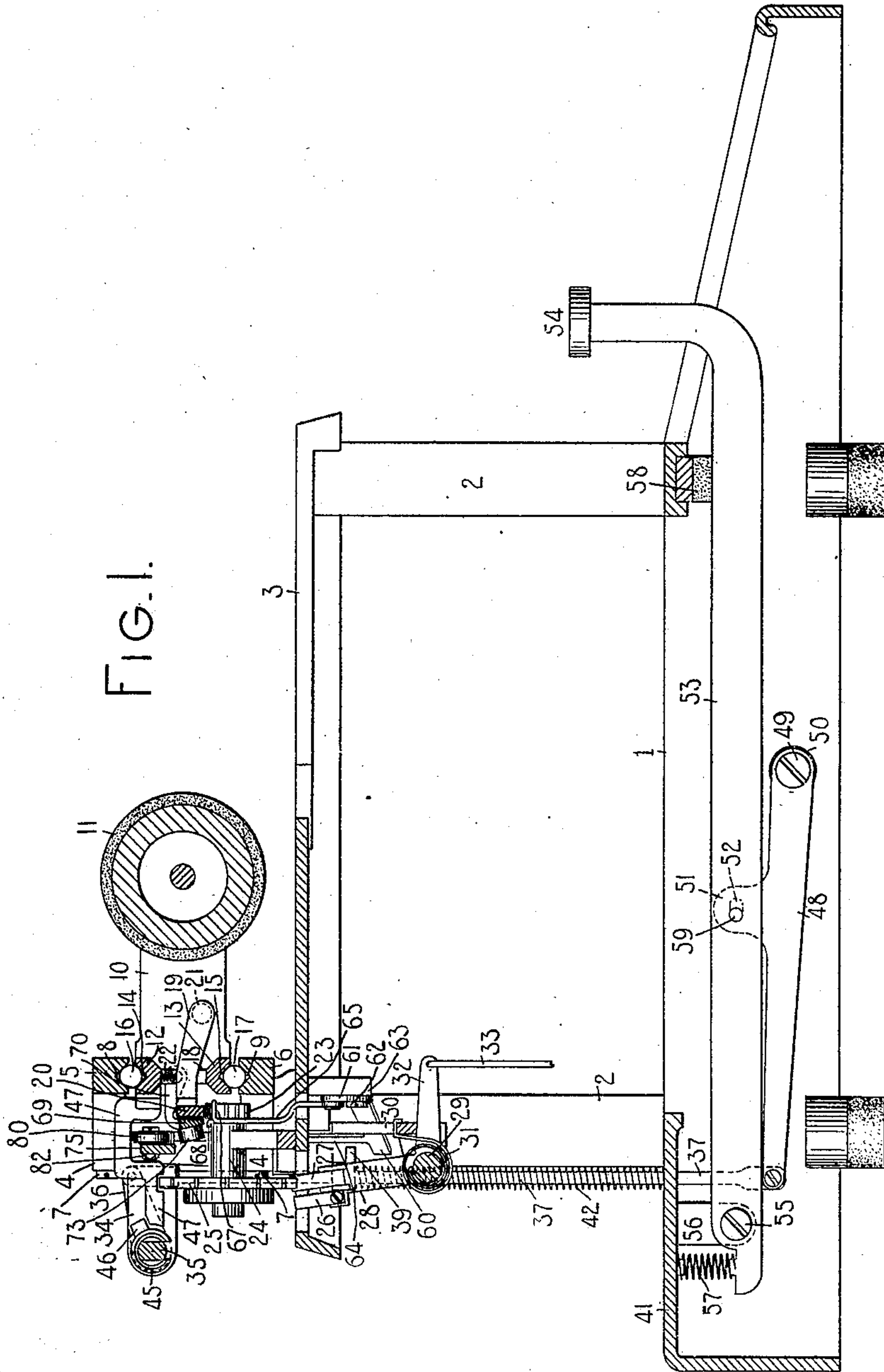


J. FELBEL.  
TYPE WRITING MACHINE.  
APPLICATION FILED FEB. 1, 1906.

898,636.

Patented Sept. 15, 1908.

