J. FELBEL.

TYPE WRITING MACHINE.

APPLICATION FILED JAN. 31, 1906.

898,635.

Patented Sept. 15, 1908.

4 SHEETS—SHEET 1.

FIG. 1.

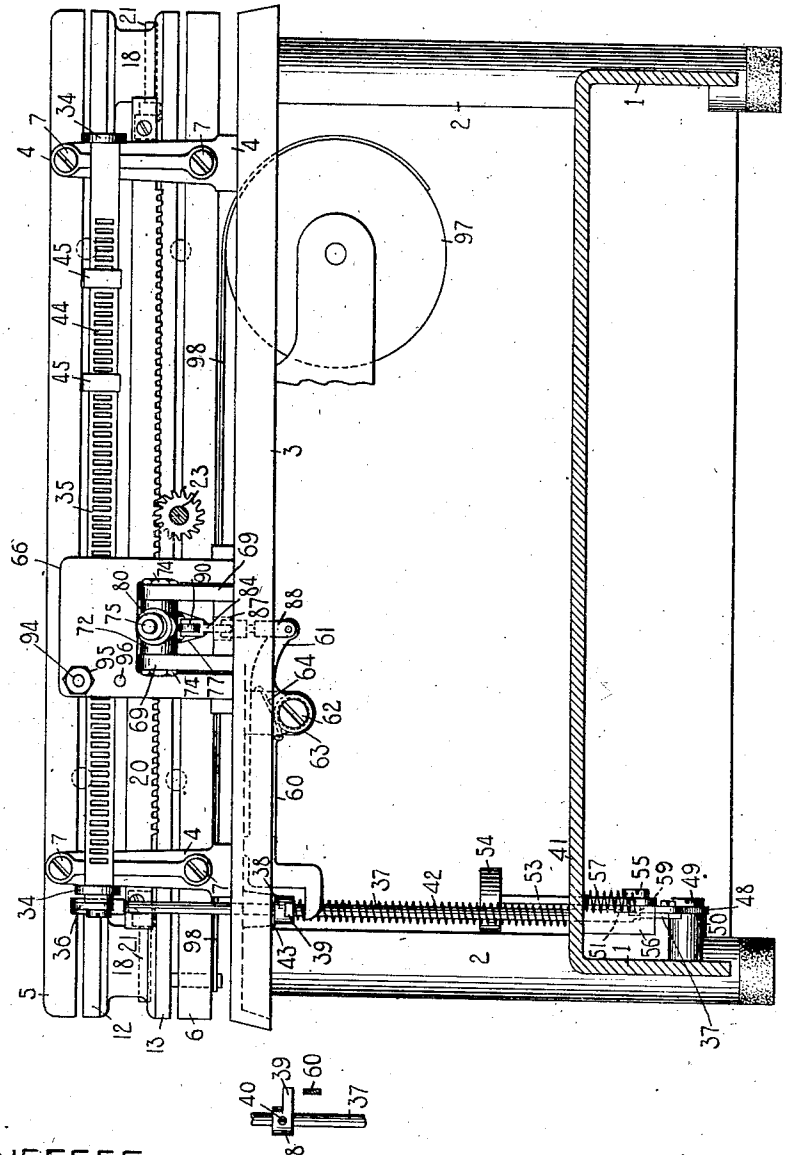
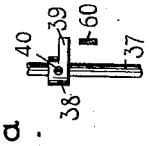


FIG. 1a.



WITNESSES:

E. M. Wells

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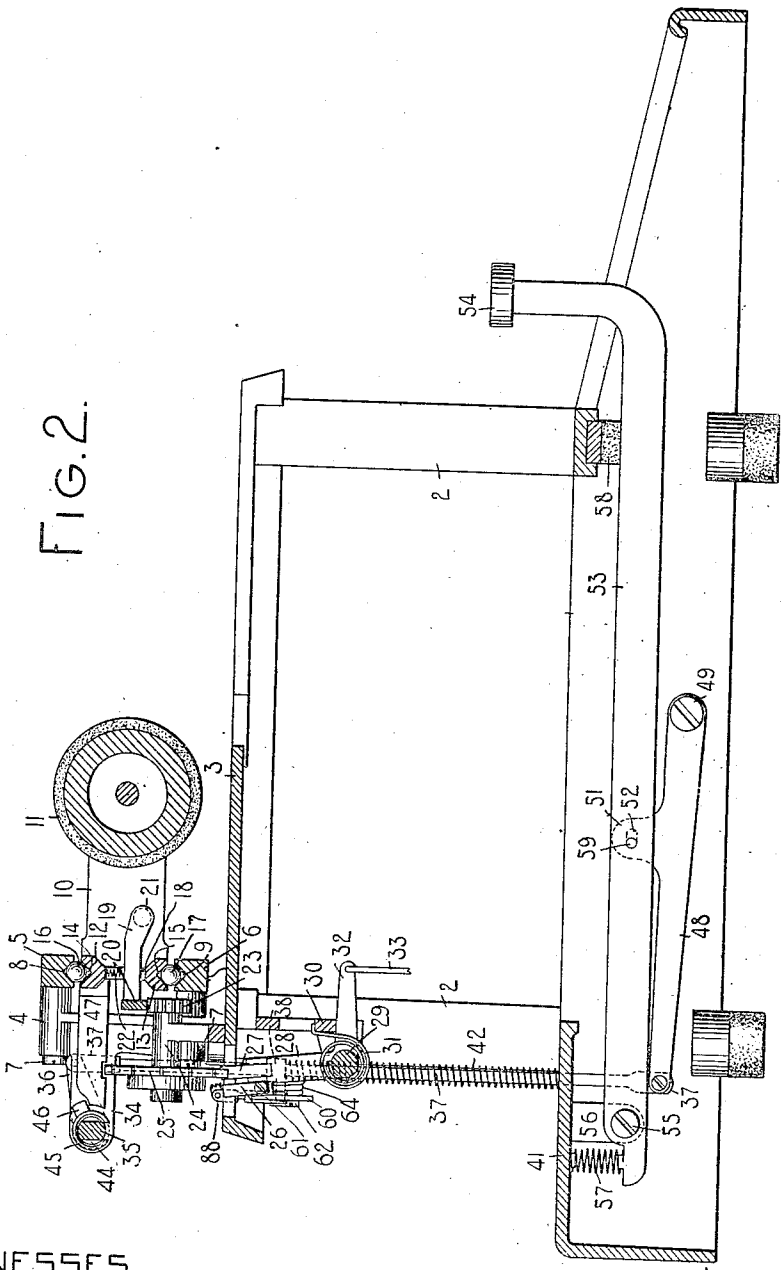
4 SHEETS—SHEET 2.

FIG. 2.



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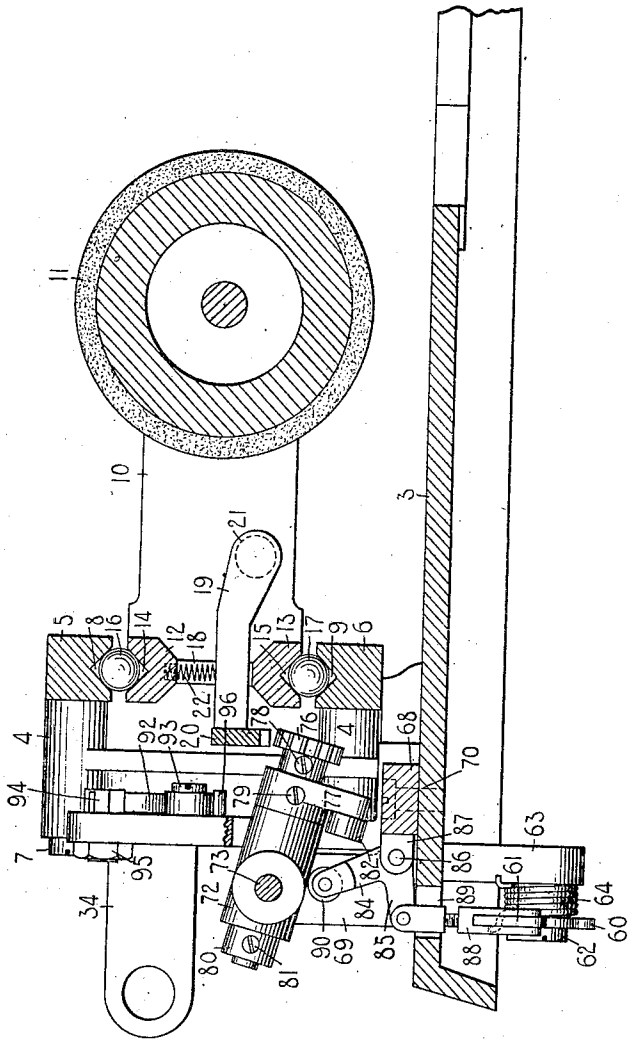
4 SHEETS—SHEET 3.

