

No. 885,716.

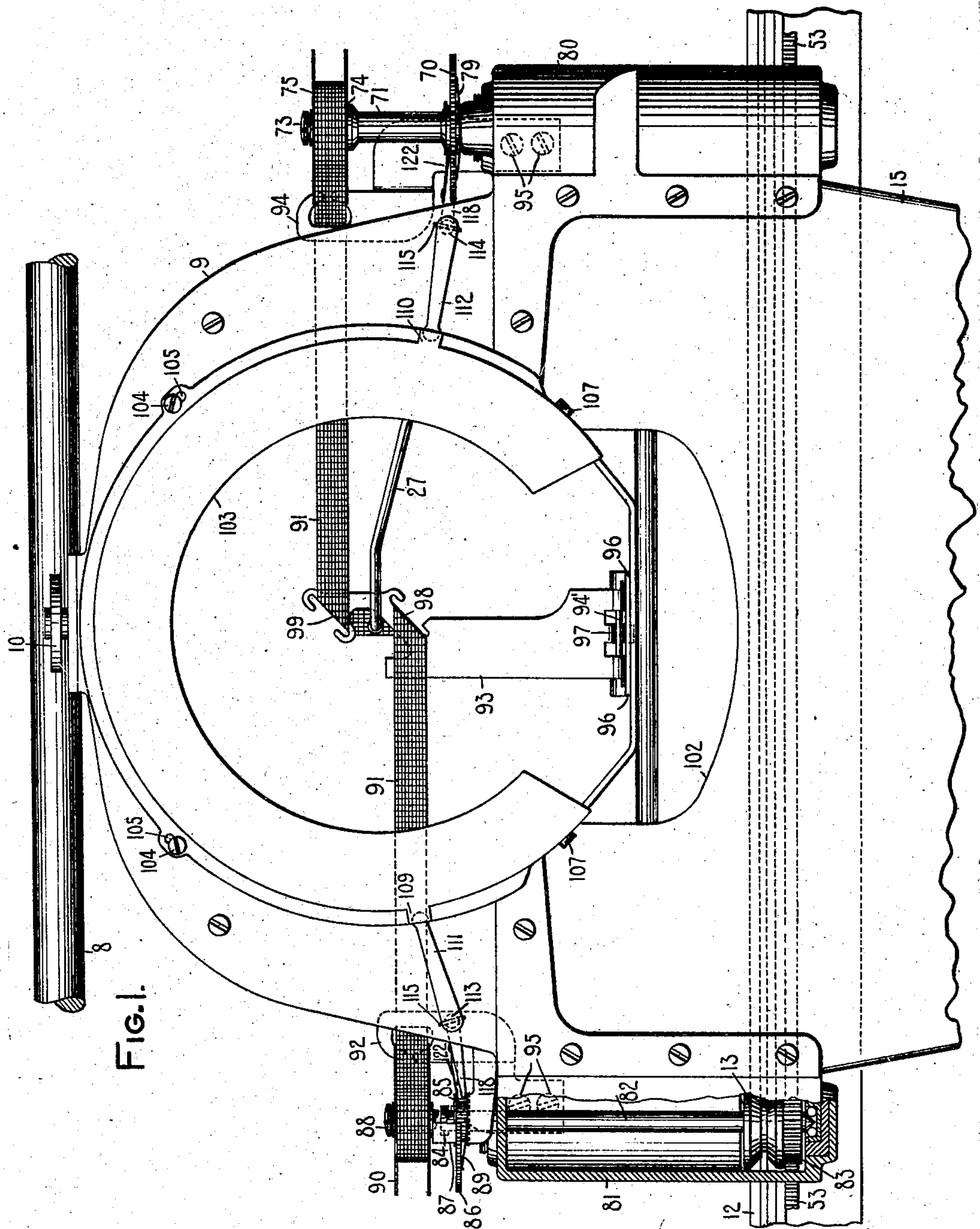
**PATENTED APR. 28, 1908.**

A. T. BROWN.  
TYPE WRITING MACHINE.

**TYPE WRITING MACHINE.**

APPLICATION FILED JAN. 4, 1905.

3 SHEETS--SHEET 1.



WITNESSES.

R. H. Strother.

W. F. Hamner.

INVENTOR:

Alexander T. Brown

by Jacob Feld

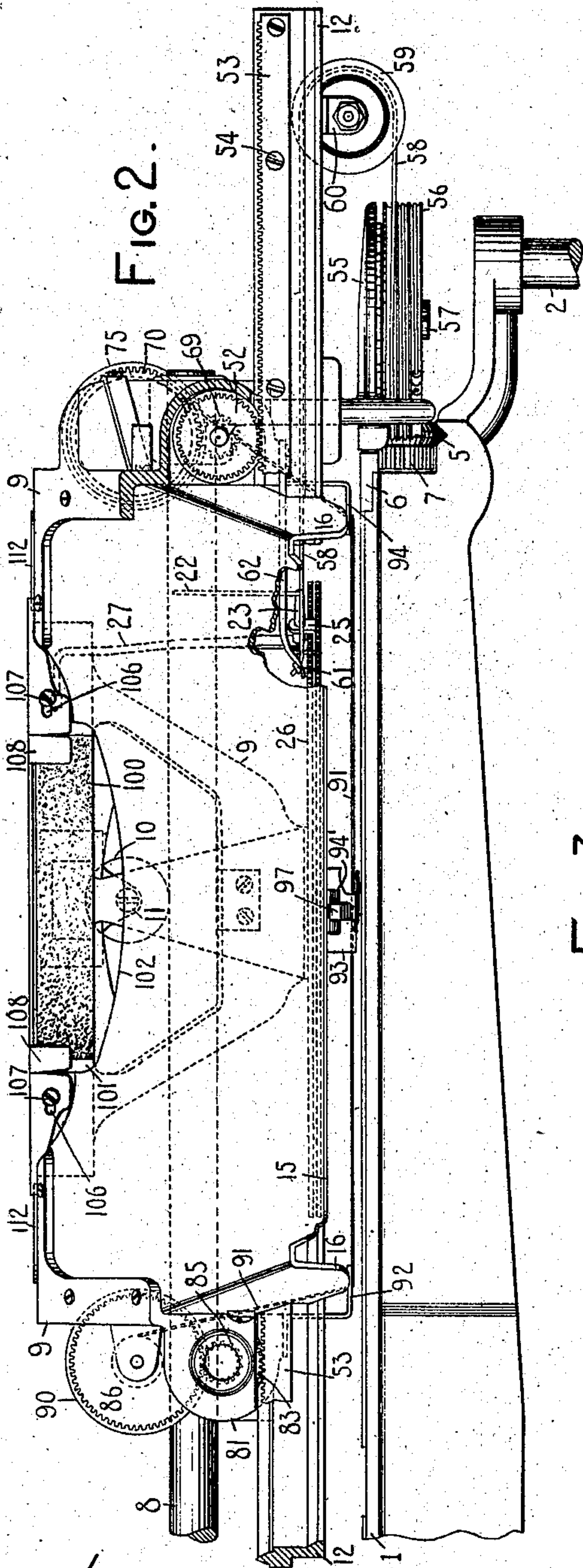
HIS ATTORNEY

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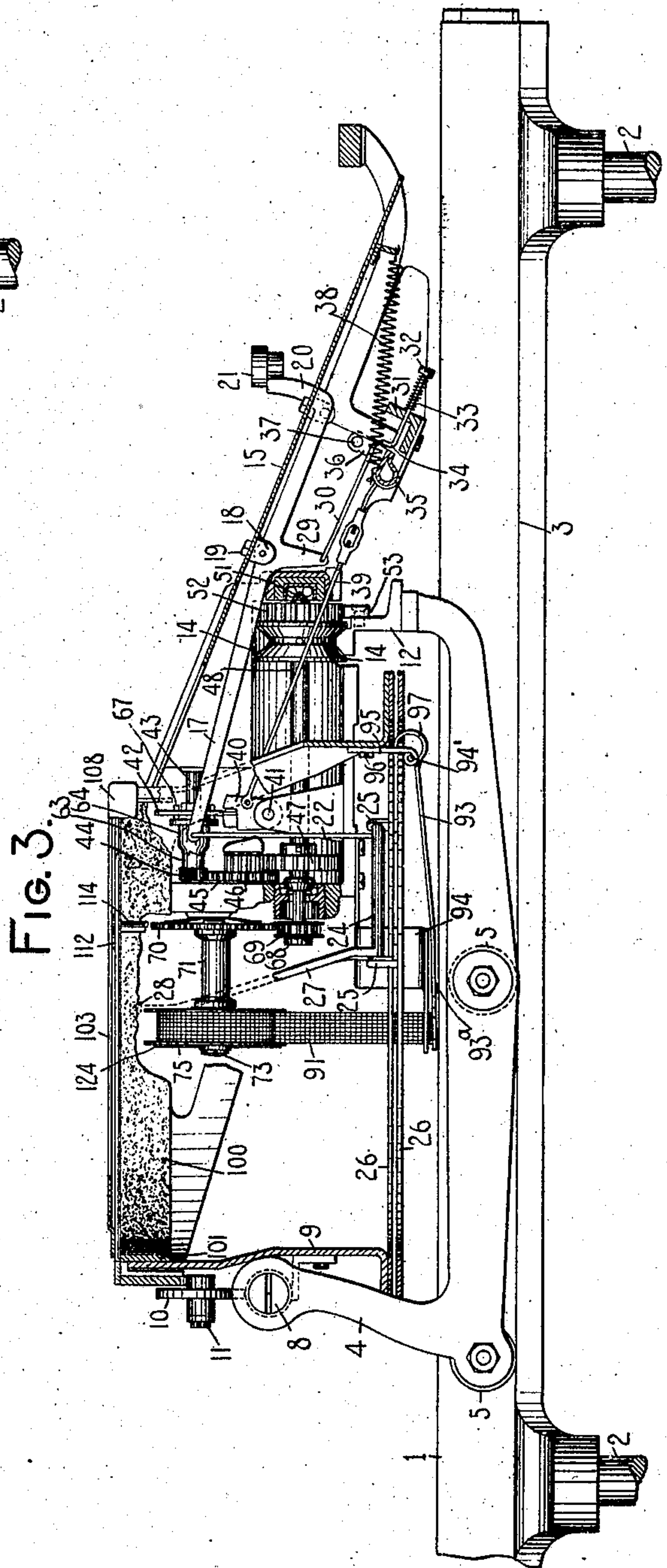
PATENTED APR. 28, 1908.

3 SHEETS—SHEET 2.



WITNESSES.

*R. H. H. H. H. H.*  
*Mr. F. H. H. H. H.*



INVENTOR.

*Alexander T. Brown*  
by *Jacob F. F.*  
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3 SHEETS—SHEET 3.

FIG. 4.

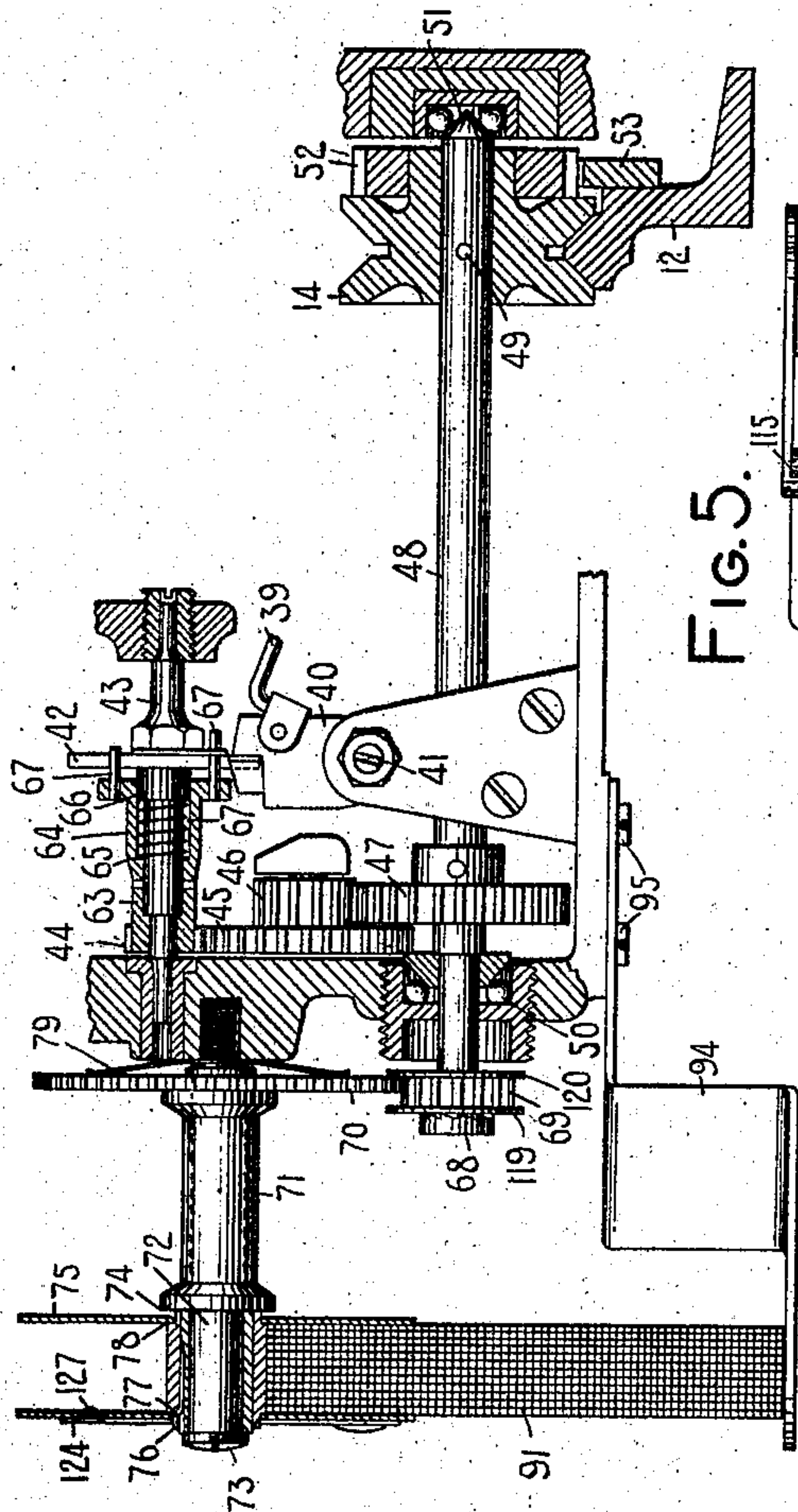


FIG. 10.

