bar, a set of stops cooperative with said column-stops, said set of stops being supported by the frame of the machine, and means to render a stop of said set, and a tabulator-stop behind that which proximately faces said set of stops, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

15. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with column stops thereon each adjustable to different letter space positions, said stops being in a straight row,

a set of stops arranged to contact with the column stops at equal distances from the stop-bar, and means to render a stop of said set and a column stop behind that which

5 proximately faces said set of stops, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

16. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with column stops thereon each adjustable to different letter space positions, said stop-bar being on the carriage and said stops being in a straight row, a set of stops supported by the frame of the machine and subject to contact with the column stops at equal distances from the stop-bar, and means to render a stop of said set, and

20 a column stop behind that which proximately faces said set of stops, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

25 17. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with column stops thereon each adjustable to different letter space positions, said stops being in a straight row and projecting equal distances from the stop-bar, a set of stops subject to contact with the column stops at equal distances from the stop-bar, and means to render a

35 stop of said set, and a column-stop behind that which proximately faces said set of stops, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

40 18. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with column stops thereon each adjustable to different letter space positions, said stops being in a straight row, a set of stops subject to contact with the column stops at equal distances from the stop-bar, and means including key-actuated

50 devices each operative to render a stop of said set, and a column-stop behind that which proximately faces said set of stops, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

55 19. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-bar with column stops thereon each adjustable to different letter space positions, said stop bar being on the carriage and said stops being in a straight row, a set of stops supported by the frame of the

65 machine and subject to contact with the

column stops at equal distances from the stop-bar, and means including key-actuated devices each operative to render a stop of said set, and a column-stop behind that which proximately faces said set of stops, effective at a single operation to arrest the carriage after it is released and before it is otherwise arrested by said tabulating mechanism.

20. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of movably mounted connected stops, and mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position.

21. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions when the carriage is disconnected from the escapement, said tabulating mechanism comprising a rotary device having a set of stops fast thereon, and mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position.

22. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of connected stops movably mounted on the frame of the machine, and mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position.

23. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of connected stops mounted on the frame of the machine and having angular motion, and mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position.

24. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said

tabulating mechanism comprising a set of movably mounted and connected stops, mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position, and a key-actuated device operative to limit the movement of said stops.

25. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of movably mounted and connected stops having angular motion, mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position, and a key-actuated device operative to regulate the movement of said stops.

26. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of movably mounted and connected stops mounted on the frame of the machine, mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position, and a key-actuated device operative to limit the movement of said stops.

27. A typewriting machine containing step-by-step carriage-feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of movably mounted and connected stops mounted on the frame of the machine and having angular motion, mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position, and a key-actuated device operative to limit the movement of said stops.

28. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with tabulator stops thereon, said stop-support being on the carriage, a set of stops cooperative with said tabulator stops, said set of stops being supported by the frame of the machine and the contact faces of the last-mentioned stops being in intersecting planes, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

29. In a typewriting machine, the combi-

nation with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with a plurality of independently adjustable column stops thereon, a set of counter-stops having angular motion, the faces of the stops of said set being cut by a plane which is at right angles to their axis of rotation, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

30. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with tabulator stops thereon, said stop-support being on the carriage, a set of counter-stops having angular motion, said set of stops being supported by the frame of the machine and the faces of the stops of said set being cut by a plane which is at right angles to their axis of rotation, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

31. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with a plurality of independently adjustable column stops thereon, a rotary device including a set of counter-stops fast on the body of said device, the faces of the stops of said set being in intersecting planes, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

32. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with tabulator stops thereon, said stop-support being on the carriage, a rotary device supported by the frame of the machine and including a set of counter-stops fast on the body of said device, the face of said counter-stops being in intersecting planes, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

33. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with a plurality of independently adjustable column stops thereon, a rotary device including a set of counter-stops fast on the body of said device, the faces of said counter-stops being cut by a plane, which is at right angles to the axis of said rotary device, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

34. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with tabulator stops thereon, said stop-support being on the carriage, a rotary device supported by the frame of the machine and including a set

of counter-stops fast on the body of said device, the faces of said counter-stops being cut by a plane which is at right angles to the axis of said rotary device, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

35. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with a plurality of independently adjustable column stops thereon, a rotary device including a set of counter-stops fast on the body of said device, the faces of said counter-stops being at right angles to and being cut by a plane which is at right angles to the axis of said rotary device, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

36. In a typewriting machine, the combination with the carriage and escapement-mechanism, of tabulating mechanism comprising a stop-support with tabulator stops thereon, said stop support being on the carriage, a rotary device supported by the frame of the machine and including a set of counter-stops fast on the body of said device, the faces of said counter-stops being at right angles to and being cut by a plane which is at right angles to the axis of said rotary device, and key-actuated means for insuring the co-action of particular stops in arresting the carriage.

37. A typewriting machine containing step-by-step carriage feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of connected stops having angular motion on a vertical axis, and mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position.

38. A typewriting machine containing step-by-step carriage feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a set of connected stops mounted on the frame of the machine and having angular motion on a vertical axis, mechanism arranged to be actuated by the carriage and operative on one of the stops of said set to move another of said stops to its operative position, and a key actuated device operative to limit the movement of said stops.

39. A typewriting machine containing step-by-step carriage feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is

disconnected from the escapement, said tabulating mechanism comprising a series of tabulator stops, a set of movably mounted connected counter-stops, and means to render one of said counter-stops movable to its operative position by the action of a tabulator stop on another counter-stop.

40. A typewriting machine containing step-by-step carriage feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a series of tabulator stops, a set of connected counter-stops having angular motion, and means to render one of said counter-stops movable to its operative position by the action of a tabulator stop on another counter-stop.

41. A typewriting machine containing step-by-step carriage feed mechanism including an escapement and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a series of tabulator stops on the carriage, a set of connected counter-stops mounted on the frame of the machine, and means to render one of said counter-stops movable to its operative position by the action of a tabulator stop on another counter-stop.

42. A typewriting machine containing step-by-step carriage feed mechanism including an escapement, and tabulating mechanism operative to arrest the carriage at different selected positions, when the carriage is disconnected from the escapement, said tabulating mechanism comprising a series of tabulator stops on the carriage, a set of connected counter-stops mounted on the frame of the machine, and having angular motion, and means to render one of said counter-stops movable to its operative position by the action of a tabulator stop on another counter-stop.

43. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops and a movable stop member cooperating therewith to arrest the carriage, said stop member being movable a unit's distance by each of different column stops; and means for preventing the movement of said stop member when any selected column stop makes contact therewith.

44. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops and a movable stop member cooperating therewith to arrest the carriage, said stop member being movable a unit's distance by each of different column stops; a plurality of tabulator keys; and means controlled by said keys

for preventing the movement of said stop member when different selected column stops make contact therewith.

45. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops and a rotary stop member cooperating therewith to arrest the carriage, said rotary stop member being adapted to be turned a unit's distance by each of different column stops; and means for preventing the movement of said stop member when different selected column stops make contact therewith.

46. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops and a movable stop member cooperating therewith to arrest the carriage, said stop member being movable by each of different column stops; and means for preventing the movement of said stop member when any selected column stop makes contact therewith.

47. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops; a rotary stop member cooperating with said column stops to arrest the carriage, and means to enable said rotary stop member to be turned by different ones of said column stops.

48. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of separately adjustable column stops; and a movable toothed stop member cooperating therewith to arrest the carriage at any one of a plurality of column positions, said column stops being cooperative with the teeth of said toothed member to effect a movement of the latter.

49. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops; a stop member adapted to be moved into position to engage said column stops and to be moved by each of different column stops; means for holding said stop member at different points; and means for returning said stop member to normal position.

50. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops and a rotary stop member cooperating therewith to arrest the carriage, said rotary stop member being adapted to be turned a unit's distance by each of different column stops; a plurality of tabulator keys; and means controlled by said keys for holding said rotary stop member at different points.

51. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops and a movable stop member cooperating therewith to arrest the carriage, said movable stop member being normally out of cooperative relation with said column stops, and being adapted, when in such cooperative relation,

to be moved a unit's distance by each of different column stops; a plurality of tabulator keys; means controlled by any of said keys for bringing said column stops and said stop member into cooperative relation; and means controlled by said keys for holding said movable stop member at different points; and a carriage release device operated by any of said keys.

52. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops, each independently adjustable to different letter space positions; a rotary stop member for cooperating with said column stops to arrest the carriage, said rotary stop member being adapted to be turned a unit's distance by each of different column stops, and means for holding said rotary stop member at selected points to arrest said carriage at selected column positions.

53. In a typewriting machine and in tabulating mechanism, the combination of a carriage; a plurality of column stops; and a movable toothed stop member cooperating therewith to arrest said carriage at any one of a plurality of column positions, each of said column stops being adapted to strike a tooth of said toothed member and to move it a unit's distance; and means for holding said toothed member at different points.

54. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops mounted on said carriage and independently adjustable thereon, a toothed member mounted on the main frame of the machine and movable into and out of the path of said column stops and adapted to be turned by said column stops, a bar geared to said toothed member, and means for holding said bar at different points.

55. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops, a movable stop member, means for moving said stop member into position to engage said column stops, said stop member being arranged to be moved a unit's distance by each of different column stops, means for holding said stop member at different points, and means for returning said stop member to normal position.

56. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops, a movable stop member, means for moving said stop member into position to engage said column stops, said stop member being arranged to be moved a unit's distance by each of different column stops, means for arresting said stop member at different points, a spring for returning said stop member to normal position, and a detent for holding said stop member against the tension of said

spring when said stop member is in position to engage the column stops.

57. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops, each independently adjustable, a plurality of cooperating movable stops, means for moving said cooperating stops into the path of said column stops, said cooperating stops being arranged to be moved by said column stops out of said path one at a time, and means for retaining any selected one of said cooperating stops in the path of said column stops and thereby arresting a selected one of said column stops.

58. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops mounted on said carriage, a movable stop member, means for moving said stop member into position to engage said column stops, said stop member being arranged to be moved a unit's distance by each of said column stops, a plurality of tabulator keys, means controlled by any of said keys for moving said stop member into position to engage said column stops, and means controlled by the different keys for arresting said stop member at different points.

59. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops, a movable stop member, means for moving said stop member into position to engage said column stops, said stop member being arranged to be moved a unit's distance by each of said column stops, a spring for moving said stop member in the direction opposite of that in which it is moved by said column stops, a detent for holding said stop member against the tension of said spring, a plurality of tabulator keys, means controlled by any of said keys for moving said stop member into position to engage said column stops, said means also bringing said detent into operation, and means controlled by the different keys for arresting said stop member at different points.

60. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops, a member adapted to be moved a unit's distance by each of said column stops, said member being normally out of operative relation with said column stops, a plurality of tabulator keys, means controlled by any of said keys for establishing a cooperative relation between said movable member and said column stops, and means controlled by the different keys for arresting said movable member after different numbers of units of motion.

61. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops mounted on said carriage and each independently ad-

justable, a shaft having a plurality of stop arms projecting therefrom, said shaft being movable to bring said stop arms into or out of the path of said column stops, whereby said column stops may engage said arms and thereby rotate said shaft, a plurality of tabulator keys, means controlled by any of said keys for moving said shaft to bring said arms into the path of said column stops, and means controlled by the different keys for arresting the rotation of said shaft at different points.

62. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops mounted on said carriage and each independently adjustable, a shaft having a plurality of stop arms projecting therefrom, said shaft being movable endwise to bring said arms into or out of the path of said column stops, a pinion on said shaft, a rack bar meshing with said pinion, a detent in position to engage said pinion when said shaft is moved endwise to bring said stop arms into the path of said column stops, a plurality of tabulator keys, means controlled by said keys for shifting said shaft, means controlled by the several keys for arresting said rack bar after different extents of motion, and a spring for returning said rack bar to its normal position.

63. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops, a device adapted to be operated through said column stops as the carriage moves from one columnar position to another, means for bringing said device and said column stops into cooperative relation, and means for locking said device at different positions and thereby arresting the carriage at different columns.

64. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops mounted on said carriage, a movable member adapted to be moved by each of said column stops that passes it, means for holding said movable member against motion to arrest the carriage after a selected number of column stops have passed said member, and a plurality of tabulator keys controlling said means.

65. In a typewriting machine and in tabulating mechanism, the combination of a carriage, column stops mounted on said carriage, a cooperating stop member adapted to be lifted into the path of said column stops, a tabulator key, a rock shaft extending transversely across the rear of the base of the machine, said rock shaft operated by said key, means whereby said rock shaft moves said tabulator stop into the path of said column stops, and means operated by said rock shaft for releasing the carriage.

66. In a typewriting machine and in tabulating mechanism, the combination of a carriage, column stops mounted on said carriage, a stop member adapted to cooperate with said column stops to arrest the carriage, a plurality of tabulator keys, a transverse horizontal rock shaft in the rear part of the base of the machine, said rock shaft adapted to be operated by any of said tabulator keys, means whereby said rock shaft moves said cooperating stop member into the path of said column stops, means controlled by the different keys for causing said stop member to arrest different ones of said column stops, and means operated by said rock shaft for releasing the carriage.

67. In a typewriting machine and in tabulating mechanism, the combination of a carriage, column stops mounted on said carriage, a cooperating stop adapted to be moved into the path of said column stops, a tabulator key, a transverse horizontal rock shaft in the rear of the base of the machine adapted to be operated by said tabulator key, means whereby said rock shaft moves said tabulator stop into the path of said column stops, an arm on said rock shaft, a lever adapted to be operated by said arm, and a carriage release device operated by said lever.

68. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops mounted on said carriage, a cooperating stop member adapted to be moved into the path of said column stop, a plurality of tabulator key levers, a rock shaft bent back on itself to constitute a universal bar that is adapted to be operated by any of said key levers, means whereby said rock shaft moves said stop member into the path of said column stop, and means controlled by the different keys for causing said stop member to arrest different ones of said column stops.

69. In a typewriting machine and in tabulating mechanism, the combination of a carriage, column stops mounted on said carriage, a rotary device having a plurality of stop portions adapted to be moved into the path of said column stops, a plurality of tabulator keys one for each of said stop portions, and means controlled by said keys for moving said rotary device to operative position and for causing the carriage to be arrested by the particular stop portion of said rotary device that corresponds to the operated key.

70. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a series of column stops mounted on

said carriage, a shaft mounted for rotary and endwise motion, a plurality of arms or teeth on said rock shaft adapted to be moved by endwise motion of said rock shaft into position to be struck by said column stops, a pinion on said shaft, a rack bar engaged by said pinion, a detent adjacent to said rack bar in such position that it is normally out of engagement with said pinion but is in engagement with said pinion when said rock shaft is moved endwise to bring the arms thereon into the path of the column stops, a plurality of tabulator keys, means whereby any of said keys imparts endwise motion to said shaft, and means whereby the different keys arrest said rack bar at points corresponding to the operative positions of different ones of said arms.

71. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops, and a column-selecting tabulating device operative step-by-step as the successive column stops pass said device and adapted to arrest the first, second or third stop, etc., according to the particular tabulator column desired.

72. In a typewriting machine and in tabulating mechanism, the combination with a carriage, of tabulator mechanism comprising a series of column stops and a co-acting engaging member provided with a plurality of contact surfaces, and means to variably control the movement of said co-acting member, thereby arresting the carriage at a selected columnar position and skipping intermediate columnar positions.

73. In a typewriting machine and in tabulating mechanism, the combination of a carriage, a plurality of column stops on said carriage, and a column selecting mechanism arranged to be actuated step-by-step by said column stops and to arrest a selected one of said stops corresponding to the desired columnar position of the carriage.

74. In a typewriting machine and in a tabulating mechanism, the combination of a carriage, a plurality of column stops, the contact faces of which are all in the same path of travel, and a column selecting mechanism including means for arresting at will and at a single operation any one of a plurality of the said stops according to the particular tabular column desired.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 20th day of April A. D. 1906.

JOHN H. BARR.

Witnesses:

E. E. CORY,
I. L. MARTIN.