3 SHEETS—SHEET 1.



WITNESSES:

*D. A. Carpenter.*

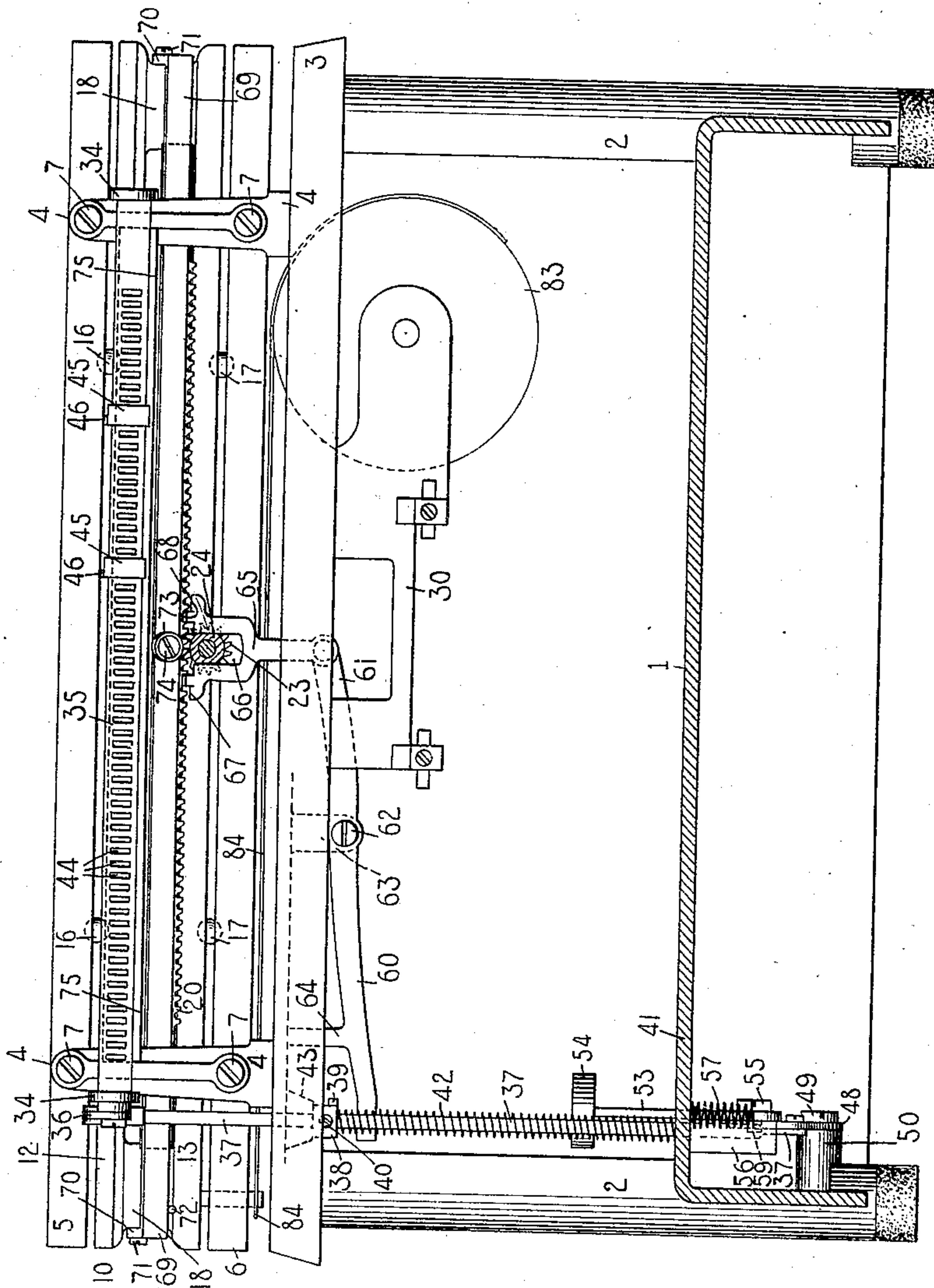
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3 SHEETS--SHEET 2.



210

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898,636.

Patented Sept. 15, 1908.

3 SHEETS—SHEET 3.

FIG. 3.