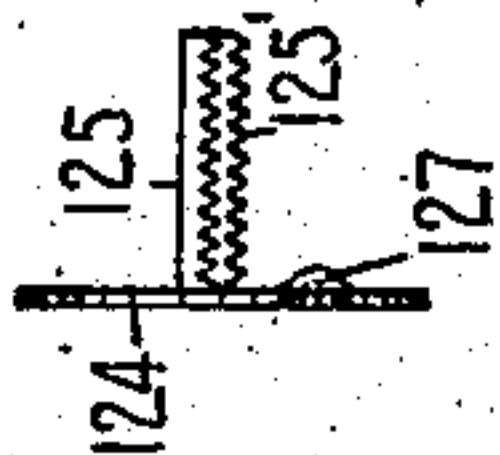


FIG. 5.

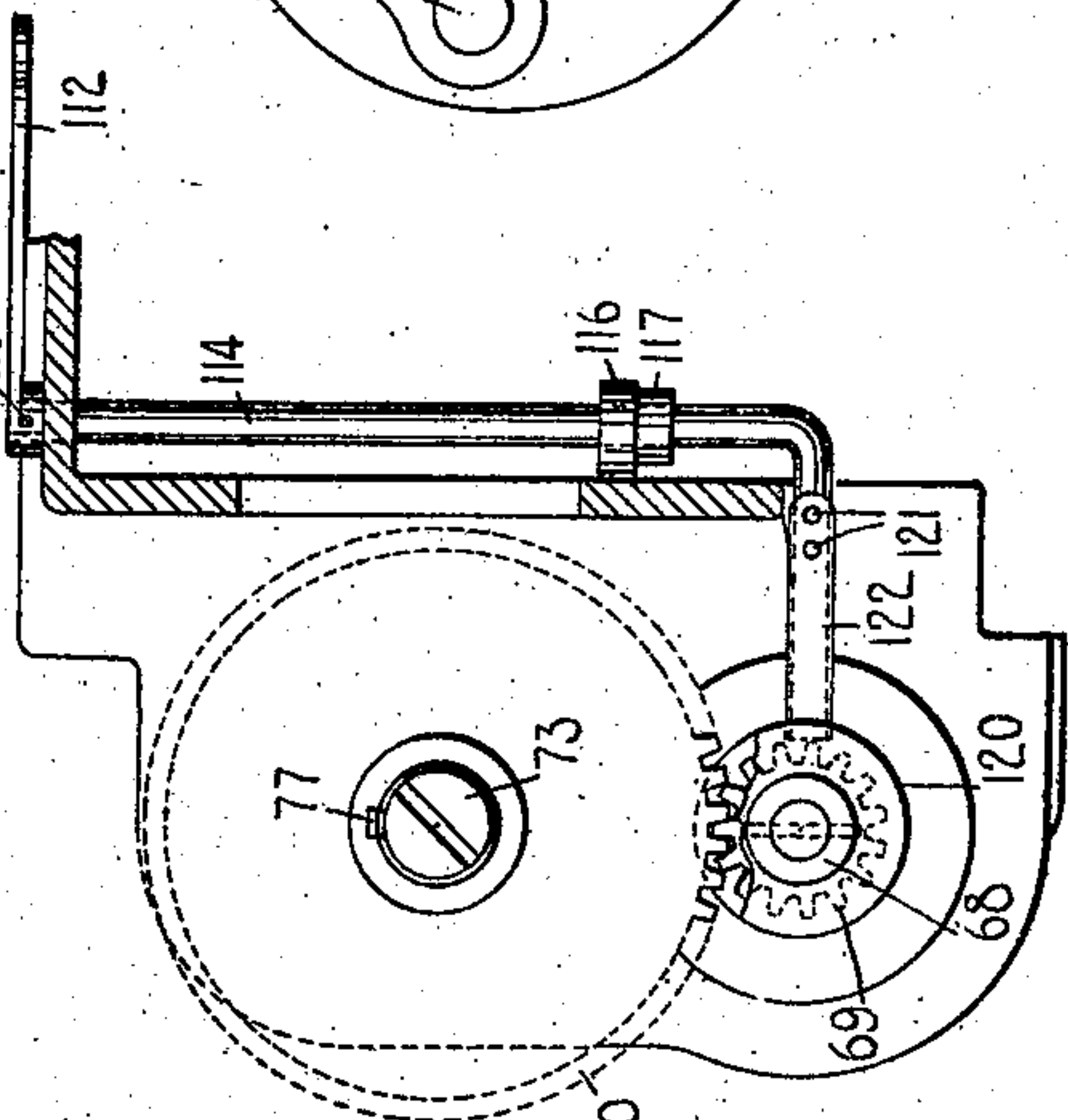


FIG. 8.