FIG. 3.



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4 SHEETS—SHEET 4.

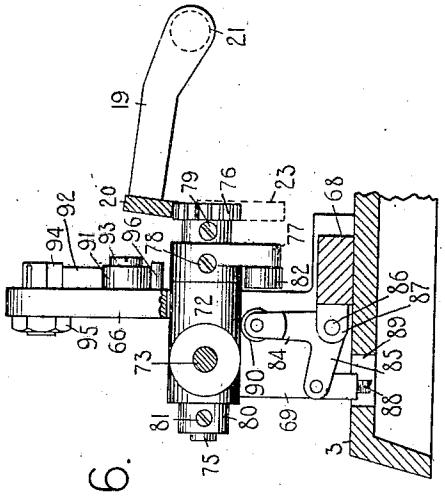

FIG. 6.

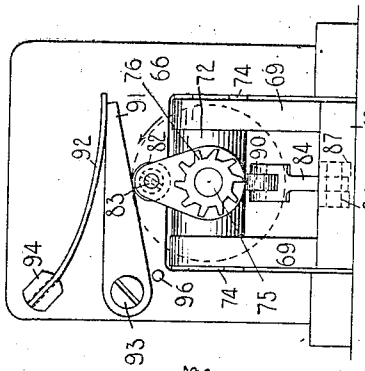

FIG. 5.

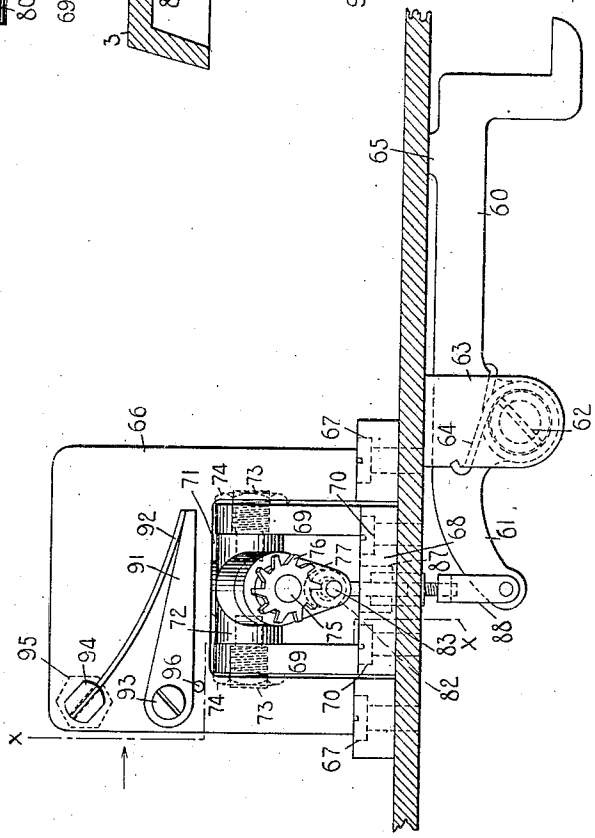

FIG. 4.

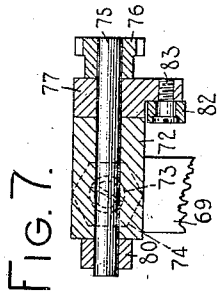

FIG. 7.

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. 898,635. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed January 31, 1906. Serial No. 298,737.