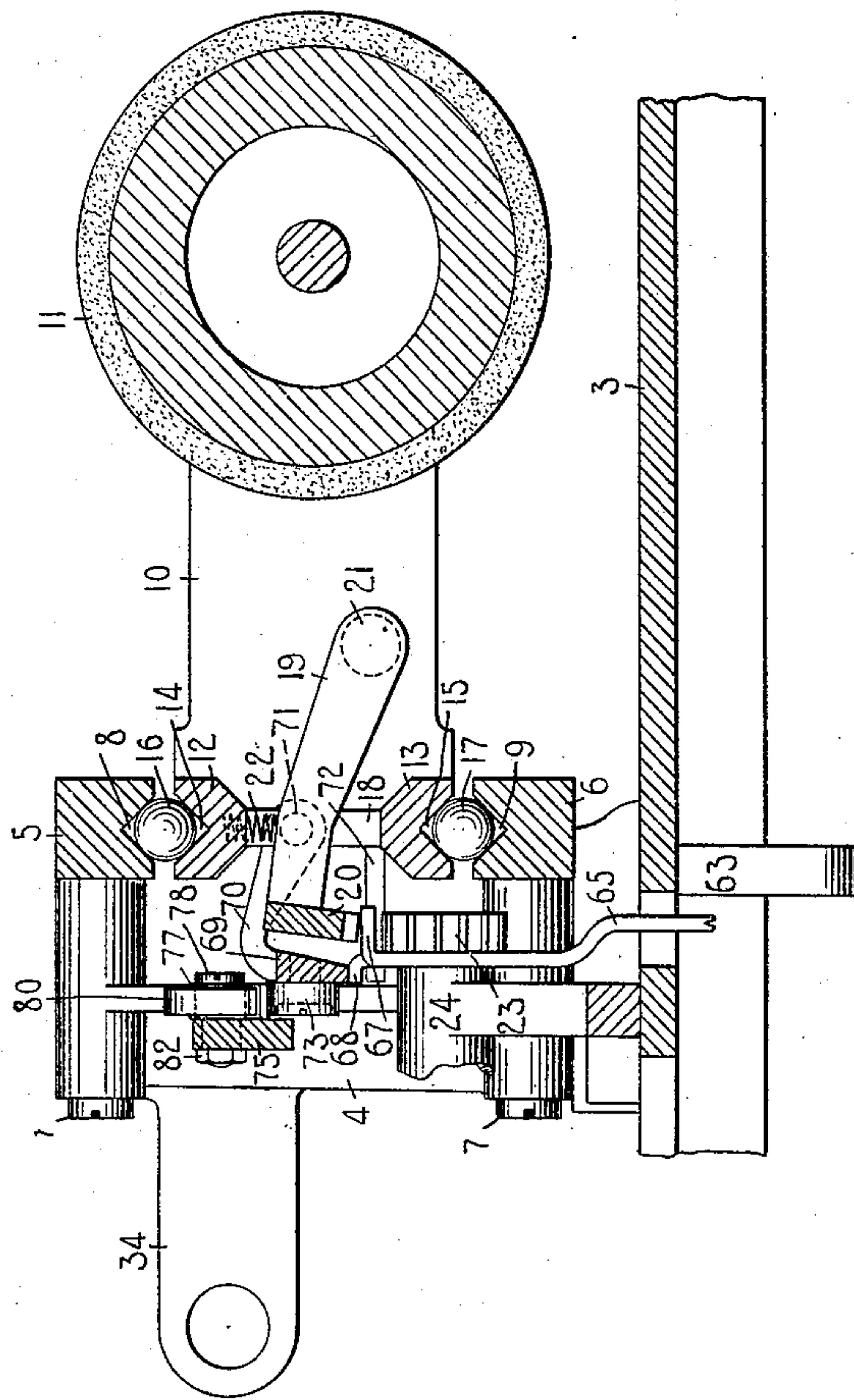
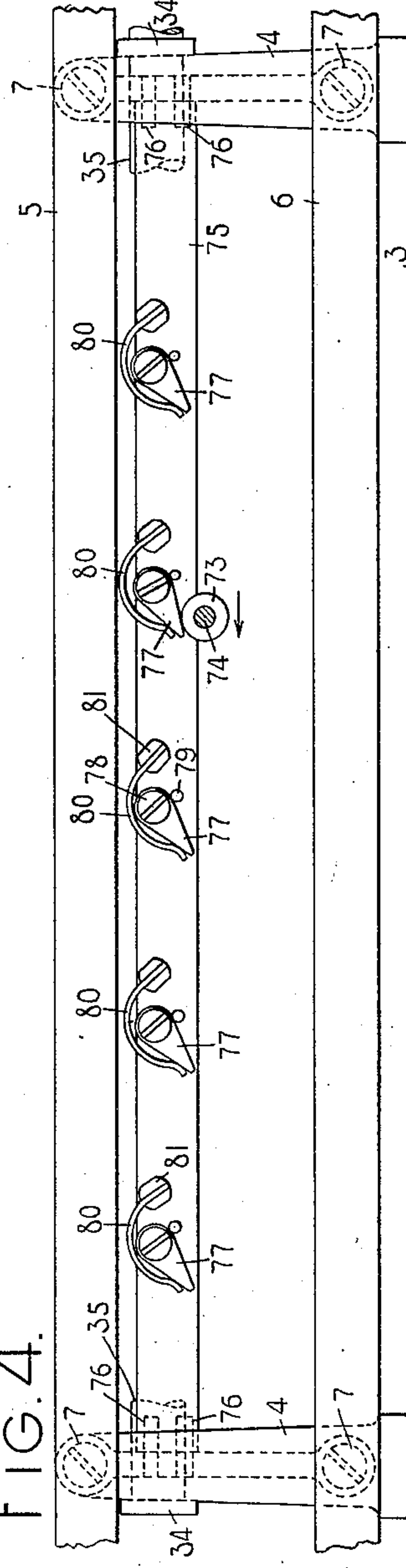


