March 24, 1925. 1,530,885

B. M. DES JARDINS

TYPEWRITING MACHINE

Filed April 12, 1921

Fig. 2.

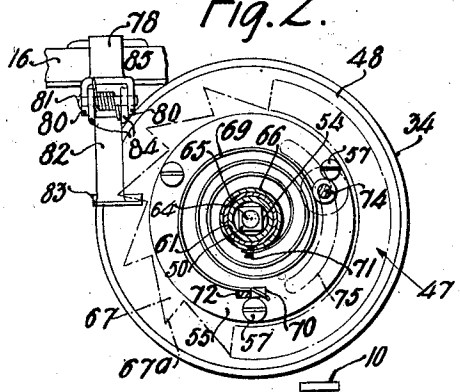


Fig. 1.

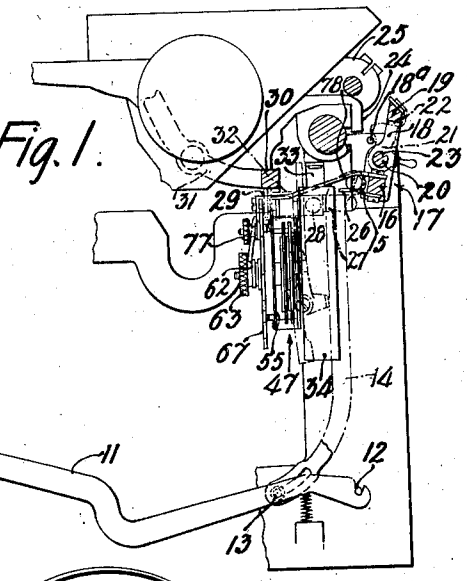


Fig. 3.

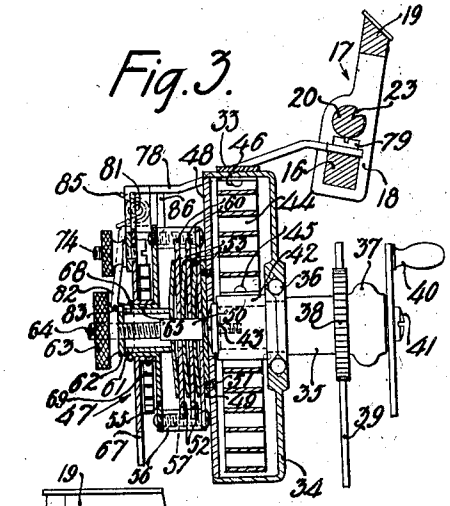


Fig. 5.

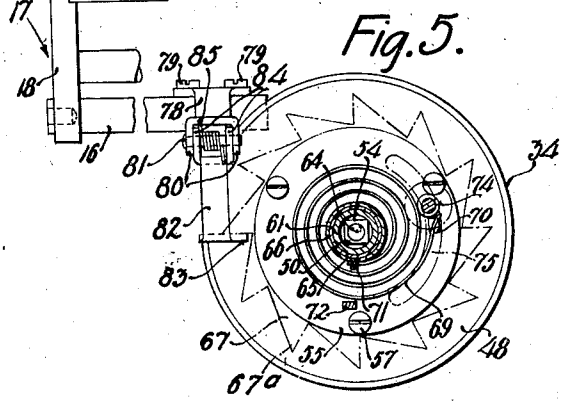
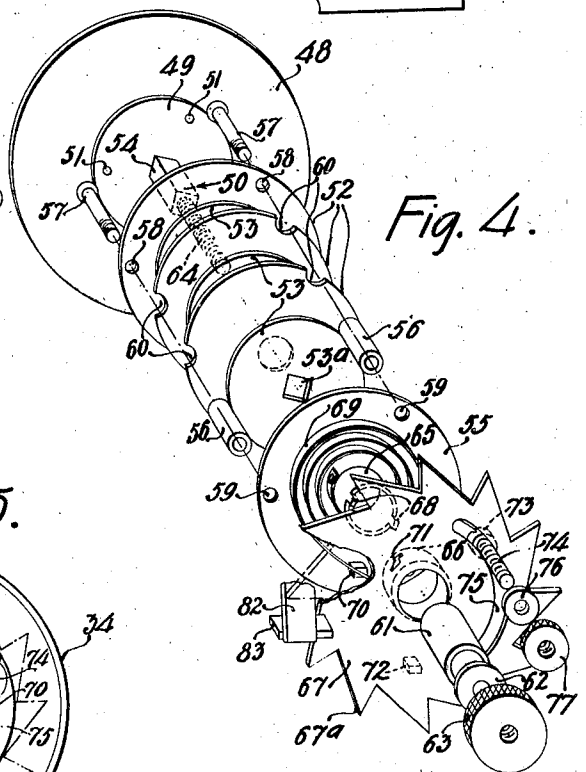


Fig. 4.