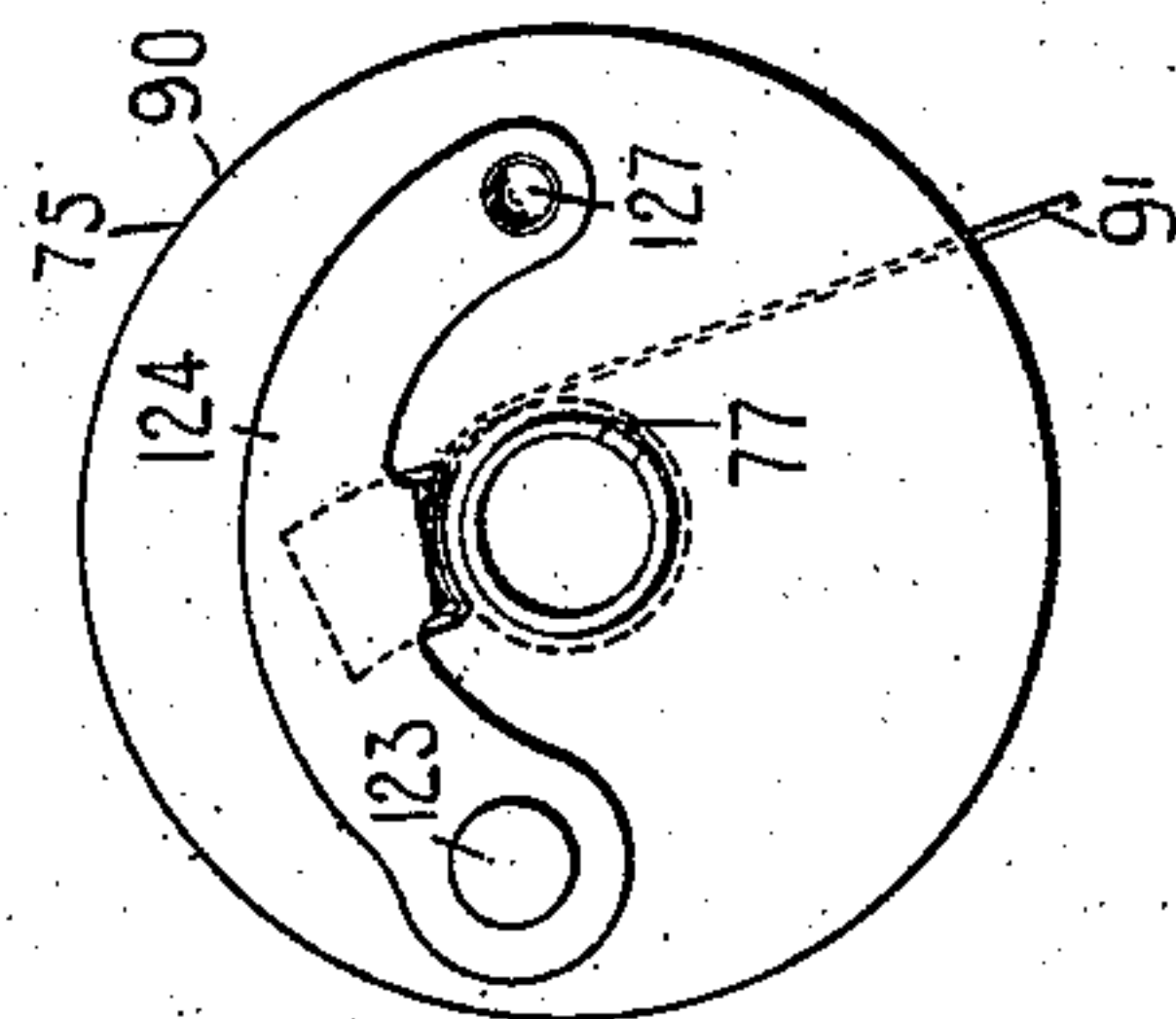


FIG. 9.

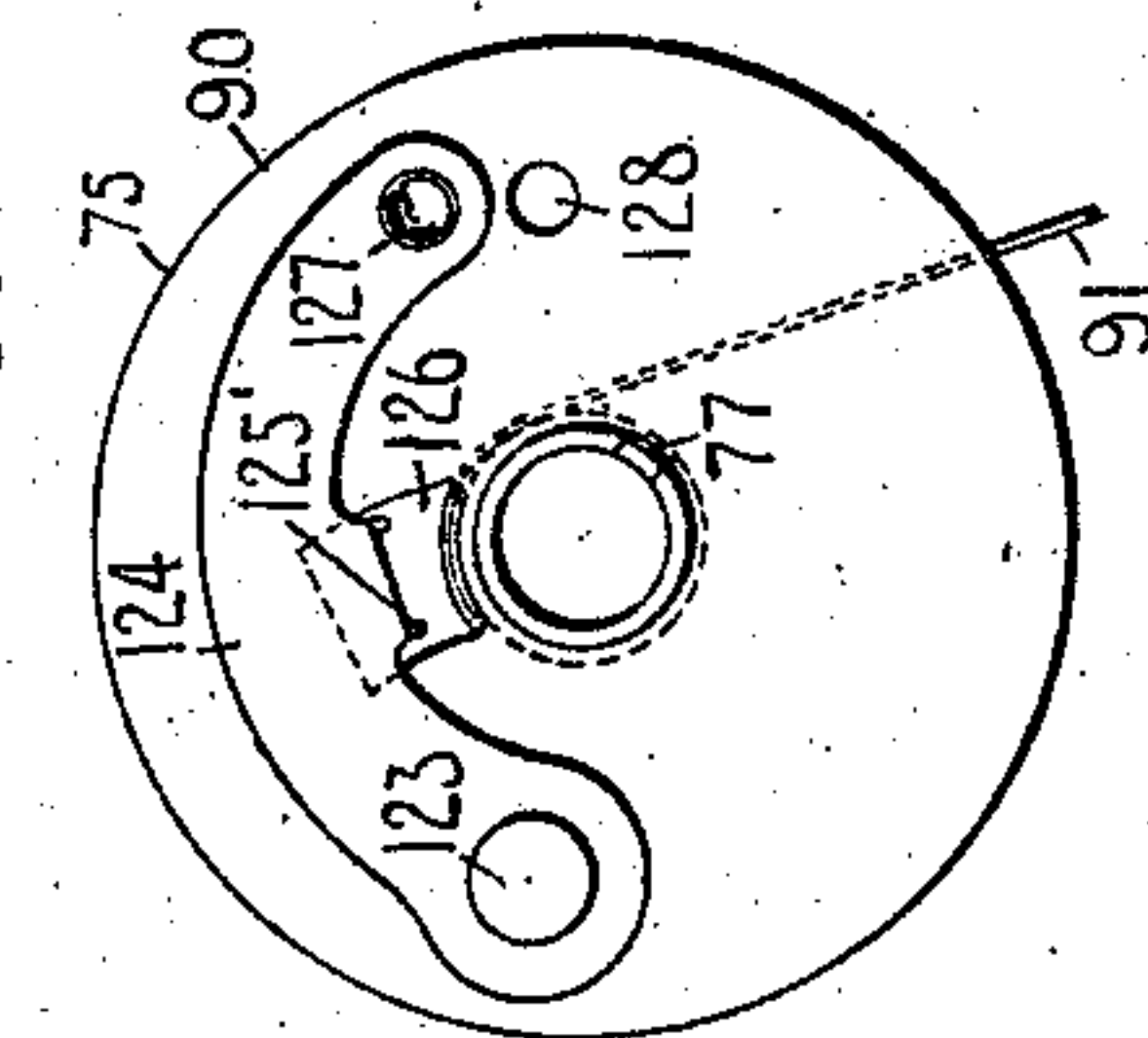


FIG. 6.