FIG. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JACOB FELBEL, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## TYPE-WRITING MACHINE.

No. 898,636.

Specification of Letters Patent.

Patented Sept. 15, 1908.

Application filed February 1, 1906. Serial No: 299,005.

*To all whom it may concern:*

Be it known that I, JACOB FELBEL, a 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.

This invention relates to retarding devices for the carriages of typewriting machines and consists in the features of construction and combinations and arrangements of parts, which are hereinafter described and specified in the claims.

In the accompanying drawings, in which like reference numerals designate like parts in different views, Figure 1 is a vertical section, at right angles to the axis of the platen, of the frame and part of the mechanism of a Monarch typewriting machine embodying the invention; Fig. 2, a rear and sectional elevation of the frame and part of the mechanism of the machine; Fig. 3, a vertical section on an enlarged scale showing some of the parts illustrated in Fig. 1; and Fig. 4, a front view of a fragment of the machine including parts of the carriage-retarding mechanism.

Although the drawings illustrate this invention applied to a Monarch machine, it is to be understood that the invention is also applicable to other machines, including such as are called "under-stroke" machines as well as "visible-writing" machines.

The carriage-retarding mechanism in which the invention is embodied comprises parts which are attached respectively to the carriage of the machine and to a fixed support behind the carriage. The frame of the machine is composed of a base 1, posts 2 and a top-plate 3 fixed on the posts by screws. On the back part of the top-plate 3 are two standards 4 which are fastened to the top-plate and to which upper and lower carriage guide-rails 5 and 6 are attached by screws 7, these guide-rails having in them grooves 8 and 9 extending throughout the length of the rails. The carriage 10, in which is mounted the platen 11, has formed on it grooved guides 12 and 13, which extend from end to end of the carriage, the grooves 14 and 15 of these guides forming with the grooves 8 and 9, of the rails 5 and 6, ball-channels in which are anti-friction balls or rollers 16 and 17. The carriage is thus secured to the rails 5 and

6 and is movable on the balls in opposite directions over the top-plate 3. The guides 12 and 13 are connected together by a web 18 and through holes in this web extend arms 19, which are pivoted to the ends of the carriage and to whose rear ends is affixed the carriage-rack 20 behind the web 18, the rack being movable up and down on the pivots 21 of the arms 19. Springs 22, acting on the arms of the rack, tend to keep the rack in the position in which it is shown in Fig. 1, that being its normal position.

The rack 20 normally engages a pinion 23, which is fast on a shaft having a bearing in a bracket 24 affixed to the top-plate 3, and on the rear end of this shaft is an escapement-wheel 25, which is arranged to co-act with the feed dogs 26 and 27 mounted on a dog rocker 28, whose rock shaft 29 is pivoted at its ends between lugs on a bracket 30 affixed to and extending downward from the top plate 3. On the rock shaft 29 is a spring 31 which tends to keep the stepping dog 27 in engagement with a tooth of the escapement-wheel 25. An arm 32, fast on the dog rocker, extends in front of the rock shaft 29 and to the front end of this arm is secured a link 33 which extends downward therefrom to the universal bar (not shown). Whenever the universal bar is actuated by depressing a character-key, or the space-key, the front end of the arm 32 is drawn downward by the link 33, the stepping dog 27 is swung forward free from the escapement wheel, and the holding dog 26 is moved into engagement with the escapement wheel, and when the universal bar rises after the key has been released, the stepping-dog 27 reengages with the escapement-wheel and the carriage advances a letter-space distance. But any other forms of escapement mechanism may be used in lieu of this.

