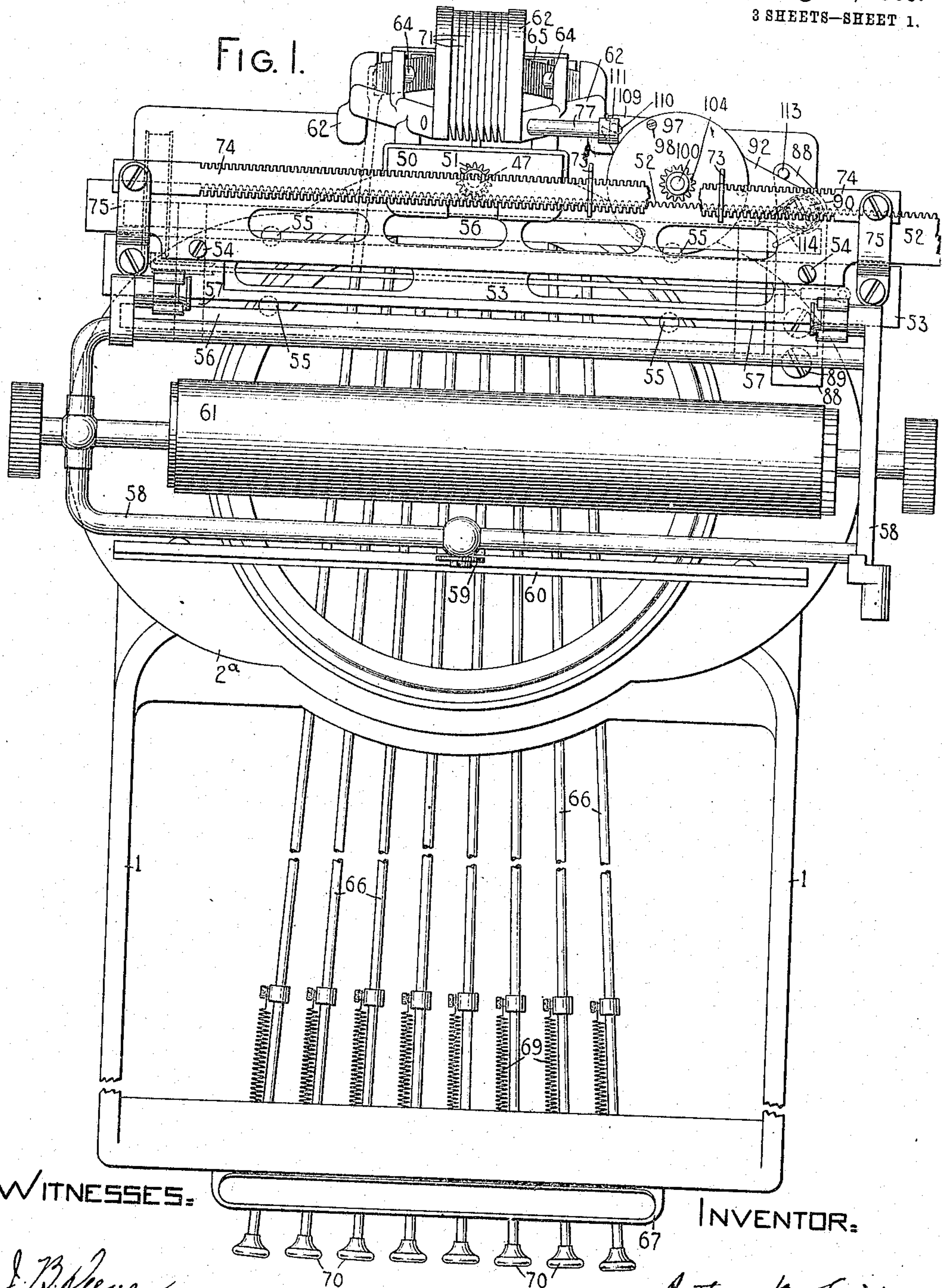


A. W. SMITH.  
TYPE WRITING MACHINE.  
APPLICATION FILED MAR. 1, 1906.

930,625.

Patented Aug. 10, 1909.  
3 SHEETS—SHEET 1.



WITNESSES:

J. B. Reeves  
m. v. Pool

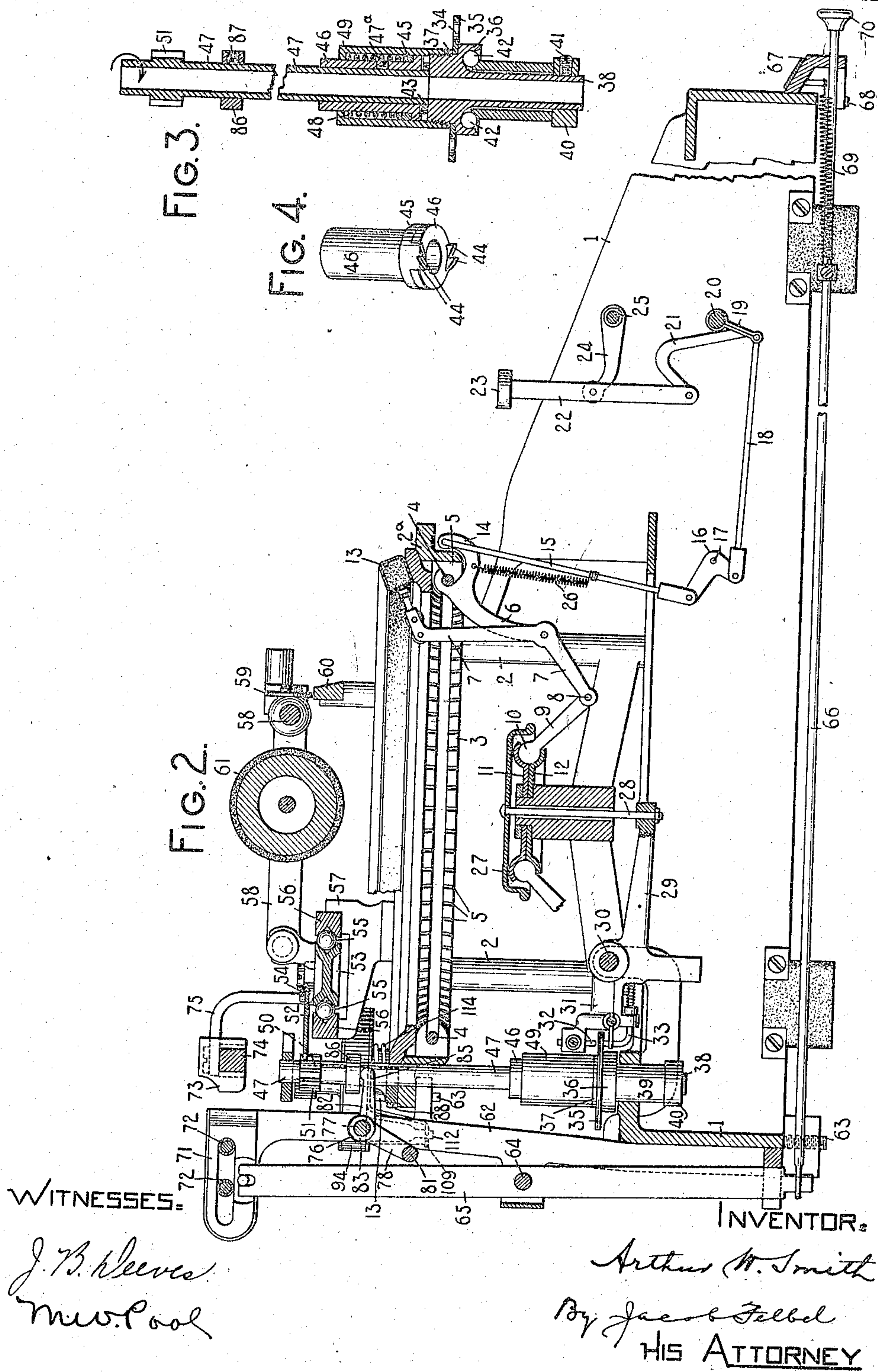
INVENTOR:

Arthur W. Smith  
By Jacob F. Feltel  
HIS ATTORNEY

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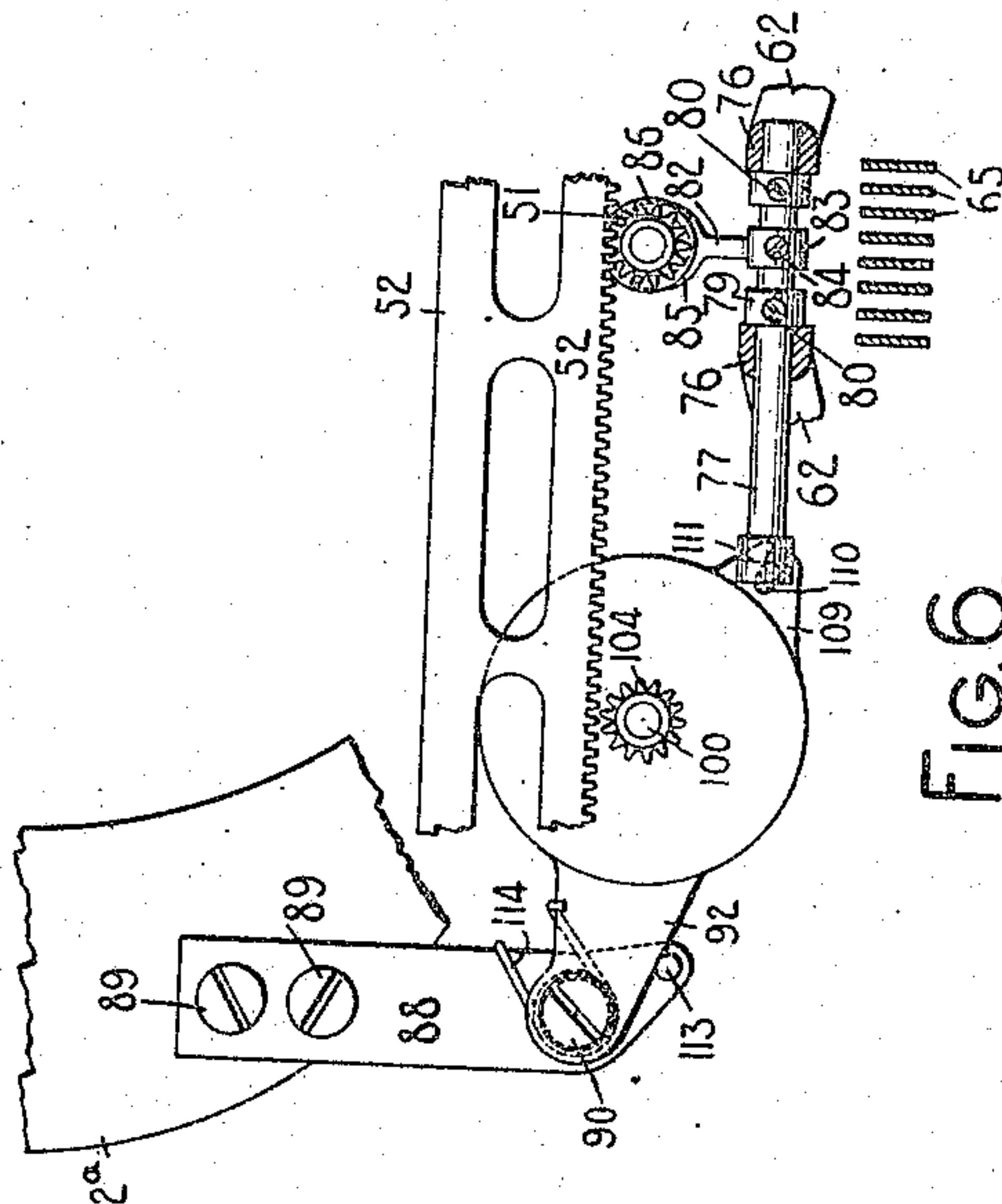