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 carriage retarding devices for 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 the different views, Figure 1 is a rear and sectional elevation of the frame and parts of the mechanism of a Monarch typewriting machine, to which carriage-retarding mechanism embodying the invention is shown applied; Fig. 1ª, a fragmentary side view of parts shown in Fig. 1; Fig. 2, a vertical section, at right angles to the plane of Fig. 1, of said frame and parts of the mechanism of the machine; Fig. 3, an enlarged vertical section of the upper rear part of the machine, the section being at right angles to the axis of the platen; Fig. 4, a front elevation of the carriage-retarding mechanism and of a lever operative to engage one of the parts thereof with the carriage, and a vertical section of a fragment of the top-plate; Fig. 5, a front elevation of the mechanism shown above the top-plate in Fig. 4, the positions of the parts being different from those shown in Fig. 4; Fig. 6, a side and sectional elevation of parts shown in Figs. 3 and 4, the section being on the planes *x*—*x*, Fig. 4, and the positions of the parts being different from those shown in any other figure; and Fig. 7, a section of parts shown in Figs. 1 and 3, *et seq.* to 6 inclusive.

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

The carriage-retarding mechanism in which the invention is embodied is attached to the top-plate of the machine near its rear edge and on the right, preferably, of a vertical plane containing the axis of the escapement pinion. The frame of the machine is composed of the base 1 and four posts 2, only three of which are shown, and the top plate 3. 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 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 or roller channels in which are shown anti-friction balls 16 and 17. The carriage is thus supported by 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. 3, 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, arranged to co-act with 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 of the machine. Whenever the universal bar is actuated by depressing a character key or 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 reëngages with the escapement-wheel and the carriage advances a letter-space distance. But if desired a "reverse feed" escapement may be used instead of the foregoing.

To the standards 4 are rigidly attached rearwardly extending arms 34, in which a stop-bar 35 is journaled at its ends. On the right end of this stop bar, 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 at its front end a rod or link 37, which extends downward from the crank arm 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 part 41 of the base, is a coiled 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 hub 43 formed on the top plate. The collar 38 is so attached to the rod 37 that the projection 39 of the collar extends backward 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 secured to the stop-bar, 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 35, its rear end being out of alinement with the lugs 46 of the tabulator-stops when the stop-bar is in its normal position, 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 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 key lever 53, having on it a tabulator key 54, is pivoted at its rear end by a screw 55 to a lug 56 formed on the under side of the roof 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 the 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 when the key 54 is depressed, the lever 48 is depressed, and the link 37 rocks the bar 44, 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, and on the screw 62 is a coiled spring 64 which bears at one of its ends against the lug 63 and at its other end against the lower edge of the arm 60 of the lever, this arm of the lever extending behind the rod 37 and under the projection 39 of the collar 38, and having on its upper edge a stop 65 which makes contact with the under side of the top plate when the lever is in its normal position, where the spring 64 tends to keep it. A lever substantially the same as this has been used in the Monarch machine to actuate a rack-lifting device, operative to raise the carriage-rack out of engagement with the escapement-pinion, and thus to release the carriage from the control of the escapement. Since, however, a part of the carriage-retarding mechanism herein shown is operative through the lever 60, 61 to lift the carriage rack from the pinion 23, the lifting device heretofore employed is unnecessary in a machine provided with the carriage-retarding mechanism.

The retarding-mechanism comprises two coöperative devices, which are preferably constructed and arranged as they are shown herein, although it is apparent that for either of these particular devices a modification thereof might be substituted. One of them is arranged to be actuated by the carriage and is movable thereby into contact with the other. These devices are mounted on supports which are fixed on the top-plate 3 behind the carriage rack, one of the supports being a standard 66 fastened to the top-plate by screws 67 passing through its base into the top-plate, and the other being a frame having a base 68 and two upright posts 69, the base being fastened to the top-plate by screws 70. The standard 66 has in it an opening 71, and between the posts 69 is pivoted a bearing-block 72, whose pivotal axis is parallel to that of the platen of the machine, this block being mounted on pins 73 which extend through the posts 69 into the block. Those portions of the pins 73 which are within the block are smooth, and the other portions thereof, or those which are in the posts 69, are screw-threaded and engage with screw-threads cut in the posts, the pins having on their outer ends lock nuts 74. The bearing-block 72 extends through the opening 71 in the standard 66 and forms a bearing for a shaft 75, on which are a pinion 76 and an arm 77 fastened to the shaft by screws 78 and 79, the arm 77 fitting close to the front face of the block 72′, and the shaft extending through the block and having on it a collar 80 which fits close to the rear face of the block and which is secured to the shaft by a screw