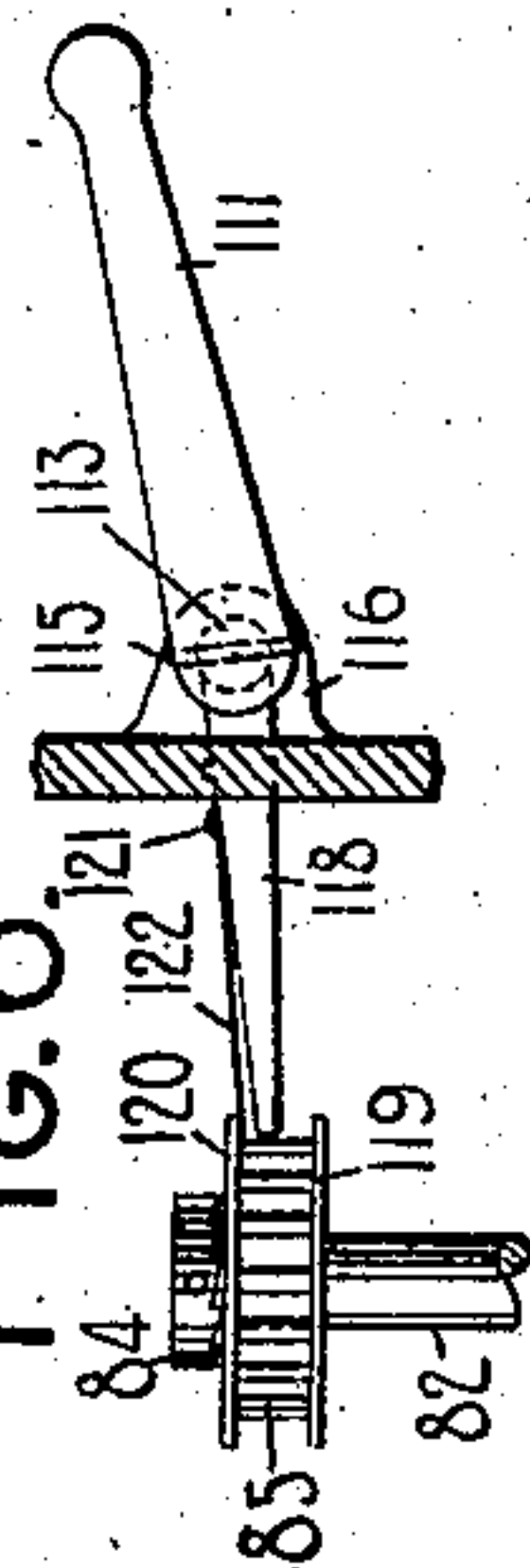
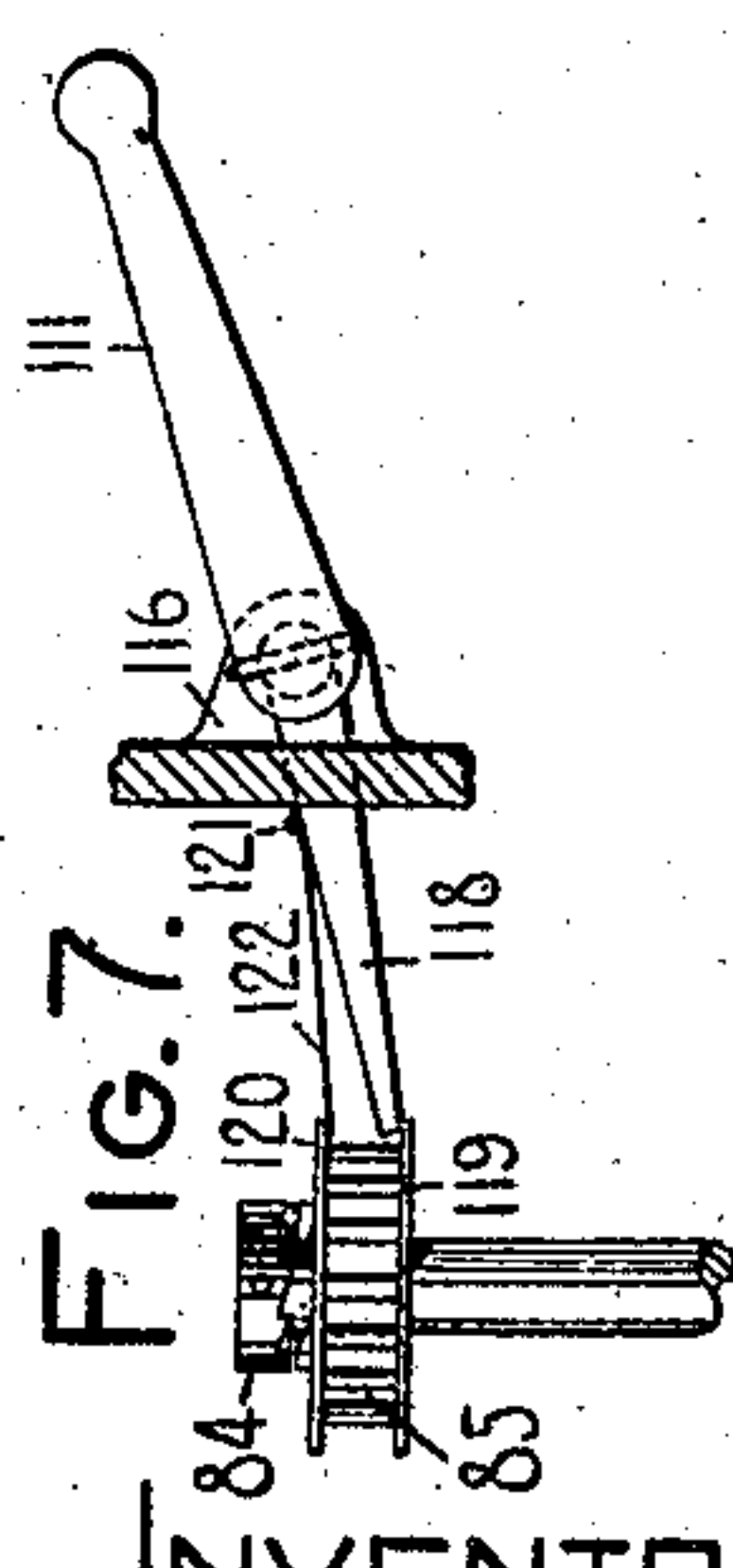


FIG. 7.



WITNESSES.

*R. Helthofer.*  
*W. F. Hammer.*

INVENTOR.

*Alexander T. Brown*  
By *Jacob Felber*  
HIS ATTORNEY



# UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

## TYPE-WRITING MACHINE.

No. 885,716.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed January 4, 1905. Serial No. 239,642.

*To all whom it may concern:*

Be it known that I, ALEXANDER T. BROWN, 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 has for its object to provide an improved ink ribbon mechanism for such machines.

My invention consists in certain features of construction and combinations of parts which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of a typewriting machine embodying my invention; Fig. 2 is a front elevation of the same; Fig. 3 is an end elevation, the carriage and printing mechanism being shown in vertical section; Fig. 4 is a detail vertical sectional view showing the escapement mechanism and one of the ribbon spools; Fig. 5 is a detail view of a portion of the ribbon mechanism in front elevation; Figs. 6 and 7 are detail views showing a clutch and the shifting device therefor, the clutch members being shown in engagement in Fig. 6 and disengaged in Fig. 7; Figs. 8 and 9 are end views of a ribbon spool showing the clamp for retaining the end of the ink ribbon in operative and inoperative positions respectively, and Fig. 10 is a detail view of said clamp.