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by [illegible]
Attorney

Patented Mar. 24, 1925. 1,530,885

UNITED STATES PATENT OFFICE.

BENJAMIN M. DES JARDINS, OF WEST HARTFORD, CONNECTICUT, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPEWRITING MACHINE.

Application filed April 12, 1921. Serial No. 460,680.

To all whom it may concern:

Be it known that I, BENJAMIN M. DES JARDINS, a citizen of the United States, residing in West Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Typewriting Machines, of which the following is a specification.

This invention relates to means for retarding or regulating the speed of the typewriter carriage when tabulating is being effected, and is herein illustrated as applied to an Underwood standard typewriter.

The main object of the invention is to provide a simple and efficient carriage-retarding or speed-regulating device readily applicable to machines of standard form and adapted to prevent undue shock upon stopping the carriage at the end of a tabulating movement.

A feature of the invention consist in mounting the retarding device on the spring-drum of the carriage-feeding mechanism.

Another feature of the invention consists in providing a retarding device rotatable with the spring-drum and having two relatively rotatable frictional elements, the frictional resistance between said elements determining the extent of the retarding action on the spring-drum.

Another feature consists in the provision of means to regulate the frictional resistance between the frictional elements of the retarding device.

Another feature of the invention consists in the provision of a retarding device by which, when effective, the typewriter carriage is retarded, first by a spring, and then, when the resistance of the spring has been overcome, by a frictional retarding means.

Another feature of the invention consists in the provision of a retarding device, whereby a comparatively light resistance is offered to the carriage for a given distance, and then the carriage is subjected to a greater resistance.

A further feature consists in the provision of means to determine the extent of travel of the typewriter carriage during which the retarding action is effected by the spring.

In carrying out the invention, a pawl is connected with the rocking frame on which the column-stops are set in the tabulating mechanism of the Underwood standard typewriter, and, upon movement of a tabulator-key, the carriage will be released and the pawl or stop will be moved into position to engage a tooth of a ratchet-wheel forming part of a retarding device mounted on the spring-drum of the carriage-feeding mechanism. The rest of the retarding device will turn with the spring-drum until a stop of a member adjacent the ratchet-wheel engages a stop of the ratchet-wheel. During this action, the movement of the spring-drum is resisted by a light spring. From this time, the member referred to will be held against actuation, and, until the tabulating action is completed, the spring-drum will turn relatively to said member against the frictional resistance between an element of which said member is a part and an element connected to the spring-drum to turn therewith. Adjusting means may be provided to determine the extent of movement of said member with reference to the ratchet-wheel, and means may also be provided for regulating the frictional resistance to the turning of the spring-drum.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a fragmentary side view of an Underwood typewriter, showing my invention applied thereto.

Figure 2 is a front view of the retarding device, partly in section, showing the parts in their normal positions.

Figure 3 is an enlarged sectional side view of the parts involved in my invention.

Figure 4 is a perspective view of the parts of the retarding device in separated relation, but showing the relative positioning of the parts.

Figure 5 is a view similar to Figure 2, but showing the position of the parts at the time when the frictional device becomes effective to retard the spring-drum.

Upon depression of a tabulator-key 10, the key-lever 11 will be rocked about its pivot 12, and, by means of a pin 13 thereon engaging in a slot in the lower end of a link 14 pivoted at its upper end to an ear 15 fastened to a shaft 16 of a rocking frame 17, will swing the latter forwardly to effective position.

The frame 17 also includes arms 18 fixed on the shaft 16 and connected at their upper ends by means of a bar 19. A rod 20 also extends from end to end of the frame 17

above the shaft 16, and serves to support one or more column-stops 21, which are slidable therealong. Each column-stop 21, when brought to a suitable position, may be rocked forwardly on the rod 20 to bring teeth 22 thereon into notches in the lower edge of bar 19, the stop, when in forward position, being retained by any suitable means, such as a spring-pressed ball (not shown) mounted in the stop in position to engage the groove 23 in rod 20 when the stop is in effective position.