81. A roller 82 is mounted on the arm 77 by means of a shouldered screw 83 extending into the arm. Under the block 72 is an angular lever, having arms 84 and 85, this lever being pivoted by a pin 86 between lugs 87 on the base 68 of the posts 69. The arm 85 of this angular lever is connected by an adjustable link 88 with the arm 61 of the lever 60, 61, this link extending through a hole 89 in the top plate. On the arm 84 of this angular lever is a roller 90 on which the block 72 rests. When the parts are in their normal positions, shown in Fig. 3, the pinion 76 is beneath and out of contact with the carriage feed-rack 20. The block 72 is movable by the angular lever to the position in which it is shown in Fig. 6, the pinion 76 engaging the rack 20 and raising it out of engagement with the feed pinion 23, thus releasing the carriage from the escapement mechanism. When the block is in that position the arm 84 of the angular lever is upright, the axis of the roller 90 being directly over that of the pin 86.

On the front face of the standard 66 are a pivoted arm 91 and a spring 92, the arm being pivoted to the standard by a screw 93, and the spring being secured in a slot in a screw 94 which passes through the standard and on which is a lock-nut 95 bearing against the back of the standard. The spring 92 bears on the top of the pivoted arm 91 and tends to keep this arm in contact with a stop-pin 96 fixed in the standard, as appears by Fig. 4 in which the arm 91 is shown in its normal position. The pressure of the spring 92 on the arm 91 may be regulated by turning the screw 94 and locking it by means of the lock-nut 95. The arms 77 and 91 are so arranged that when the block 72 is in the position shown in Fig. 6 and the shaft 75 is rotated, the roller 82 of the arm 77 will be moved into contact with the lower face of the arm 91, and that the arm 77 must force the arm 91 upward out of the path of the roller 82, against the pressure of the spring 92 to enable the shaft 75 to make a complete rotation, the roller being moved into the space normally occupied by the arm 91. The action of the arm 77 in forcing the arm 91 upward, as just described, is illustrated in Fig. 5 of the drawings, the dotted circle indicating the orbit in which the end of the arm 77 travels. Whenever the block 72 is restored to its normal position, the action of gravity on the arm 77 causes this arm to assume the position in which it appears in Fig. 3, so that the arm 77 normally extends from the shaft 75 on the opposite side thereof from the arm 91.

The teeth of the pinion 76, which preferably has ten teeth or about that number, are properly formed to engage with the teeth of the carriage-rack 20, and when this pinion is in its normal position, or that shown in Fig. 3, it is under and entirely below the carriage rack, so that the rack may move in either direction with the carriage without touching the pinion 76. When the pinion 76 is raised from its normal position to that in which it is shown in Fig. 6, it engages with the carriage-rack 20 and raises the rack out of engagement with the escapement-pinion 23, so that motion may then be communicated by the carriage to the shaft 75 through the rack 20 and pinion 76.

The machine contains a spring-drum 97 which is connected by a strap 98 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, the lugs 46 on the tabulator-stops 45 being moved downward into alinement with the stop 47 on the carriage. 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 angular lever 84—85 is actuated, the block 72 being moved on its pivotal axis to the position in which it is shown in Fig. 6. The carriage is then drawn rapidly toward the left by the action on it of the spring-drum 97, and as the pinion 76 is turned by the carriage-rack the arm 77 is rotated and acts once during each rotation on the arm 91 as above described.

The upright arm 84 of the angular lever so supports the block 72 that little or no shock is transmitted to the finger of the operator on the depressed tabulator-key when the arms 77 and 91 coact with each other. Since the arm 77 extends from the shaft 75 on the opposite side thereof from the co-acting arm 91, when the pinion 76 is raised into engagement with the carriage-rack, the carriage then moves for several letter-space distances before the retarding devices co-act to check its motion. The carriage therefore starts quickly, and while the arm 77 travels towards the arm 91, the motion of the carriage increases. When the arm 77 acts on the arm 91, the carriage is momentarily retarded by the resistance of the spring 92, a movement of the carriage for about three letter-space distances being required while the arm 77, or the roller 82 thereon, is in contact with the other arm. The carriage will be so retarded whenever the arm 91 is raised by the arm 77, until the stop 47 meets the lug 46 of one of the tabulator stops. When the carriage is arrested, it being then less than ten letter spaces distant from where it was last subjected to the retarding action of the devices 77 and 91—92, its momentum is not great enough, if the pressure of the spring 92 is properly regulated, to render the noise excessive or to expose the machine to injury.