Extending rearwardly from the standards 4 are arms 34, in which a stop-bar 35 is journaled at its ends. On the right end of this stop-bar (considered from the front of the machine), outside of the adjacent bracket 34, is a crank arm 36 which extends forward and a little upward from the stop-bar, and to which is pivoted in its forward end a rod or link 37, which extends downward through the top-plate and into the base 1 of the machine. A collar 38, having on it a projection 39, is fastened by a screw 40 to the rod 37, and on the rod 37, between the collar 38 and



the roof 41 of the base, is a coil-spring 42 which presses upward against the collar and tends to keep it in contact with the underside of the top-plate 3, or a boss 43 formed on the top-plate. The collar 38 is so attached to the rod 37 that the projection 39 of the collar extends laterally inward from the collar and rod. The stop-bar 35 has cut in it on opposite sides slots or recesses 44 at letter space distances apart, and on this bar are tabulator-stops 45 which fit in these recesses and which are adjustable on the bar, each tabulator-stop being formed to engage a recess at the back of the bar and another at the front of the bar. Each tabulator-stop has a lug 46 which extends forward and upward from the body of the stop, when the bar is in the position in which it is shown in the drawings, the bar being normally held in this position by the upward pressure of the spring 42 against the collar 38 on the rod 37. A stop 47, which is rigidly attached to the back of the carriage 10 about midway between the ends of the carriage, extends backward nearly to the stop-bar 44, its rear end being out of alignment with the lugs 46 of the tabulator-stops when the stop-bar is in the position shown in the drawings, and then being movable by the carriage past the stops 45 and under the lugs 46.

The rod 37 is pivoted at its lower end within the base to a lever 48, whose fulcrum is a screw 49 passing through its front end and into a boss 50 formed on the frame of the machine. On this lever is an upwardly extending ear 51 in which is a slot 52. A lever 53, having on it a key 54, is pivoted near its rear end by a screw 55 to a lug 56, formed on the under side of the part 41 of the base and extending downward therefrom, there being behind this lug a coil-spring 57 bearing against the key-lever and the part 41 of the base, and tending to keep the key-lever in its normal position in contact with a pad 58 near its front end. A pin 59, fixed on the key lever 53, extends through the slot 52 in the ear 51 of the lever 48. The construction is such that if the tabulator key 54 be depressed, the stop bar 35 will be rocked toward the front of the machine, bringing the lugs 46 into the path of the stop 47.

A lever having arms 60 and 61 is pivoted by a shouldered screw 62 to a lug 63 on the under side of the top-plate 3, the arm 60 of this lever extending in front of the rod 37 and under the projection 39 of the collar 38, and having on its upper edge a stop 64 which makes contact with the under side of the top-plate when the lever is in its normal position, or that shown in Fig. 2. To the arm 61 of this lever is pivoted a rack-lifting device 65, extending through a hole in the top-plate 3 and having in it a slot 66, whose edges fit in grooves formed in the bracket 24 immediately behind the pinion 23. On this

lifting device at its upper end are portions 67 and 68 bent forward and backward respectively from the body of the device, the portions 67 extending under the carriage rack 20, and being out of contact therewith when the rack is engaged with the pinion 23 and the device 65 is in its normal position as it is shown in Figs. 1 and 2.

The retarding-mechanism shown comprises a series of devices mounted on a fixed bar and a coöperative device mounted on the carriage of the machine. It is apparent, however, that for these particular devices modifications thereof may be substituted and that the arrangement of the devices may differ from the arrangement shown. The device which is mounted on the carriage is attached to a bar 69 having at its ends arms 70, which extend outside of the ends of the carriage and are pivoted to the carriage-frame by shouldered screws 71. This bar normally lies behind and close to the carriage-rack 20, and in contact with a stop pin 72 fixed in the carriage near the right end of this bar, the lower edge of the bar being immediately over and a short distance above the portions 68 of the rack-lifter 65, when this is in its normal position. The carriage-retarding device which is attached to this bar consists of a roller 73, mounted on a shouldered screw 74, which passes through the roller and into the bar midway between the ends of the bar, the roller being close to the back of the bar. The devices with which the roller 73 coöperates are mounted on a bar 75, whose ends abut against the inner faces of the standards 4 and which is attached to these standards by pins 76 passing through the standards into the ends of the bar. Each of these retarding devices is composed of an arm 77, pivoted by a shouldered screw 78 to the bar 75, and normally resting in contact with a stop pin 79 fixed in the bar, and of a spring 80, secured in a slot in a screw or bolt 81 which passes through the bar 75, and on which is a lock-nut 82 bearing against the back of the bar. These devices are arranged in a straight line on the bar 75, and the springs 80 bear upon the arms 77 near their lower or free ends and tend to keep said arms in contact with the stop-pins 79, as they appear in Fig. 4 of the drawings. The pressure of each of the springs 80 on the arm on which it acts may be regulated by turning the screw or bolt 81 and locking it by means of the lock-nut 82.