In the present instance, I have shown my ribbon mechanism applied to a typewriting machine in which the printing mechanism is supported by a carriage which is movable over a stationary flat platen, but most of the features of my invention are equally applicable to other styles of typewriting machines. Said flat platen is designated by the reference numeral 1. The frame of said platen is supported on posts 2 and is provided with a rail or track 3 along each of its right and left hand edges. Said rails, or tracks are shown as depressed below the surface of the platen, and the line space frame 4 is supported by rollers 5 which engage said rails. Rack bars 6 extending from the right and left hand edges of the platen have rack teeth on the under side thereof which are engaged by feed pinions 7, by which the motion

of said line space frame is controlled. The line space frame comprises two end pieces connected together at the rear by a rod 8 and at the front by a rail 12. The rod 8 serves as a rail on which the rear part of the carriage 9 is supported by a roller 10 journaled on a stud 11 secured to said carriage. The forward part of the carriage is supported by rollers 13 and 14, traveling on the rail 12.

The construction of the platen and line-space mechanism need not be more particularly described herein as they are described and claimed in other applications of mine, co-pending herewith. The framework of the carriage 9, as shown in the present instance, includes a forwardly extending portion 15 which is shown as a plate of metal stiffened by depending side portions 16. The key levers 17 (Fig. 3) are pivoted on the under side of the plate 15 in lugs or ears 18 which, as here shown, are secured to said plate 15 by nuts 19 threaded onto screws or bolts connected to said ears 18 and projecting through said plate 15. At their forward ends, the key levers project upward, as shown at 20, through openings (not shown) in the plate 15, and are provided with keys 21. Links 22 are pivoted to the rear ends of the key levers 17 and connect said key levers with arms 23 (Fig. 2) on the outer ends of rock shafts 24 pivoted in ears 25 rising from an annular frame plate 26 of said carriage 9. The rock shafts 24 have a tangential arrangement well-known in the art and have projecting therefrom the type bars 27 which have upon their ends the types 28. The arrangement is such that upon the depression of any key lever the corresponding type is thrown downward against the flat platen 1. Each of the key levers is formed with a downwardly extending arm 29 (Fig. 3) to the lower end of which is pivoted a link or rod 30 extending forward therefrom and passing loosely through a suitable opening in the frame bar 31. Each of the links 30 has a nut 32 on the end thereof and a spring 33 coiled about said link 30 is compressed between the frame bar 31 and the nut 32 and tends to hold the key lever in normal position. Between the arm 29 and the frame piece 31, the link 30 is bent or otherwise formed with a shoulder 34 which is adapted to engage a universal bar 35 supported at its ends by arms 36 pivoted to the depending frame pieces 16 at 37. The



universal bar 35 is held in its normal position by a spring 38 connected at one end to said universal bar and at the other end to a portion of the framework. The universal bar is connected by a link 39 to the dogs 40 which are pivoted to the framework at 41 and co-operate with an escapement wheel 42 mounted on a shaft 43. A pinion 44 is loose on said shaft and meshes with a gear 45 journaled on a stud projecting from the framework and connected to a pinion 46 which meshes with a gear 47 fixedly secured on the shaft 48 on which the roller 14 is mounted and to which said roller is secured by a pin 49 passing through said roller and said shaft. The shaft 48 may advantageously be journaled in the framework of the carriage by ball bearings 50 and 51. A pinion 52 is fixed on the shaft 48 or, as shown in the present instance, on the hub of the wheel 14, and said pinion engages a rack bar 53 which is secured to the side of the rail 12 by screws 54 (Fig. 2). One of the end pieces of the line-space frame has projecting therefrom a plate or frame portion 55, and a spring drum 56 is supported on a stud or headed screw 57 depending from said frame piece 55. A cord or belt 58 is secured at one end to said spring drum and passes over a pulley 59 journaled in ears 60 depending from the rail 12, and is connected at 61 to an arm 62 secured to the frame of the carriage 9. The spring drum 56 thus tends to draw the carriage to the right. The motion of the carriage under the impulse of said spring is controlled by the pinion 52 engaging the rack bar 53 and said pinion is controlled in turn by the escapement mechanism acting through the train of gears which has been described. It will be understood that upon the depression of any key, the link 30 draws the universal bar 35 towards the back of the machine and oscillates the dogs 40, and thus permits a step-by-step motion of the carriage. The pinion 44 is loose on the shaft 43 and has a hub 63 formed with one member of a ratchet-toothed clutch as shown in Figs. 3 and 4, and a sleeve 64 slidably mounted on the shaft 43 has the other member of said clutch. The sleeve 64 is formed with an internal annular shoulder 65 and the shaft 43 is formed with a corresponding shoulder 66, and a spring 67 is coiled about the shaft 43 and is compressed between said shoulders and presses the sleeve 64 toward the back of the machine, thus normally holding the clutch members in engagement. Pins 67 project from said sleeve 64 into openings in the escapement wheel 42 and prevent relative rotation of said sleeve and said escapement wheel. The construction is such that the escapement wheel and the clutch hold the carriage against motion to the right; but if the carriage be grasped and drawn to the left, the ratchet toothed clutch yields,

compressing the spring 67, and permits the train of gearing to rotate.

The shaft 48 is extended backward past the ball bearing 50 and has secured thereon a collar 68 formed on its end with ratchet teeth forming one member of a clutch, the other member of which is carried by a pinion 69 loosely supported on the shaft 48. Said pinion 69 meshes with a gear wheel 70 fixed to a sleeve 71 journaled on a stud 72, projecting from the framework of the carriage as shown. In the present instance, the end of the stud 72 is threaded into said framework, as shown in Fig. 4. The sleeve 71 is retained in position on the stud 72 by a headed screw 73 threaded into the end of said stud. The sleeve 71 is formed with an annular shoulder 74 and beyond said shoulder said sleeve is adapted to receive a ribbon spool 75. The head of the screw 73 is not broad enough to interfere with putting the spool on the sleeve and removing it. A spring 76 is fixed in a slot or key-way in the sleeve 71 and is bent upward at its free end as shown in Fig. 4. The ribbon spool comprises two flanges connected by a hub or core, which has one or more notches 77 formed in one end thereof, and one or more notches 78 in the other end thereof (Figs. 4, 8 and 9). When the ribbon spool is pushed onto the sleeve the upwardly bent end of the spring 76 is adapted to snap into one of said notches, thus holding the ribbon spool in place and also acting as a key to prevent relative rotation of said sleeve and said ribbon spool. The ribbon spool, being provided with a notch on each side thereof, is reversible. A flat friction spring 79 (Fig. 4) is compressed between the gear 70 and the framework. This spring serves to prevent backward rotation of the gear 70 when the carriage is drawn to the left, and also serves to insure a proper tension on the ink ribbon when said ribbon is being drawn off of the spool 75.