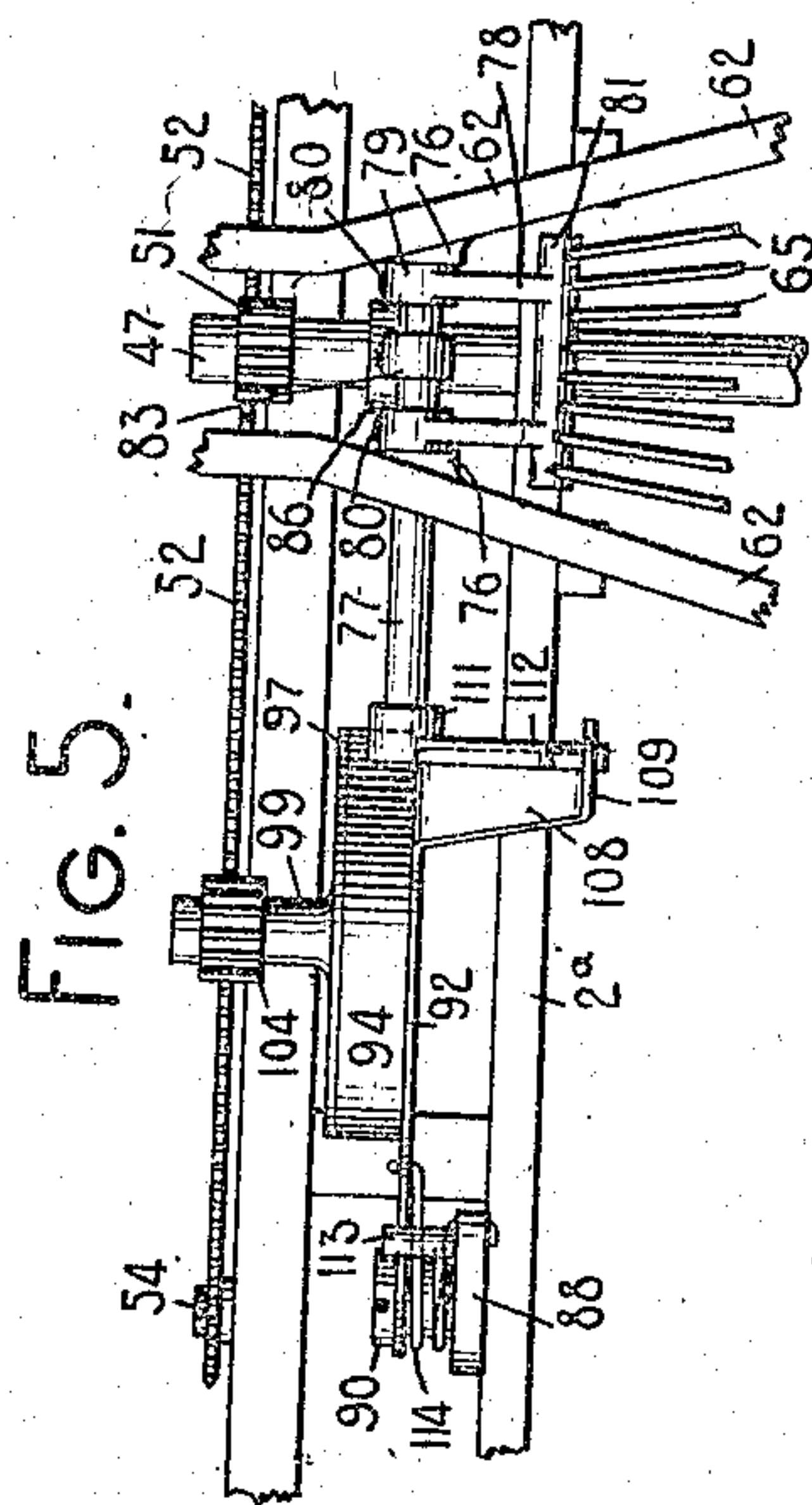
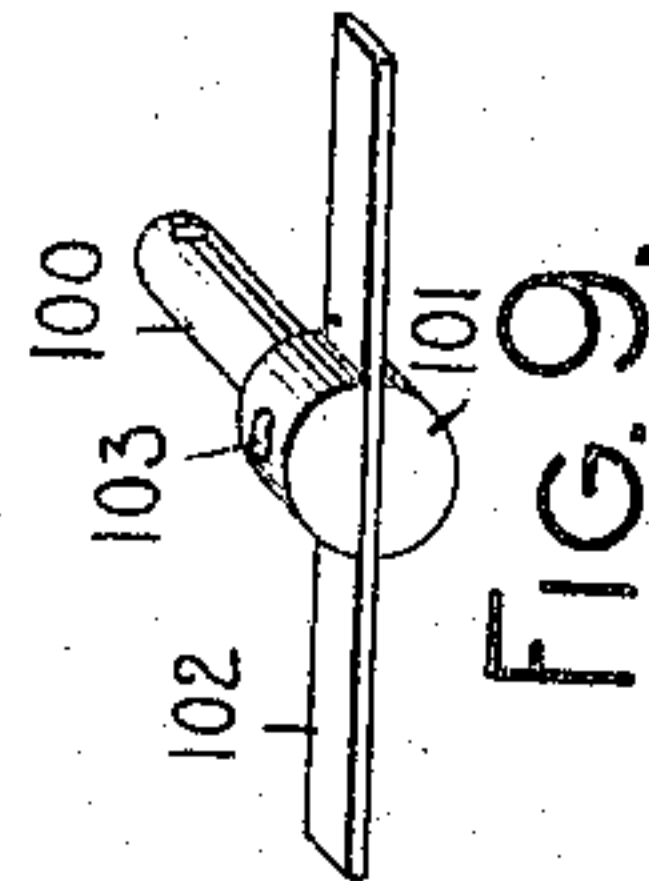
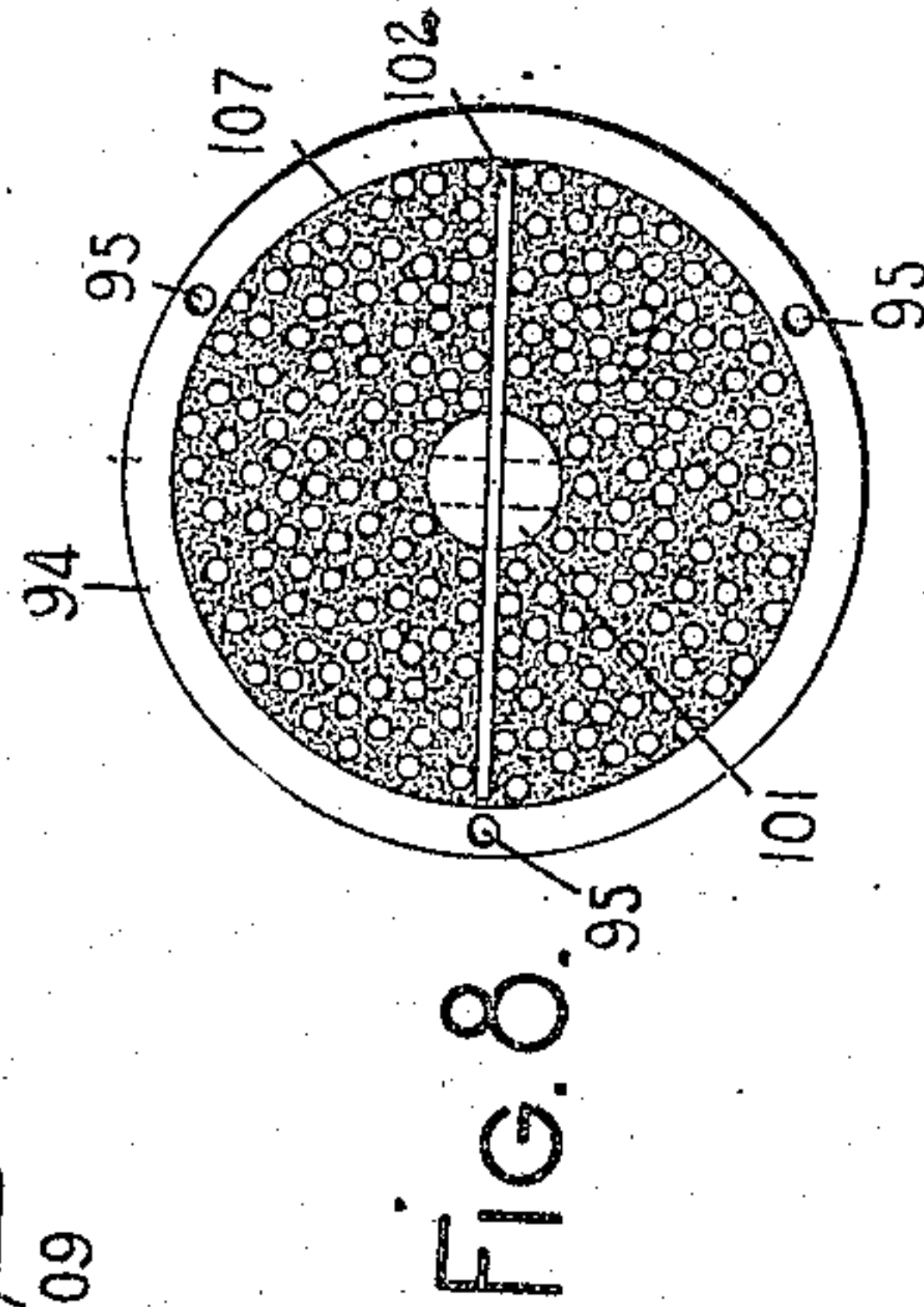
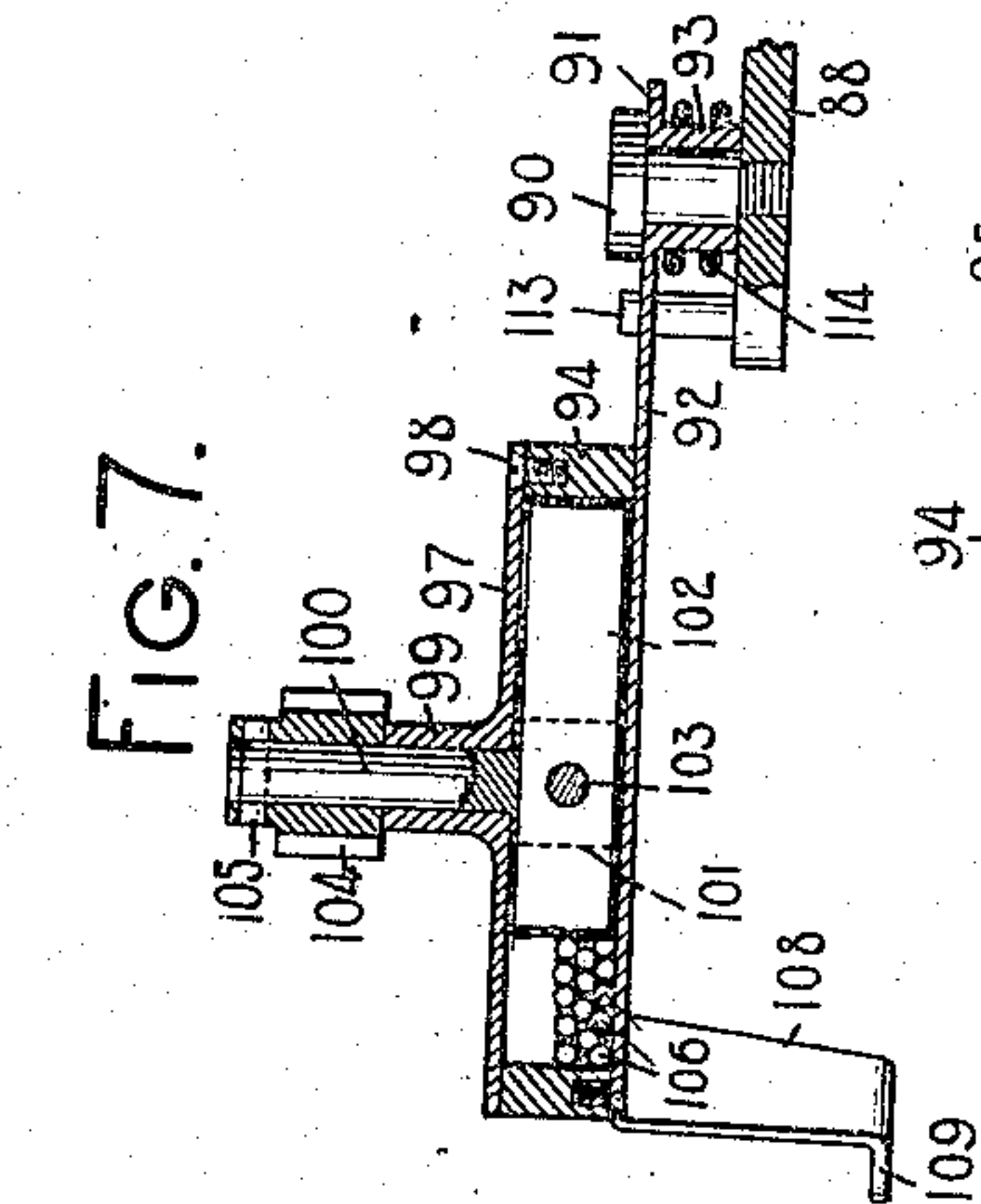