Upon the forward swinging of frame 17, the forwardly-projecting portion of an effectively positioned column-stop will be brought into the path of a co-operating stop 24 on the typewriting carriage 25, the forward movement of the frame being limited by any suitable means, such as a stop pin 18ª, in the path of one of the arms 18. At the same time, an arm 26 secured by any suitable means to the lower face of the shaft 16, which is square throughout the greater part of its length, will press downwardly on the rearwardly-extending arm of a lever 27, and swing the latter about its pivot 28 to lift a roller 29 journaled on the forward end of the lever 27. Upon this roller 29 rests a rack bar 30 pivotally supported on the carriage 25 by means of arms 31 and normally in mesh with a pinion 32 of the usual Underwood escapement mechanism, comprising an escapement wheel and fast and loose dogs. It will be apparent that the roller 29, in its upward movement, will lift the rack bar 30 out of engagement with pinion 32 and release the carriage, so that the latter will be drawn in a letter-feed direction by means of a strap 33 connected thereto and to the usual spring-drum 34. The mechanism described up to the present point is in general similar to that disclosed in the patent to H. Crutchley, No. 929,080, dated July 27, 1909.

The spring-drum 34 is mounted for rotation on a shaft 35, by means of ball-bearings 36. The shaft 35 is provided with a reduced portion journaled in a bracket 37, and a ratchet-wheel 38 is provided between the enlarged portion of the shaft 35 and the bracket 37 and may be engaged by a pawl or dog 39, pivotally mounted on the bracket 37. A handle 40 is fastened on the outer end of the shaft 35, by means of a screw 41, for a purpose to be described hereinafter. Forward of the ball-bearings 36, a sleeve 42 is mounted on a reduced portion of shaft 35, and is held in position thereon by means of a screw 43, threaded into the end of the shaft. For the purpose of actuating spring-drum 34, provision is made of a spring 44, having its inner end secured to the sleeve 42 by a suitable means, such as a rivet 45, and the spring may be secured to the spring-drum 34, at its periphery, by any suitable means, such as a rivet 46. It will be evident that, by turning the shaft 35 by means of the handle 40, the tension of the spring 44 may be regulated, and that the shaft 35 may be maintained in such adjusted position by means of the dog 39 engaging the ratchet-wheel 38.

According to the present invention, a carriage-retarding or speed-regulating device 47 may be attached to the head 48 of the spring-drum 34. For this purpose, the retarding device 47 comprises a base-plate 49 and a stud 50 projecting therefrom, by which the other parts of the speed-retarding device are supported. The plate 49 may be secured to the head 48 of the spring-drum by any suitable means, such as screws 51, and the stud 50 may be secured to the plate 49 in any suitable manner, such as, for example, by passing a reduced portion of the stud through a corresponding opening in the plate 49 and upsetting the rearwardly-projecting portion, so as to fill a conical depression on the rear face of said plate 49, the upset portion in its finished form being flush with the rear surface of said plate.

Provision may be made of a plurality of flat plates or disks 52, loosely mounted on stud 50, and of dished plates or disks 53 between said plates 52 and having square openings 53ª to fit over a square portion 54 of the stud 50. It will be evident that the plates or disks 53 may be moved along the stud 50, but will be held against rotation thereon. Provision may also be made of a plate 55 of substantially the same size as the rearmost plate 52, and of spacing sleeves 56, placed therebetween, through which are passed screws 57, inserted through openings 58 in the rearmost plate 52, and threaded into openings 59 in the plate 55. As a result of this arrangement, the rearmost plate 52 and the plate 55 will always be held at the same distance apart. The remaining plates are somewhat smaller than the rear plate 52, and are provided with recesses 60 in their edges to receive the spacing sleeves 56, whereby the plates 52 will be held against relative rotation, but may be moved to and from each other. A sleeve 61 may be placed over the stud 50 with its inner end against the outermost plate, and, by means of a washer 62 placed at the outer end of sleeve 61 and a knurled head or nut 63 threaded upon a reduced outer portion 64 of the stud 50, the two sets of plates or disks may be held in effective relation. It will be seen that the retarding device in so far as it has been described consists of two co-operating friction elements, one comprising base-plate 49 and plates 53, and the other comprising disks or plates 52.