The escapement mechanism, pinion 52, wheel 14, and shaft 48 are inclosed in a housing 80 secured to or forming part of the framework of the carriage. It will be observed, more especially by reference to Figs. 1 and 2, that the escapement and ribbon mechanism so far described, are situated at the extreme right hand side of the carriage, and that the key mechanism and type mechanism are thus left free to occupy the entire central part of said carriage. On the left hand side of said carriage another housing 81 incloses a shaft 82 which is journaled in a manner similar to the shaft 48 and to which the wheel 13 is secured. A pinion 83 is secured to said shaft 82 or to the wheel 13, and said pinion engages the rack 53 in a manner similar to the pinion 52. The shaft 82 projects beyond its housing and carries a clutch member 84, the other member of said clutch



being carried by a pinion 85 which engages a gear wheel 86 fixed upon a sleeve 87 which is journaled on a stud upon which it is retained by a headed screw 88, all in a manner similar to the corresponding parts on the other side of the carriage. The wheel 86 has co-operating therewith a friction spring 89 similar to the spring 79, and a ribbon spool 90 is connected to the sleeve 87 in the same manner as the ribbon spool 75 to the sleeve 71. As far as the ribbon feed is concerned, the pinions 52 and 83 might be dispensed with, if preferred, and the spools be driven by the rollers 13 and 14.

The ink ribbon 91 passes from the spool 90 in a downward direction to a ribbon guide 92, from this to another guide plate 93, thence to a guide plate 94, and thence upward to the spool 75. The guides 92 and 94 are here shown as plates of sheet metal suitably formed and secured to the framework of the carriage by screws 95 (Fig. 1). As best shown in Figs. 1 and 3 the guide plate 93 is hinged at 94 to a depending portion of the framework which is here shown as a plate of metal 96 secured to the framework by screws. A portion of the plate 93 is bent as shown at 97 and engages the front face of the plate 96 to prevent the plate 93 from dropping too far when the carriage is lifted from the platen. A lug 93<sup>a</sup> on the under side of the plate 93 (Fig. 3) is adapted to rest on the paper and hold the ribbon at a suitable height above the same. As best shown in Fig. 1, the sleeve 87 is shorter than the sleeve 71 and is of such a length that the portion of the ribbon extending from the guide plate 92 to the guide portion 98 of the plate 93 is below the line of writing. The ribbon is bent by said guide portion 98 at about a right angle, into a line extending toward the back of the machine and crossing the printing point, to another guide portion 99 by which the ribbon is again bent at a right angle and from which it extends to the guide plate 94. The position of the printing point is indicated in Fig. 1 by the type bar 27. It will be observed that the part of the plate 93 which connects the guides 98 and 99 extends to the right of the printing point, and that said plate 93 is cut away at the left of the printing point. The construction is such that after being written the characters are quickly exposed by the feed of the carriage to the right. In order that each character shall thus come into view as quickly as possible, I prefer to arrange the guide plate 93 so that the printing point shall be beneath a portion of the ink ribbon near the left hand edge thereof, as indicated in Fig. 1. This being the case, only half of the ink ribbon will be brought into use as said ribbon is drawn step-by-step through the machine, and it is chiefly for this reason that I have so constructed the spools

75 and 90 that they can be reversed on their spindles. By making the spools reversible I am enabled, when one edge of the ribbon becomes worn, to reverse said ribbon in the machine to use the other edge thereof without disconnecting it from the spools. The type bars 27 are supported on the ring 26 in an arc which constitutes the greater part of a circle, the open part of said circle being in front. Said type bars normally stand in the upright position shown in Figs. 2 and 3 and rest against a pad 100 supported by an arc-shaped frame piece 101 in the well-known basket arrangement. Said frame piece and pad are cut away in the front part of the basket and the top of said basket is left open and the upper part of the frame plate 15 is also cut away as shown at 102 (Figs. 1 and 2). It will be seen that the disposition of the parts is such that the writing is visible to the operator.

The upper ends of the type bars are covered, or partially so, by an arc-shaped plate 103 which rests on the top of the carriage frame or casing and is held in position by shouldered screws 104 passing loosely through slots 105 in said plate 103 and threaded into the top of the carriage frame. The plate 103 is cut away or interrupted at the front of the machine like the other parts above referred to, and the edges thereof near the ends are bent downward as shown in Fig. 2 and have slots 106 through which pass shouldered screws 107, threaded into the framework of the carriage. The ends of the plate 103 are bent downward as shown in 108 in Figs. 2 and 3. The construction is such that by pressing on one of the downwardly projecting portions 108 the plate 103 may be slid back and forth on the top of the carriage for a short distance limited by the length of the slots 105 and 106. It will be observed that this motion of the plate 103 is in the nature of an oscillation. The plate 103 is formed with a recess at 109 on the left hand side of the basket and with another at 110 at the right hand side of said basket. In the present instance the plate 103 is formed of sheet metal and has its outer edge bent downward to engage the top of the casing of the carriage, and said sheet metal is stamped up at 109 and 110 to form the recesses referred to. Said recesses are adapted to receive the ends of arms 111 and 112 fixed to rock shafts 113 and 114 as by pins 115 extending through the hubs of said arms and through said rock shafts. Each of said rock shafts 113 and 114 is journaled at its upper end in the framework of the carriage and its lower end in a lug 116 projecting from said framework. Endwise motion of said shafts is prevented by the hubs of the arms 111 and 112 and by collars 117 fixed to said shafts below said lugs 116. Each of said rock shafts has pro-



jecting therefrom an arm 118, the end of which extends between annular flanges 119 and 120 of the pinions 69 and 85. Each of said arms 118 has fixed to one side thereof, as by rivets 121, (Figs. 6 and 7), a tongue 122 of resilient material, and said spring tongue also extends between the flanges 119 and 120. The construction is such that if the arm 118 be rocked toward the front of the machine the end of said arm engaging the flange 119 positively presses the clutch teeth on the pinions 85 or 69 out of engagement with the clutch teeth on the collars 84 or 68; but if said arm be oscillated toward the back of the machine the spring tongue 122 engaging the flange 120 presses said clutch teeth into engagement. The pinions 69 and 85 are formed broad enough for this motion to take place without disengaging said pinions from their gears 70 and 86. It will be observed by reference to Fig. 1 that when the plate 103 is moved to bring one pair of clutch members into engagement the same movement brings the other pair of clutch members out of engagement. The use of the spring tongue 122 will be readily understood. In case the clutch teeth do not happen to be exactly in register at the moment when the arm 118 is moved toward the back of the machine, said spring is put under tension, and as soon as the parts begin to turn, it presses the clutch teeth into proper engagement; also said spring yields and permits the clutch to act as a ratchet when the carriage is drawn toward the left. When the carriage is thus drawn toward the left, the friction springs 79 and 89 prevent the ribbon spools from turning backward.

Each of the ribbon spools 75 and 90 has pivoted to one side thereof at 123 an arm 124, preferably of more or less resilient material. A portion 125 (Fig. 10) of said arm is bent to one side and extends inwardly through an opening 126 in the side of the ribbon spool. The edges of the inwardly extending portion 125 may be serrated and bent toward the hub of the ribbon spool as shown at 125' in Fig. 10 in order to engage the ink ribbon 91 and clamp the same to said hub, as shown in Fig. 8. The arm 124 is formed with a lug or projection 127 which is adapted to snap into an opening 128 in the side of the ribbon spool to retain the arm 124 in its clamping position. This ribbon clamp may be conveniently formed of sheet metal, in which case the projection 127 may be stamped in the metal.