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TYPE WRITING MACHINE.  
APPLICATION FILED MAR. 1, 1908.

Patented Aug. 10, 1909.  
3 SHEETS—SHEET 3.



WITNESSES:

J. B. Reeves  
m. w. Pool

INVENTOR:

Arthur W. Smith  
By Jacob Felbel  
HIS ATTORNEY



# UNITED STATES PATENT OFFICE.

ARTHUR W. SMITH, OF NEW YORK, N. Y., ASSIGNOR TO YOST WRITING MACHINE COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

No. 930,625.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed March 1, 1906. Serial No. 303,654.

*To all whom it may concern:*

Be it known that I, ARTHUR W. SMITH, citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York 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 carriage-retarding mechanism for typewriting machines, and has for its object to provide an improved device of the class specified.

To the above and other ends the invention resides in the features of construction, combinations of devices and arrangements of parts hereinafter fully described and particularly pointed out in the claims.

I have illustrated my invention as applied to a typewriting machine generally resembling that commercially known as the No. 10 Yost typewriter, and in connection with a tabulating mechanism generally resembling that commonly known as the Gorin tabulator. It is to be understood, however, that my improvements may be readily adapted to other forms of typewriting machines and other styles of tabulating devices.

In the accompanying drawings in which like reference characters indicate corresponding parts in the various views:—Figure 1 is a fragmentary top plan view of a typewriting machine embodying my invention, parts being omitted. Fig. 2 is a fragmentary longitudinal sectional view taken about centrally of the machine, parts being omitted. Fig. 3 is an enlarged detail sectional view of the escapement wheel and its bearing and of the clutch mechanism. Fig. 4 is an enlarged perspective view of one of the parts of the clutch mechanism. Fig. 5 is a fragmentary rear elevation showing my improved retarding device in connection with the upper part of the typewriting machine and tabulating mechanism, parts being omitted. Fig. 6 is a fragmentary top plan view of the parts shown in Fig. 5, the tabulator blades and the bearing of the release rock-shaft being shown in section. Fig. 7 is an enlarged longitudinal sectional view of the improved retarding device, parts being omitted and broken away. Fig. 8 is an enlarged bottom plan view of a part of my improved retarding mechanism with the supporting plate thereof removed. Fig. 9 is an enlarged perspective view of a part of my improved retarding device, said

part being hereinafter termed a double rotary blade.

In the drawings, 1 indicates the base of the machine sustaining corner posts 2 on which is secured a top plate 2<sup>a</sup> supporting a ring 3. Pivoted at 4 in radial slots 5 formed in the ring 3 are drivers 6, each of which is pivotally connected with a type bar 7. Said type bar is pivoted at 8 to one end of the guide link 9, the other end whereof is formed with a disk-like portion 10. Circular plates 11 and 12, suitably fastened together and supported centrally of the type bar system, receive between them the disk-like portions 10 of the guide links. The types on the type bars 7 normally rest against an inking pad 13 supported on the ring 3. The driver 6 of each type bar is provided with an extension 14 which is connected with the upper end of a link 15, the lower end of said link being pivoted to one arm of a bell crank 16 fulcrumed at 17 on a stationary part of the machine. The other arm of the bell crank is connected by a draw link 18 with an actuating arm or blade 19 pivoted at 20 to a stationary part of the machine. Integral with the arm 19 is a curved arm 21, these arms forming an angular lever, and pivotally connected with the arm 21 is a key stem 22 provided with a key cap 23 and controlled in its up and down movement by a guide arm 24 having a stationary pivot 25. A contractile spring 26, having one end attached to the driver 6 and the other end to the link 15, assists in restoring the type bar actuating mechanism to normal position after the type bar, in a known manner, has been actuated to print. Above the circular plates 11 and 12, a circular universal bar 27 is so arranged that the guide links 9 are adapted to contact with it during the movement of the type bars toward the printing point. Under the influence of each guide link the universal bar 27 is raised at one side and lifts with it a headed rod 28 which rod passes loosely through a central opening in said universal bar. The lower end of the rod 28 is adjustably connected with the forward arm 29 of a dog carrier or rocker, which comprises in addition to said arm 29 a rock shaft 30 pivoted in the sides of the machine and a rearwardly extending arm 31. The arm 31 of the dog rocker carries a fixed dog 32 and a loose dog 33, said dogs being coöperative with escapement openings 34 formed in a