The plate 55 at the front of the sets of friction elements has integrally formed upon it a forwardly projecting sleeve 65 fitting over the sleeve 61, and acting as a bear-

ing for a sleeve 66 extending rearwardly from a ratchet-wheel 67, the sleeve 66 and the ratchet-wheel 67 being held in position on sleeve 65 by lugs 68 on the latter bent outwardly to engage the outer surface of the ratchet-wheel. The ratchet-wheel 67 is yieldably connected with the plate 55 by means of a spring 69, fixed at one end in a lug 70 on the plate and at the other end to a hook 71 on the sleeve 66 fixed to the ratchet-wheel 67. Normally, the spring 69 holds the lug 70 on the front face of the plate or disk 55 in engagement with a lug 72 on the rear face of the ratchet-wheel 67, as shown in Figure 2.

In order to limit the relative movement between the ratchet-wheel 67 and the plate 55 in the opposite direction, provision may be made of a suitable stop on the rear face of the ratchet-wheel 67 at such a distance from the center of the ratchet-wheel as to lie in the path of the lug 70. Preferably this stop may consist of the head 73 of a screw 74 projecting through an arcuate slot 75 in the ratchet-wheel 67, the slot 75 being concentric with the center of the ratchet-wheel and at a suitable distance therefrom. In order to secure the screw 74 at any desired point in the slot 75, provision may be made of a washer 76 carried by said screw at the front of the ratchet-wheel and a knurled head or nut 77 threaded on the screw.

To render the retarding device 47 effective when the tabulating mechanism is operated, provision may be made of an arm 78 secured to the shaft 16 by any suitable means, such as a screw 79, and having its forward end overlying the ratchet-wheel at one side thereof, as shown in Figures 2 and 5. At its forward end the arm 78 is provided with downwardly-extending lugs 80 on opposite sides thereof, and, upon a pivot 81, supported by said lugs, is pivoted a pawl 82 having a tooth 83 lying adjacent the teeth of the ratchet-wheel 67 and slightly at the front thereof. At a point adjacent the lugs 80, the pawl 82 is bent rearwardly substantially at a right angle, and is provided with upwardly-extending lugs 84 through which pivot 81 passes. The pawl 82 is yieldably urged toward the ratchet-wheel by means of a spring 85 coiled about the pivot 81 and having engagement with the arm 78 and the pawl 82, respectively, the rearward movement of the pawl 82 with reference to the arm 78 being limited by a lug 86 extending upwardly from the substantially horizontal portion of the pawl 82, and normally engaging the arm 78, as shown in Figure 3.

Upon operation of the tabulating mechanism by means of the tabulator-key 10, the arm 78 will be swung downwardly and the pawl 82 will be moved rearwardly to engage with the teeth 67^a of the ratchet-wheel 67. At the same time, the carriage 25 will be released from the escapement mechanism, and the spring-drum 34 will begin to rotate to move the carriage in a letter-feed direction. If the tooth 83 of the pawl 82 is properly positioned with reference to the teeth 67^a of the ratchet-wheel, it will immediately engage the lower edge of one of the teeth, as indicated in Figure 5, and the ratchet-wheel 67 will be held against movement. If, however, the tooth 83 in its rearward movement engages the side of a tooth 67^a of the ratchet-wheel, the spring 85 will yield, and, upon a movement of the ratchet-wheel in counter-clockwise direction, as shown in Figures 2 and 5, the tooth 83, which is shown in obstructed position in Figure 2, will engage the next tooth 67^a of the ratchet-wheel as the latter is turned with the spring-drum 34.

Upon the establishment of an effective engagement between the tooth 83 of the pawl 82 and a tooth of the ratchet-wheel 67, the ratchet-wheel will be held against movement, and, as the plate 55 is turned with the spring-drum against the tension of the spring 69, the lug 70 on the front face of the plate 55 will be moved from the position indicated in Figure 2 until it engages the screw-head 73, as indicated in Figure 5. The plate 55 will then be held against movement by means of the ratchet-wheel 67, and the friction element, of which plate 55 forms a part, will be held stationary, thereby exerting a braking action on the other friction element, including the base-plate 49 and the plates or disks 53, thereby retarding the spring-drum 34 and regulating the speed of the same.