Various changes in the details of construction and arrangement may be made without departing from the gist of my several improvements.

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

1. The combination with a ribbon spool, of

driving means for said ribbon spool including a clutch, one member of which is slidable into and out of engagement with the other and is formed with a groove, a shifting arm extending into said groove and having a spring tongue, said arm being adapted to engage one of the walls of said groove to slide said clutch member out of engagement with its fellow and said spring tongue being adapted to engage the other wall of said groove to slide said clutch member into engagement with its fellow.

2. The combination of a ratchet toothed clutch, one member of which is slidable into and out of engagement with the other, of a shifting device adapted when operated in one direction to positively shift said slidable member out of engagement with its fellow and when operated in the other direction to press said slidable member only yieldingly into engagement with its fellow; and a ribbon spool adapted to be driven by said clutch when its members are in engagement.

3. The combination of a shaft having one member of a ratchet toothed clutch fixed thereon, a pinion slidably mounted on said shaft and having the other member of said clutch, annular flanges projecting beyond the teeth of said pinion, a shifting arm having a spring tongue, said arm and tongue extending between said flanges, said arm being adapted to engage one of said flanges to positively disconnect said clutch members when operated in one direction and said tongue being adapted to engage the other of said flanges to yieldingly press said clutch members into engagement with said arm when operated in the other direction; a gear meshing with said pinion, and a ribbon spool operatively connected to said gear.

4. The combination with a type basket, of ink ribbon spools on opposite sides of said basket, means for actuating said ribbon spools to feed the ribbon, and a reversing device including a member arranged to be shifted bodily substantially concentrically of said type basket to reverse the feed of the ink ribbon.

5. The combination with a platen and a series of type bars arranged to strike said platen at a common point, of ribbon spools on opposite sides of said printing point, means for actuating one or the other of said ribbon spools to feed the ribbon, an arc-shaped member extending around the printing point and mounted to be shifted bodily concentrically of the type basket, and ribbon feed reversing devices connected to said arc-shaped member.

6. The combination with a type basket, ribbon spools on opposite sides of said type basket, driving means for said ribbon spools for imparting a feed to the ink ribbon, a clutch for each of said driving means, shift-



ing devices for said clutches and an arc-shaped member spanning said type basket and adapted to be moved in the arc of a circle, and shifting devices for said clutches adapted to be operated by the movement of said arc-shaped member.

7. The combination of a series of type arranged in a basket about the printing point, ribbon spools on opposite sides of said basket, a plate extending over said basket and mounted to be rotated concentrically of said basket, and ribbon feed reversing devices connected to said plate.

8. In a ribbon spool, the combination with the core and flanges of an arm pivoted to one of said flanges on the outer side thereof, a clamping member projecting from said arm through an opening in said flange, and a spring detent between the flange and the arm for retaining said clamping member in clamping position.

9. In a ribbon spool, the combination with a core and a flange, of a resilient arm pivoted to said flange on the outer side thereof, a clamping member extending from said arm through an opening in said flange, and cooperating latch members on said arm and flange adapted to hold said clamping member in clamping position.

10. In a typewriting machine, the combination of a frame having a rack bar mounted thereon, a carriage adapted to move back and forth over said frame, an escapement mechanism having connected thereto a pinion which engages said rack bar to control the motion of the carriage, a ribbon spool actuated by said pinion, a second ribbon spool actuated by a wheel engaging a portion of said frame, and means for guiding an ink ribbon from one of said spools to the other.

11. In a typewriting machine, the combination of a rotary spindle; a spring key mounted on said spindle; a ribbon spool adapted to be mounted on said spindle and having at each end thereof a notch adapted to be engaged by said spring key to retain said ribbon spool in place and to cause said ribbon spool and spindle to turn together, the construction being such that said ribbon spool is reversible on said spindle.

12. In a typewriting machine, the combination of a carriage; supporting shafts for said carriage; clutch members rigidly mounted on said shafts; pinions loosely mounted on said shafts and provided with clutch members and adapted to slide into and out of engagement with said rigidly mounted clutch members; and ribbon spools geared to said pinions.

13. In a typewriting machine, the combination of a stationary platen; a carriage having printing instrumentalities mounted therein, said carriage being mounted for motion across said platen; ribbon spools mounted on

said carriage; and a ribbon guide for guiding the ribbon past the printing point, said guide being hinged to said carriage and being provided with a contact part adapted to engage the paper to prevent contact therewith of the ink ribbon and said guide also being provided with means for limiting the downward motion thereof when the carriage is raised above the platen.

14. In a typewriting machine, the combination of a platen, printing instrumentalities, and ribbon mechanism, said ribbon mechanism comprising a pivoted ribbon guide adapted to guide an ink ribbon across the printing point and a contact part on said ribbon guide for engaging the paper to prevent contact therewith of the ink ribbon.

15. In a typewriting machine, the combination of a stationary platen, a carriage having printing instrumentalities mounted therein, said carriage being mounted for motion across said platen, ribbon spools mounted on said carriage, and a ribbon guide for guiding the ribbon past the printing point, said guide being hinged to said carriage and being provided with a contact part for engaging the paper to prevent contact therewith of the ink ribbon.

16. In a typewriting machine, the combination of a stationary platen, a carriage having printing instrumentalities mounted therein, said carriage being mounted for motion across said platen and being also adapted to be raised away from said platen, ribbon spools mounted on said carriage, and a ribbon guide for guiding the ribbon past the printing point, said guide being hinged to said carriage and also being provided with means for limiting the downward motion thereof when the carriage is raised from the platen.

17. In a typewriting machine and in ink ribbon mechanism, the combination of means for guiding an ink ribbon across the printing point in a direction up and down the page of writing, types adapted to strike said ribbon near one edge thereof, and a pair of spools for said ribbon, said ribbon spools being reversible so as to bring the other edge of the ribbon into use.

18. In a typewriting machine and in ink ribbon mechanism, the combination of types adapted to strike at a common printing point, two ribbon spools mounted on opposite sides of the printing point, and ribbon guides for guiding the ribbon from one spool to the other in an off-set path such that the part of the ribbon that covers the printing point extends in a direction up and down the page of writing and such that a part of the ribbon near one edge thereof is led over the printing point, said ribbon spools being reversible so as to bring the other edge of the ribbon into use.



19. In a typewriting machine, the combination of a stud having a head, a hub confined by said head and revoluble upon said stud, said hub having a slot, and a yielding  
5 detent protruding from said slot, and a ribbon spool having in its core an opening to be engaged by said detent.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 30th day of December, A. D. 1904.

ALEXANDER T. BROWN

Witnesses:

REBECCA M. SMITH,  
MYRTLE L. EATON.