The position of the escapement pinion 23 with relation to the carriage-rack 20, when the rack is operatively engaged with the pinion 76, is indicated by dotted lines in Fig. 6. 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 spring 64 restores the lever 60—61 and the angular lever 84—85 to their normal positions, the carriage-rack descends on the escapement-pinion, forcing the pinion 76 downward, and the block 72 gravitates to the position shown in Fig. 3, carrying the pinion 76 entirely below the carriage-rack.

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 specifically described above, and that it may be applied to machines containing denominational or decimal tabulating mechamism, instead of the particular tabulating mechanism shown herein, or other forms of column-spacing mechanism.

I do not intend to restrict the invention to mechanism composed of a rotary device like the arm 77 and a single coöperative device including a spring, it being evident that a plurality of spring-pressed arms 91, or similar devices, may be arranged to coöperate successively with the arm 77, and it being my purpose to also utilize the invention, if desired, as set forth in a companion application filed by me.

It will be seen from the foregoing that I have provided means for interrupting the motion of the carriage a plurality of times during a single run, or during the travel of the carriage from right to left when released from the control of the escapement mechanism. These successive interruptions operate to break up or diminish the speed and striking force of the carriage and to such an extent that even when the carriage is released to run for its maximum travel, it will finally be arrested by the tabulator stops or margin stops without undue noise or shock, and with no liability of breaking or injuring any of the parts of the machine. It will be understood, of course, that the said interruptions of the motion of the carriage do not effect a complete stoppage of the carraige at any one of the plurality of interrupting points, but on the other hand, that these interruptions are caused intermittently by the interposition of obstructing devices relatively weaker than the momentum of the carriage, and which operate momentarily or periodically to slacken the pace of the carriage and absorb some of the striking force which the carriage would otherwise have if left to continue uninterruptedly to the end of its travel.

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

1. In a typewriting machine, the combination with a carriage, of means for intermittently and partially checking the speed of the carriage during a single run thereof.

2. In a typewriting machine, the combination with the carriage, of retarding means adapted to act intermittently during a single run of the carriage, the relation of said means to the carriage being such that the carriage is movable a plurality of letter-space distances between two successive retarding actions of said means.

3. In a typewriting machine, the combination with the carriage, of retarding means adapted to act intermittently during a single run of the carriage, said mechanism comprising coöperative devices, and one of said devices being movable continuously by the carriage during its run, and the carriage being movable a plurality of letter-space distances between two successive retarding actions of said means.

4. In a typewriting machine, the combination with the carriage, of retarding means adapted to act intermittently during a single run of the carriage, said means comprising a device movable by the carriage while traveling a plurality of letter-space distances and while a portion of said means is inactive.

5. In a typewriting machine, the combination with the carriage, of retarding means adapted to act intermittently during a single run of the carriage, said means comprising coöperative devices, and one of said devices being movable continuously by the carriage during its run, and a portion of said means being inactive at times while the carriage travels a plurality of letter-space distances.

6. In a typewriting machine, the combination with the carriage, of retarding means adapted to act intermittently during a single run of the carriage, said means comprising a portion mounted on a fixed support, and a coöperative device arranged to be moved by the carriage while said portion on the fixed support is at rest.

7. In a typewriting machine, the combination with the carriage, of retarding means adapted to act intermittently during a single run of the carriage, said means comprising a portion mounted on a fixed support and a coöperative device arranged to be moved by the carriage into and out of contact with said portion on the fixed support.

8. In a typewriting machine, the combination of a tabulating stop, a stop coöperative with said tabulating 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 arranged to be actuated by the carriage and being movable thereby into contact with the other, and one of said devices including a spring tending to keep this device in a normal position on its

support, and this device being movable from that normal position by the action on it of the other device forcing said spring to yield.