horizontally disposed escapement wheel 35 near its periphery. The escapement wheel, as best shown in Fig. 3, is supported on a rotary carrier 36 externally threaded to receive a nut 37, which maintains the escapement wheel in place against a shoulder on the carrier 36, the two being caused to rotate in unison. The carrier 36 has a depending hollow stem 38 which extends through a sleeve 39 fixed in an opening in the frame 1. Upward displacement of the carrier 36 is prevented by a collar 40 which is fixed to the depending stem 38 below the sleeve 39 by a set screw 41. The upper surface of the sleeve 39 and the opposing face of the carrier 36 are formed into ball races for the reception of anti-friction balls 42, thus providing a ball bearing for the escapement wheel. The upper end of the carrier 36 is formed with crown ratchet teeth 43 which cooperate with one or more ratchet teeth 44 projecting downwardly from a mutilated crown ratchet wheel 45 slidably mounted on a flanged collar 46 which surrounds the lower end of a vertically disposed hollow shaft 47 and is secured thereto by a set screw 47<sup>a</sup>. The teeth 44 are normally maintained in engagement with the crown ratchet teeth 43 on the carrier by a spiral spring 48 which surrounds the collar 46, the lower end of said spring abutting against the mutilated ratchet wheel 45 and the upper end thereof against a cap or housing 49 which fits down over said spring and is internally threaded at its lower end to cooperate with the threads on the carrier 36. The upper end of the hollow shaft 47 bears in a bracket 50 fixed to the top plate, and below said bearing said shaft is provided with a feed pinion 51.

The clutch mechanism above briefly described operatively connects the escapement wheel 35 with the feed pinion 51 and enables them both to rotate together in the direction of the arrow in Fig. 3, but permits the pinion 51 and shaft 47 to move independently of the escapement wheel when said shaft and pinion are turned in reverse direction. The pinion 51 meshes at all times with a horizontally disposed feed rack 52 projecting rearwardly from a carriage truck 53, it being fixed to said carriage truck by screws 54. The carriage truck, as best shown in Fig. 2, is provided with grooves at its front and rear edges, said grooves cooperating with anti-friction balls 55. Said balls also cooperate with oppositely disposed stationary track-ways 56 secured to a bracket 57 which is fixed to the top plate 2<sup>a</sup>. The carriage truck 53 is pivotally connected with a platen frame 58, the front of said platen frame being provided with a roller 59 which normally cooperates with a fixed track-way 60. The platen frame 58 and carriage truck 53 constitute a platen carriage.

A platen 61 is journaled in the platen frame

and the type bars 7 are adapted to cooperate with the under side of said platen frame.

The type actuating and carriage feeding mechanisms, the carriage, and the construction of the machine as thus far described, correspond generally to the No. 10 Yost typewriter, and as these features are the same substantially as those set forth and claimed in the pending applications of Charles W. Walker, Serial No. 128,470, filed Oct. 23rd, 1902, and Serial No. 86,821, filed December 21st, 1901, it is not deemed necessary to describe them herein with greater particularity.

Referring now to the tabulating mechanism, this may be of the ordinary form of construction. A supporting bracket 62 is secured to the rear of the machine frame by set screws 63, said bracket supporting a rod 64 which serves as a fulcrum for a set of vertically disposed vibratory levers 65. The lower end of each lever 65 is loosely connected with a horizontally disposed push rod 66, said push rod bearing in a detachable frame 67 secured at the front of the base by screws 68. Each push rod is provided with a helical restoring spring 69 and carries at its forward end a key button 70. The upper end of each lever 65 is connected by a pin and slot connection with a blade-like stop 71 mounted to slide fore and aft of the machine on roller bearings 72, said bearings being supported in the upper end of the bracket 62. As is well understood the blade-like stops 71 are arranged side by side a letter space distance apart and are adapted, when actuated, to cooperate with one or more stops 73 adjustably mounted upon a stop bar 74, said stop bar being disposed longitudinally of the platen 61 and secured to upwardly and rearwardly extending arms 75 fixed to the carriage truck 53. Somewhat below the stop blade 71 the sides of the bracket 62 are provided with inwardly projecting and oppositely disposed bosses 76 which are perforated to provide bearings for a horizontally disposed rock shaft 77. As indicated in Figs. 1, 5 and 6, the right-hand end of the rock shaft projects to a considerable extent beyond its bearings 76. The purpose of this extension of the rock shaft will presently appear. Arms 78 depend from the rock shaft 77, said arms being provided with perforated collar portions 79 through which the rock shaft 77 passes, the relation between said arms and said rock shaft being fixed by set screws 80. The arms abut against the inner faces of the bearing bosses 76 and are connected at their lower ends by a cross rod 81. Disposed between the arms 78 on the rock shaft 77 is a horizontally arranged arm 82, said arm being provided with a collar portion 83 through which the rock shaft 77 passes, a set screw 84 securing said arm in fixed relation with



said rock shaft. The forward end of the arm 82 is bifurcated or forked, the arms 85 of the bifurcation partially embracing the hollow shaft 47 and being adapted to co-operate with a collar 86 fixed to said shaft above said arms by a set screw 87. When any one of the push rods 66 is operated, its associate lever 65 is rocked on its pivot 64, the upper arm of said lever being swung forwardly, moving the stop blade 71 into the path of the stops 73 on the carriage. As the upper arm of the lever 65 swings forwardly it coöperates with the cross rod 81 rocking the shaft 77 and moving the bifurcated arm 82 upwardly, the latter acting through the collar 86 on the shaft 47. Longitudinal upward movement is thereby communicated to the shaft 47 and the members of the clutch-connection between the pinion 51 and the escapement wheel 35 are disengaged from each other, the teeth 44 of the mutilated ratchet wheel 45 separating from the crown ratchet 43. The teeth of the pinion 51 will remain in mesh with the teeth of the carriage rack 52, but will slide upwardly on said rack teeth, the pinion being elongated to permit of this upward movement. As soon as the clutch mechanism is disconnected the carriage is released and is free to be drawn rapidly leftward across the top plate by the usual carriage spring or propelling means (not shown herein), the free movement continuing until one of the carriage stops 73 co-acts with the projected stop blade 71.