The machine contains a spring drum 83 which is connected by a strap 84 with the carriage, so that when the escapement is actuated, or the carriage-rack is raised out of engagement with the pinion 23, the carriage will be moved toward the left by the action on it of the spring-drum and strap.

When the tabulator-key 54 is depressed the stop bar 35 is turned on its axis by the



action of the lever 53 on the lever 48 and of the latter lever and the rod 37 on the crank arm 36, so that the lugs 46 on the tabulator-stops 45 are moved downward into alinement with the stop 47, which, as appears by Fig. 1, extends upward from the carriage in front of the bar 75 and then backward and downward behind this bar. At the same time the projection 39 on the collar 38, fixed to the rod 37, forces downward the arm 60 of the lever 60—61, and the rack-lifter 65 is pushed upward by the arm 61 of this lever, the carriage-rack 20 and the bar 69 both being raised by the rack-lifter, so that the rack is disengaged from the pinion 23 and the roller 73 is brought into alinement with the pivoted arms 77 on the bar 75. The carriage is then drawn to the left by the action on it of the spring-drum 83, and the roller 73 soon acts on one of the pivoted arms 77. The lower end of this arm is forced upward by the roller against the pressure of the spring 80, as is indicated in Fig. 4, the roller being moved into the space normally occupied by the arm, and the carriage is momentarily retarded by the resistance of this spring and by the impact of the roller against the arm. The carriage will be so retarded whenever one of the arms 77 is raised by the roller 73, until the stop 47 meets the lug 46 of one of the tabulator-stops. When the carriage is arrested, it being then not more than ten or twelve letter spaces distant from where it was last subjected to the retarding action of the roller 73 and one of the pivoted arms 77, the momentum is not great enough, if the pressure of the springs 80 is properly regulated, to render the noise excessive or to expose the machine to injury.

The tabulator-key and stop-bar are restored to their normal positions by the springs 57 and 42, and as the collar 38 on the rod 37 rises, the lever 60—61 and the rack-lifter 65 return to their normal positions, the rack-lifter being both pushed downward by the carriage-rack 20 and being drawn downward by gravity. The carriage rack then re-engages with the escapement-pinion 23 and the bar 69 descends to its normal position, carrying the roller 73 below the lower ends of the pivoted arms 77.

It is to be understood that the invention claimed herein may be embodied in mechanism differing in details of construction or arrangement of parts from that which has been described above. Moreover, the invention may be applied to machines containing denominational or decimal tabulating mechanism, instead of the particular tabulating mechanism shown herein, or other forms of column-spacing mechanism, or to machines in which it is desirable for any reason to retard the motion of the carriage.

The several carriage obstructing or retarding devices 77 or their equivalents, are ar-

ranged in a straight line longitudinally of the carriage and at a plurality of letter space distances apart, and this number of spaces may be varied according to the number of devices used and to the whole travel of the carriage. While I have shown five such independent obstructing devices, it will be understood that the number may be changed to suit the conditions under which they are used, more particularly the extent of travel of the carriage.

In operation, it will be understood that the speed of the released carriage will be partially checked or obstructed momentarily as the devices 73, 77 intermittently and successively coöperate, these devices thus co-acting at predetermined intervals to partially absorb the momentum and striking force of the carriage, and to such an extent that when the carriage arrives at the end of its destination and is arrested, it will have been deprived of enough of its striking force to prevent the usual slamming action and noise, and also to obviate any liability of breakage of or injury to the machine.

It will further be understood that the spring pressed retarding devices 77 are considerably weaker in resistance than the momentum or propelling power of the carriage, and hence do not serve to wholly arrest the motion of the carriage during its travel from right to left, but on the contrary they only act at intervals as yielding barriers interposed to prevent the carriage from acquiring excessive velocity and striking force.

My invention generically considered is shown carried out in another form in a companion application, No. 298,737, filed January 31st, 1906, and in that application I have made my generic and broadest claims.

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

1. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including feed dogs, a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means comprising two devices arranged to co-act while the feed dogs are at rest, one of said devices being included in a series, and the other being coöperative with each device of said series and with only a single device of the series at a time.

2. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including feed dogs, a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and



carriage-retarding means comprising two devices arranged to co-act while the feed dogs are at rest, one of these devices including a spring tending to keep it in its normal position on its support, and one of said devices being included in a series and the other being coöperative with each device of said series.

3. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means comprising two coöperative devices, one of them being adapted to be forced by the carriage into contact with the other, and one of said devices including a spring tending to keep this device in its normal position on its support, and this device being movable from its normal position by the action on it of the other device forcing said spring to yield, one of said devices being included in a series, and the other being coöperative with each device of said series.

4. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means comprising a movable device including a spring tending to keep the device in its normal position, and a coöperative device adapted to be forced by the carriage into contact with the other device and into the space normally occupied by the latter device, one of said devices being included in a series, and the other being coöperative with each device of said series.

5. A typewriting machine provided with carriage-retarding means comprising two coöperative devices, one of them being adapted to be forced by the carriage into contact with the other, and one of said devices including a pivoted arm and a spring tending to keep the arm in its normal position on its support, and said arm being movable from its normal position by the action on it of the first mentioned device forcing said spring to yield, one of said devices being included in a series, and the other being coöperative with each device of said series.

6. A typewriting machine provided with carriage-retarding means comprising a device composed of a pivoted arm and a spring tending to keep the arm in its normal position, and a device adapted to be forced by the carriage against said arm and into the space normally occupied by said arm, one of said devices being included in a series, and the other being coöperative with each device of said series.

7. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a

stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means comprising a series of movable devices, each including a spring tending to keep it in its normal position, and a coöperative device adapted to be forced by the carriage into contact with each device of said series.

8. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means comprising a series of pivoted arms, and springs tending to keep the arms in their normal positions, and a device adapted to be forced by the carriage against each of said pivoted arms.

9. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including feed dogs, a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means comprising a series of movable devices secured on a common support attached to the frame of the machine, and a coöperative device secured on the carriage and adapted to be forced thereby against each device of said series.

10. A typewriting machine provided with carriage-retarding means comprising a series of pivoted arms, and springs tending to keep the arms in their normal positions, said arms being secured on a common support, and a coöperative device secured on the carriage and adapted to be forced thereby against each of said pivoted arms.

11. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including feed dogs, a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means comprising two devices arranged to co-act while the feed dogs are at rest, one of these devices being mounted on the carriage and being movable from its normal position thereon to adapt it to co-act with the other device, and being adapted to be forced by the carriage into coöperative contact with the other device when the carriage is released from the letter-spacing mechanism.

12. In a typewriting machine, the combination of a power-driven carriage, letter-spacing mechanism including a feed rack, a



tabulator-stop, a stop cooperative with said tabulator-stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means comprising two cooperative devices, one of them being pivotally mounted on the carriage and being movable on its pivotal axis to adapt it to co-act with the other device, and being movable with the carriage and into operative contact with the other device when the carriage is released from the letter-spacing mechanism.

13. In a typewriting machine, the combination of a power-driven carriage, letter-spacing mechanism including a feed-rack, a tabulator-stop, a stop cooperative with said tabulator-stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means comprising two cooperative devices, one of them being mounted on the carriage and being movable from its normal position thereon to adapt it to co-act with the other device, and being movable with the carriage and into operative contact with the other device when the carriage is released from the letter-spacing mechanism, a part of the means for releasing the carriage from the control of the letter-spacing mechanism being operative on said device which is mounted on the carriage to move that device from its normal position.

14. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop cooperative with said tabulator-stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the escapement, and carriage retarding means comprising two cooperative devices, one of them being mounted on a bar which is pivotally secured to the carriage, and being movable with the carriage and into operative contact with the other device when the carriage is released from the escapement-mechanism, a part of the means for releasing the carriage from the control of the escapement being operative on said bar to move it on its pivotal axis.

15. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including feed dogs, a tabulator-stop, a stop cooperative with said tabulator-stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means comprising two devices arranged to co-act while the feed dogs are at rest, one of these devices being included in a series of devices arranged in a straight row and the other being cooperative with each device of the series.

16. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including feed dogs, a tabulator-stop, a stop cooperative with said tabulator stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the letter spacing mechanism, and carriage-retarding means comprising two devices arranged to co-act while the feed dogs are at rest, one of these devices being included in a series of devices arranged in a straight row on a supporting bar, and the other being mounted on a parallel supporting bar and being cooperative with each device of said series.

17. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including feed dogs, a tabulator-stop, a stop cooperative with said tabulator-stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage retarding means comprising two devices arranged to co-act while the feed dogs are at rest, one of these devices being included in a series of devices arranged in a straight row on a fixed supporting bar and the other being cooperative with each device of said series.

18. In a typewriting machine, the combination with a power-driven carriage, of letter spacing mechanism including feed dogs, a tabulator-stop, a stop cooperative with said tabulator-stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means comprising two devices arranged to co-act while the feed dogs are at rest, one of these devices including a spring and being a member of a series of devices arranged in a straight row and the other being cooperative with each device of said series.

19. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop cooperative with said tabulator stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means comprising two cooperative devices, one of them including a pivoted arm and a spring and being a member of a series of devices arranged in a straight row, and the other being cooperative with each device of said series.

20. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop cooperative with said tabulator-stop, means including a key for arranging said stops in cooperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means



comprising two coöperative devices, one of them including a spring and being a member of a series of devices arranged in a straight row on a fixed supporting bar, and  
5 the other being coöperative with each device of said series.

21. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop coöperative with said tabulator-stop,  
10 means including a key for arranging said stops in coöperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means comprising two coöperative devices, one of  
15 them including a spring and being a member of a series of devices arranged in a straight row on a fixed supporting bar, and the other being mounted on the carriage and being movable into contact with each  
20 device of said series.

22. In a typewriting machine, the combination with the carriage, of a tabulator-stop, a stop coöperative with said tabulator-stop, means including a key for arranging said  
25 stops in coöperative alinement and for releasing the carriage from the control of the escapement, and carriage-retarding means comprising two coöperative devices, one of them including a pivoted arm and a spring  
30 and being a member of a series of devices arranged in a straight row on a fixed supporting bar, and the other being mounted on the carriage and being movable into contact with each device of said series.

35 23. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar and feed dogs, means including a key for releasing the carriage from the control of the  
40 letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, said means including a series of retarding devices, and being operative at intervals, and adapted  
45 to act on the carriage a plurality of times during a single run thereof.

24. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar  
50 and feed dogs, means including a key for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, said  
55 means including a series of obstructing devices, the relation of these devices to the run of the carriage being such that the carriage is movable a plurality of letter space distances between the successive retarding  
60 actions of said obstructing devices.

25. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar and feed dogs, the teeth of the rack bar being  
65 at letter space distances apart, means

including a key for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, said means including  
70 a series of obstructing devices arranged further apart than are the teeth of the rack bar, and a device adapted to coöperate intermittently and successively with said obstructing devices during a single run of the  
75 carriage.

26. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar and feed dogs, means including a key for releasing the carriage from the control of the  
80 letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, said means including a series of obstructing devices arranged at intervals on a line parallel to the direction in which the carriage travels, and a coöperating actuating device, one of the elements of said carriage-retarding means being arranged to travel with the carriage.  
85 90

27. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar and feed dogs, means including a key for releasing the carriage from the control of the  
95 letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, said means comprising two coöperating devices, one of said devices being included in a series  
100 and the other being coöperative with each device of said series in regular order and with only a single device of the series at a time.

28. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar and feed dogs, means including a key for releasing the carriage from the control of the  
105 letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, one part of the carriage-retarding means being mounted on the frame-work and another part on a bar or support attached to the carriage and movable thereon to bring the parts  
110 of the retarding mechanism into coöperative relations, said bar or support being of substantially the length of the carriage and movable as aforesaid whatever may be the position of the carriage.  
115 120

29. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar and feed dogs, means including a key for releasing the carriage from the control of the  
125 letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, one part of the carriage-retarding means being arranged on the frame-work of the machine,  
130



and another part on a movable bar or support extending lengthwise of the carriage, said bar being movable by said key in whatever position the carriage may be held by the letter-spacing mechanism.

30. In a typewriting machine, the combination with a power-driven carriage, of letter-spacing mechanism including a rack bar and feed dogs, means including a key for releasing the carriage from the control of the letter-spacing mechanism, and carriage-retarding means operative while the carriage is released and the feed dogs are at rest, said means including carriage-obstructing devices

periodically operative during a single run of the carriage and parts of said means being normally out of coöperative relation, and means independent of the letter-spacing mechanism for changing the relation of these parts when the carriage is released.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 31st day of January A. D. 1906.

JACOB FELBEL

Witnesses:

E. M. WELLS,

M. F. HAUNWEBER.