9. In a typewriting machine, the combination of a tabulating stop, a stop coöperative with said tabulating 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 arranged to be actuated by the carriage and being movable thereby 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, and said arm being movable from its normal position by the action on it of the first mentioned device forcing said spring to yield.

10. In a typewriting machine, the combination of a tabulating-stop, a stop coöperative with said tabulating 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 arranged to be actuated by the carriage and being movable thereby into contact with the other device and into the space normally occupied by the latter device.

11. In a typewriting machine, the combination of an adjustable tabulating stop, a stop coöperative with said adjustable stop, means including a key for arranging said stops in coöperative alinement, and carriage-retarding means comprising a movable device including a spring tending to keep the device in its normal position, and an arm and a pinion both fast on a shaft, said pinion being normally underneath and disengaged from the carriage-rack, a pivoted bearing-block in which said shaft is mounted, and means arranged to be actuated by said key and operative on said bearing-block to raise said pinion into engagement with the carriage-rack and to lift the rack from the escapement-pinion, the arm on said shaft being movable by the shaft, when the carriage is disengaged from the escapement, into contact with the aforesaid movable device.

12. A typewriting machine provided with carriage-retarding means comprising two coöperative devices, one of them being arranged to be actuated by the carriage and being movable thereby 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, and said arm being movable from its normal position by the action on it of the first mentioned device forcing said spring to yield.

13. A typewriting machine provided with carriage-retarding means comprising a pivoted arm, and a spring tending to keep the arm in its normal position, a device arranged to be actuated by the carriage and being movable thereby against said arm and into the space normally occupied by said arm, and means for imparting motion from the carriage to said device.

14. A typewriting machine provided with carriage-retarding means comprising a movable device including a spring tending to keep the device in its normal position, and a coöperative device mounted on an axis and arranged to be rotated by the carriage and being movable thereby into contact with the other device and into the space normally occupied by the latter device.

15. A typewriting machine provided with carriage-retarding means comprising a movable device including a spring tending to keep the device in its normal position, and an arm and a pinion both fast on a shaft, said pinion being normally underneath the carriage-rack, and said shaft being movable on an axis to engage the pinion with and disengage it from the carriage-rack, and said arm being movable by said shaft when the pinion is operatively engaged with the carriage-rack, into contact with the first mentioned device and into the space normally occupied by that device.

16. A typewriting machine provided with carriage-retarding means comprising a movable device including a spring tending to keep the device in its normal position, an arm and a pinion both fast on a shaft, said pinion being normally underneath the carriage rack, and a pivoted block forming a bearing for said shaft and movable on its pivotal axis to engage the pinion with and disengage it from the carriage-rack, said arm being movable by said shaft, when the pinion is operatively engaged with the carriage-rack, into contact with the first mentioned device and into the space normally occupied by that device.

17. A typewriting machine provided with carriage-retarding means comprising a pivoted arm and a spring, the spring tending to keep the arm in its normal position, a cooperative device mounted on an axis and arranged to be rotated by the carriage and being movable thereby against said arm and into the space normally occupied by said arm, and means for imparting motion from the carriage to the rotary device.

18. A typewriting machine provided with carriage-retarding means comprising a pivoted arm and a spring, the spring tending to keep the arm in its normal position, and an arm and a pinion both fast on a shaft, said pinion being normally underneath the carriage rack, and said shaft being movable on an axis to engage the pinion with and disengage it from the carriage-rack, and the arm on said shaft being movable by the shaft,

when the pinion is operatively engaged by the carriage-rack, into contact with the first mentioned arm and into the space normally occupied by that arm.

19. A typewriting machine provided with carriage-retarding means comprising a pivoted arm and a spring, the spring tending to keep the arm in its normal position, an arm and a pinion both fast on a shaft, said pinion being normally underneath the carriage-rack, and a pivoted block forming a bearing for said shaft and movable on its pivotal axis to engage the pinion with and to disengage it from the carriage-rack, the arm on said shaft being movable by the shaft, when the pinion is operatively engaged with the carriage-rack, into contact with the first mentioned arm and into the space normally occupied by that arm.

20. A typewriting machine provided with carriage-retarding means comprising a pivoted bearing-block, a shaft mounted in said block and extending from it underneath the carriage-rack, and a pinion on said shaft under the carriage-rack, in combination with an angular lever and means including a key for actuating it, said angular lever being pivoted to a fixed support under said block, and one arm of the angular lever being operative on the block to raise said pinion and the carriage-rack, and said arm being upright under the bearing-block when said pinion is in its uppermost position.