In order to prevent undue shock or jar from the impact of the carriage stops 73 with the projected stop blades 71, I provide an improved carriage retarding means which will now be described. An arm or support 88 projects rearwardly from the left-hand side of the top plate, being secured thereto by headed screws 89. At its rear the arm 88 is provided with a threaded opening which receives a shouldered pivot screw 90, the body portion 91 of said screw serving as a bearing for a swinging plate or arm 92, the right-hand end of said plate being formed with a boss or hub 93 which is perforated to coöperate with the body portion 91 of the pivot screw (Fig. 7). To the left of its pivot the swinging plate 92 is broadened to provide a bottom or base for an annular member or ring 94 having threaded openings 95 for the reception of headed screws 96 which pass upward through the plate 92 and secure the latter and the ring 94 in fixed relation. The ring 94 is provided with a circular roof or cover 97 secured in place by headed screws 98 which pass through it and are received in threaded openings in the upper face of the ring 94. The cover 97 is formed with a central extension or boss 99 which is perforated to provide a bearing for a short vertical shaft 100. The lower end of said shaft is formed with a cylin-

drical enlargement 101 (Fig. 9) which is slotted or kerfed to receive a bar-like part 102, secured in place by a pin 103, driven through the enlargement 101, said bar-like part serving as a double blade in a manner hereinafter to be explained. The upper end of the shaft 100 receives a pinion 104 which is secured to the shaft by a cross pin 105. The top 97, ring 94 and base 92 constitute a casing or covered box within which the double blade 102 is adapted to be rotated. It will, of course, be understood that said blade, is, with its shaft 100, assembled in place within the casing or box before the cover 97 is secured to the ring 94. An alternative way of assembling the parts is first to secure the ring 94 and cover 97 together, after which the shaft 100, carrying the blade 102, may be assembled in its bearing and thereafter be secured in fixed relation with the pinion 104. In thus assembling the parts they will be turned upside down from the positions indicated in Fig. 7. When the parts are being assembled as last described, before screwing the bottom plate 92 in place a quantity of small, substantially spherical bodies are introduced into the casing. I prefer to use small steel balls for this purpose and such balls are shown in the drawings and indicated by the reference numeral 106. Mixed with the balls I prefer to employ a lubricating material, preferably friable in character. I have in practice found powdered graphite to be most satisfactory. In the drawings the lubricating material is indicated by the reference character 107. The most satisfactory results I have found to be obtained when the casing is about half full of balls and lubricating material. If it is desired to retard the carriage to a greater or less extent however, the quantity of balls may readily be increased or lessened. The balls and lubricating material having been introduced into the casing, the plate 92 may then be secured thereto by means of the screws 96. The left or inner end of the base plate 92 is provided with a downwardly extending arm 108, said arm having a horizontally disposed lip 109 which is formed with a slot 110 (Figs. 1 and 6). A collar 111 is driven or otherwise suitably secured on the end of the extended portion of the rock shaft 77, and integral with said collar and depending therefrom is a pin or arm 112 which engages with the slot 110 in the lip 109. A limiting pin 113 is fixed in the end of the arm 88 and projects upwardly therefrom. The rear edge of the swinging plate 92 is normally maintained against said limiting pin by a wire restoring spring 114 which is coiled around the hub 93 and has one end hooked over the swinging plate 92 and the other end hooked over the stationary supporting arm 88. With the swinging plate 92 in normal position against its limiting stop 113 it will



be noted from an inspection of Fig. 6 that the pinion 104 is disconnected from the rack 52.

Referring now to the operation of my improved retarding device, it will be understood that when the rock shaft 77 is rocked by one of the levers 65, the pin 112 on the end of said rock shaft will cooperate with the slotted lip 109 to swing the plate 92 forwardly about its pivot 90, bringing the pinion 104 into mesh with the carriage rack. The parts are proportioned so that the pinion 104 and rack 52 will be far enough in mesh to render the rack operative on the pinion before the clutch devices are unclutched to disconnect the feed pinion 51 from the escapement wheel 35. Consequently when the release of the carriage occurs, the rack 52 being engaged with the pinion 104 will turn the latter rapidly, thereby communicating rotary movement to the double blade 102. The movement of the blade is opposed by the balls 106 and the lubricating material, the balls tending to crowd together and pile up on one another, forming, with the lubricating material, at each side of the axis of rotation a compact mass filling the space next to and in front of the adjacent arm of the blade and pressing against the ring 94. These masses become more compact as the extent of movement of the arms of the blade 102 increases, and the result is that the free movement of the carriage is retarded so that the stop 73 is brought into co-action with the projected stop-blade 71 without excessive violence; and the carriage is arrested with but little shock or noise, while the speed of the carriage is not so decreased as to render the operation of the machine too slow. It will be understood, of course, that the bar or blade 102 may be replaced by any other rotary part of suitable construction. When the co-action between the carriage stop and the stop on the frame occurs the actuated tabulating key 70 is released and the push rod and its associate vibratory lever 65 are restored to their normal positions by the restoring spring 69, while at the same time the clutch devices are reconnected through gravity and the restoring spring 48, the teeth of the pinion 51 sliding down over the teeth of the carriage rack 52. The retarding device is restored to normal position through the action of its spring 114 which operates to restore the swinging plate 92 to the position shown in Fig. 6. The spring 48 also assists in thus restoring the retarding device to normal position, through the collar 86, arm 82, rock shaft 77 and pin 112, said pin acting on the lip 109 and tending to swing the plate 92 rearwardly.

As has been stated, the quantity of the balls 106 may be so governed that they will oppose the rotation of the blade 102 and retard the movement of the carriage to any desired degree. In practice I have found

most satisfactory results to be obtained by a mass of particles of solid matter of the particular character described; that is, a mixture of balls and a powdered or pulverized lubricant. The lubricant causes smooth and easy co-action of the balls with one another, but of course, if preferred, the balls may be employed alone. A powdered or pulverized material which, as has been described, is preferably a lubricant may also be employed separately and alone in the casing with good results, but by mixing metal balls with said material to give weight and body, the size of the casing and associate parts may be made smaller and the same results obtained as with a large casing and a large bulk or quantity of powdered self-lubricating material alone. Any self-lubricating solid other than graphite may, of course, be employed.

Various changes may be effected without departing from the spirit of my invention.

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

1. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing containing said arm; a mass of particles of solid matter confined in said casing, said casing providing a passage through which said mass may be swept freely by said arm as it turns on its pivot; and means for connecting said retarding arm with said carriage when the carriage is released.
2. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing containing said arm; a composite mass of particles of solid matter confined in said casing, said casing providing a passage through which said composite mass may be swept freely by said arm; and means for connecting said retarding arm with said carriage when said carriage is released.
3. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing for said arm; a composite mass composed of particles of powdered material and of particles of other solid matter, confined in said casing, said casing providing a passage through which said mass may be swept freely by said arm; and means for connecting said retarding arm with said carriage when said carriage is released.
4. In a typewriting machine, the combina-

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tion of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing for said arm; a composite mass of material including a quantity of small metallic bodies, said composite mass being confined within said casing, said casing providing a passage through which said mass may be swept freely by said arm; and means for connecting said retarding arm with said carriage when said carriage is released.

5. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing containing said arm; bodies substantially spherical in said casing, said casing providing a passage through which said bodies may be swept freely by said arm; and means for connecting said retarding arm with said carriage when said carriage is released.

6. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing wherein said arm rotates; balls in said casing, said balls being preferably of metal and said casing providing a passage through which said balls may be swept freely by said arm; and means for connecting said retarding arm with said carriage when said carriage is released.

7. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding blade normally disconnected from said carriage; a casing containing said blade; steel balls in said casing, said casing providing a passage through which the steel balls may be swept freely by said blade; and means for connecting said retarding blade with said carriage when the carriage is released.

8. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing containing said arm; a powdered material in said casing, said casing providing a passage through which said powdered material may be swept freely by said arm; and means for connecting said retarding arm with said carriage when said carriage is released.

9. In a typewriting machine, the combination with a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a pivoted retarding arm normally disconnected from said carriage; a casing containing said arm; a powdered lubricant in said casing, said casing providing a passage through which said powdered lubricant may be swept freely by said arm; and means for connecting said retarding arm with said carriage when said carriage is released.

10. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a rotary retarding blade normally disconnected from said carriage; a casing containing said blade; graphite in said casing cooperative with said blade; and means for connecting said retarding blade with said carriage when said carriage is released.

11. In a typewriting machine; the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a rotary retarding part normally disconnected from said carriage; a casing containing said rotary part; metal balls in said casing; a lubricant material in said casing with which said balls are mixed; and means for connecting said retarding part with said carriage when said carriage is released.

12. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a rotary retarding blade normally disconnected from said carriage; a casing containing said blade; metal balls in said casing; a powdered lubricant with which said balls are mixed; and means for connecting said retarding blade with said carriage when the latter is released.

13. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing or freeing said carriage from the control of its step-by-step feeding mechanism; a rotary retarding part normally disconnected from said carriage; a casing containing said rotary part; balls of metal, such as steel, mixed with graphite, the mixture being in said casing and cooperative with said rotary part; and means for connecting said retarding part with said carriage when said carriage is released.

14. In a typewriting machine, the combination of a carriage; step-by-step feeding mechanism therefor; means for releasing said carriage from its step-by-step feeding mechanism; a casing; a double rotary blade



5 pivoted centrally in said casing; a mixture  
 in said casing coöperative with said blade,  
 said mixture comprising a quantity of steel  
 balls and powdered graphite mixed there-  
 with; and means for connecting said blade  
 with said carriage when said carriage is  
 released.

10 15. In a typewriting machine, the combi-  
 nation of a carriage; a feed rack thereon; a  
 feed pinion constantly in mesh with said feed  
 rack; carriage feeding-mechanism; a clutch  
 connection between said pinion and said car-  
 riage feeding mechanism; tabulating devices  
 operative to effect the disconnection of said  
 15 clutch; a pivoted spring pressed supporting  
 arm; a stirrer pivoted on said arm and nor-  
 mally disconnected from said feed rack; a  
 casing on said arm; and a mass of balls in

said casing, said stirrer being operatively con-  
 nected with said feed rack by the operation 25  
 of said tabulating devices and thereupon co-  
 acting with said balls.

16. A retarding mechanism for typewrit-  
 ing machines comprising a casing containing  
 an admixture of powdered graphite and 25  
 weightier particles, and a rotary part co-  
 operative therewith to sweep said admixture  
 freely through said casing.

Signed at the borough of Manhattan, city  
 of New York, in the county of New York, 30  
 and State of New York, this 28th day of Feb-  
 ruary, A. D. 1906.

ARTHUR W. SMITH.

Witnesses:

E. M. WELLS,

J. B. DEEVES.