21. A typewriting machine provided with carriage retarding means comprising a bearing-block pivoted on an axis parallel to that of the platen of the machine, the pivotal axis of said block being behind the carriage-rack, a shaft mounted in said block and extending forward from it underneath the carriage-rack, and a pinion on said shaft under the carriage-rack, in combination with an angular lever and means including a key for actuating it, said angular lever being pivoted to a fixed support under said block, the pivotal axis of the angular lever being in front of a vertical plane containing the pivotal axis of the block, and one arm of the angular lever being operative on the block to raise said pinion and the carriage-rack, and said arm being upright under the block when said pinion is in its uppermost position.

22. In a typewriting machine, the combination of a tabulating-stop, a stop coöperative with said tabulating 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 arranged to be actuated by the carriage and being movable thereby in a definite path into contact with the other, and means for connecting with the carriage the device that is arranged to be actuated thereby and for enabling the carriage to travel several letter space distances after the last mentioned of said devices is connected therewith and before it is brought into contact with said other device.

23. A typewriting machine provided with carriage retarding means comprising two coöperative devices, one being a rotary device arranged to be rotated by the carriage and being movable thereby in a true circular path into contact with the other device, and means for connecting the rotary device with the carriage and for enabling the carriage to travel several letter space distances after the rotary device is connected therewith and before it is brought into contact with said other device.

24. A typewriting machine provided with carriage-retarding means comprising two coöperative devices, one of them having a single rotary arm normally extending from its pivotal axis on the opposite side thereof from said other coöperative device, in combination with means for operatively connecting said arm with the carriage.

25. A typewriting machine provided with carriage-retarding means comprising two coöperative devices, one of them having an arm fast on a shaft and normally extending from the shaft on the opposite side thereof from said other coöperative device, in combination with a pinion fast on the shaft under the carriage-rack, and means including a key for raising the pinion into operative engagement with the carriage rack.

26. A typewriting machine provided with carriage-retarding means comprising two coöperative devices, one of them having an arm fast on a shaft and normally extending from the shaft on the opposite side thereof from said other coöperative device, in combination with a pivoted bearing-block in which said shaft is mounted, a pinion fast on the shaft under the carriage rack, and means including a key for turning the bearing block on its pivotal axis and raising the pinion into operative engagement with the carriage-rack.

27. A typewriting machine provided with carriage-retarding means comprising two coöperative devices normally out of engagement with each other, one of them being a rigid arm fast on a shaft, in combination with a pinion fast on the shaft under the carriage-rack, and means including a key for raising the pinion into operative engagement with the carriage rack.

28. A typewriting machine provided with carriage-retarding means comprising two coöperative devices normally out of engagement with each other, one of them being a rigid arm fast on a shaft, in combination with a pivoted bearing-block in which said shaft

is mounted, a pinion fast on the shaft under the carriage-rack, and means including a key for turning the bearing-block on its pivotal axis and raising the pinion into operative engagement with the carriage-rack.

29. A typewriting machine provided with carriage-retarding means comprising two coöperative devices, one of them being a rigid arm fast on a shaft and having on it a roller, in combination with a pinion fast on the shaft under the carriage-rack, and means including a key for raising the pinion into operative engagement with the carriage-rack.

30. A typewriting machine provided with carriage-retarding means comprising two coöperative devices, one of them being a rigid arm fast on a shaft and having on it a roller, in combination with a pivoted bearing-block in which said shaft is mounted, a pinion fast on the shaft under the carriage-rack, and means including a key for turning the bearing block on its pivotal axis and raising the pinion into operative engagement with the carriage-rack.

31. In a typewriting machine, the combination with a carriage, of coöperating retarding devices, and automatic means to render the co-action of said devices intermittent during a single run of the carriage.

32. In a typewriting machine, the combination with a carriage, of coöperating retarding devices mounted on the frame of the machine, and automatic means to render the co-action of said devices intermittent during a single run of the carriage.

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

JACOB FELBEL.

Witnesses:
E. M. WELLS,
M. F. HANNWEBER.