It will be evident that, at the start of each tabulating movement of the spring-drum, the carriage will be retarded only by the light resistance due to the spring 69, and that, upon engagement of the lug 70 with the screw-head 73, the movement of the carriage and spring-drum will be retarded by the greater resistance exerted between the friction elements of the retarding device. Consequently undue delay in starting the tabulating movement of the carriage will be avoided, and at the same time a sufficient retarding action to prevent too great impact of the stop at the rear of the carriage against the next operatively positioned column-stop will be obtained.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a carriage, means including a spring-drum to urge the carriage in a letter-feeding direction, escapement mechanism

to control the carriage and tabulating mechanism including means to release the carriage from the escapement mechanism, of normally ineffective retarding means fastened to and moving with the spring-drum and rendered effective by said tabulating mechanism, said retarding means comprising spring means offering a slight resistance to the action of the spring-drum and frictional means effective when the resistance of said spring means has been overcome.

2. In a typewriting machine, the combination with a carriage, means including a spring-drum to urge the carriage in a letter-feeding direction, escapement mechanism to control the carriage and tabulating mechanism including means to release the carriage from the escapement mechanism, of normally ineffective retarding means fastened to and moving with the spring-drum and rendered effective by said tabulating mechanism, the resistance of said retarding means being slight during a preliminary movement of the spring-drum, and being much stronger during the rest of the movement of the spring-drum.

3. In a typewriting machine, the combination with a carriage, means including a spring-drum to urge the carriage in a letter-feeding direction, escapement mechanism to control the carriage and tabulating mechanism including means to release the carriage from the escapement mechanism, of normally ineffective retarding means fastened to and moving with the spring-drum and rendered effective by said tabulating mechanism, said retarding means comprising a weak resistance device effective in the preliminary movement of the spring-drum and a strong resisting device thrown into action at the end of such preliminary movement.

4. In a typewriting machine, in combination, a carriage, feeding means therefor including a spring-drum, and retarding means for said spring-drum moving idly therewith and comprising two co-operating friction elements, means for actuating one of said friction elements by the spring-drum, and means normally ineffective to hold the other of said elements against movement but capable of being rendered effective to do so.

5. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device fastened to the drum and normally rotating idly therewith, a tabulating mechanism, and means actuated by the tabulating mechanism for rendering said retarding device effective.

6. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device comprising two co-operating friction elements, one of which is secured to the drum so that the device will normally rotate idly therewith, tabulating mechanism, and means actuable by the tabulating mechanism to check the movement of the second element and thereby render said device effective.

7. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device mounted on said drum, comprising two co-operating friction elements, one of which is secured to the drum so that the device normally rotates idly therewith, a controlling member, a spring connection between said controlling member and the second element, and means to limit the movement between said member and the second element, tabulating mechanism, and means actuable by said tabulating mechanism to check said controlling member, the second element then moving with respect thereto until its limiting position is reached, whereupon the movement of the carriage will be resisted by the friction between said elements.

8. In a typewriting machine, the combination with a carriage, means to urge the carriage in a letter-feeding direction, escapement mechanism to control the carriage, and tabulating mechanism including means to release the carriage from the escapement mechanism, of normally ineffective retarding means for the carriage rendered effective by said tabulating mechanism and independent of the carriage, said retarding means comprising spring means offering slight resistance to the movement of the carriage and frictional means effective when the resistance of said spring means has been overcome.

9. In a typewriting machine, the combination with a carriage, means to urge the carriage in a letter-feeding direction, escapement mechanism to control the movement of the carriage, and tabulating mechanism including means to release the carriage from the escapement mechanism, of normally ineffective retarding means for the carriage rendered effective in its normal position by said tabulating mechanism, said retarding means comprising a weak resisting device effective in a preliminary movement of the carriage and a strong resisting device thrown into action at the end of such preliminary movement.

10. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device connected with said drum, comprising two co-operating friction elements, one of which is connected with the drum so that the device normally rotates idly therewith, a controlling member, a spring connection between said controlling member and the second element, and means to limit the movement betwenn said member and the second

element, tabulating mechanism, and means actuable by said tabulating mechanism to check said controlling member, the second element then moving with respect thereto, until its limiting position with reference to the controlling member is reached, whereupon the movement of the carriage will be resisted by the friction between said elements.

11. In a typewriting machine, in combination, a carriage, means to urge the carriage in a letter-feeding direction, a rotatable retarding device comprising two co-operating friction elements, one of which is connected with the carriage, so that the device will normally rotate idly during the movement of the carriage, tabulating mechanism, and means actuable by the tabulating mechanism to check the movement of the second element, and thereby render said retarding device effective on the carriage.

12. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device comprising two co-operating friction elements, one of which is secured to the drum so that the device will normally rotate idly therewith, a wheel, a spring connecting said wheel with the second element, and means to limit the movement of said wheel with reference to said second element, tabulating mechanism, and means actuable by said tabulating mechanism to check the movement of said wheel, and thereby render said device effective, to restrain the spring-drum first by the resistance of said spring, and later by the resistance due to relative movement between said friction elements.

13. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device comprising two co-operating friction elements, one of which is secured to the drum so that the device will normally rotate idly therewith, and a ratchet-wheel yieldably connected to the second element and having a limiting movement relative thereto, tabulating mechanism including a shaft extending transversely of the machine, an arm mounted on said shaft, and a pawl on the free end of said arm, whereby, upon actuation of said tabulating mechanism, the pawl will be shifted to engage said wheel and render the retarding device effective.

14. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device comprising two co-operating friction elements, one of which is secured to the drum so that the device will normally rotate idly therewith, and a ratchet-wheel yieldably connected to the second element and having a limiting movement relative thereto, tabulating mechanism including a shaft extending transversely of the machine, an arm mounted on said shaft, and a pawl yieldably supported on the free end of said arm, whereby, upon actuation of said tabulating mechanism, the pawl will be moved towards said wheel to engage a tooth thereof, and, in case the pawl strikes the side of the tooth, it will yield and engage the next tooth when the wheel is sufficiently advanced.

15. In a typewriting machine, in combination, a traveling carriage, tabulating means therefor, a retarding device for said carriage comprising two friction elements, one of said elements consisting of a set of plates held against rotation with respect to each other but movable toward and from each other, the second of said elements consisting of a second set of plates alternating between the plates of the first set and held against relative rotation with respect to each other but movable toward and from each other, means to adjust the pressure between said plates, and means rendered effective upon actuation of the tabulating means, whereby movement of the carriage will cause relative movement between said friction elements, whereby the carriage will be correspondingly retarded.

16. In a typewriting machine, in combination, carriage-urging means including a spring-drum, a retarding device comprising two co-operating friction elements, one of which is secured to the drum so that the device will normally rotate idly therewith, a wheel, a spring connecting said wheel with the second element, and means to limit the movement of said wheel with reference to said second element, comprising a stop on the second element, a stop on said wheel normally held by said spring against the stop on said second element, and an adjustable stop on said wheel in the path of the stop on the second element to limit the movement of the wheel with reference to the second element, tabulating mechanism, and means actuable by said tabulating mechanism to check the movement of said wheel, and thereby render said device effective to restrain the spring-drum first by the resistance of the spring, and later by the resistance due to relative movement between said friction elements.

17. In a typewriting machine, in combination, a traveling carriage, tabulating mechanism therefor, a retarding device for said carriage comprising two friction elements, one of said elements consisting of a set of plates held against rotation with reference to each other but movable toward and from each other, the second element consisting of a second set of plates alternating between the plates of the first set and held against relative rotation with respect to each other but movable toward and from each other, the second element also including an outer plate supported at a fixed distance

from the inner plate of the second set, a wheel coaxial with said outer plate, a spring tending to rotate said wheel in one direction with reference to said outer plate, adjustable means to limit the movement of said wheel with reference to said outer plate, and means rendered effective upon actuation of the tabulating mechanism, whereby movement of the carriage will effect relative movement between said wheel and said second friction element until said relative movement is stopped by the limiting means, and then will effect relative movement between said friction elements.

18. In a typewriting machine, the combination with a letter-feeding carriage, of a propelling spring-drum connected to said carriage, a set of co-operative brake-disks mounted on said drum to revolve therewith, a carriage releasing and tabulating mechanism, and an interponent set by said carriage-releasing mechanism into position to prevent movement of certain of said brake-disks, provision being made for a certain advance of the released carriage before movement of brake-disks is prevented by said interponent.

19. In a typewriting machine, a carriage, carriage-propelling means, a normally ineffective brake movable as a unit with the propelling means, and means for causing parts of the brake to become stationary and thereby to render the brake effective.

20. In a typewriting machine, a carriage, a spring-drum for moving the carriage, tabulating mechanism, a brake comprising a plurality of brake-disks mounted coaxially with the spring-drum and normally in fixed relation thereto, and brake-controlling means operable to permit all of the brake-disks to turn in unison when the tabulating mechanism is first operated and then to cause certain of them to move relatively to the others.

21. An article of manufacture for use in a typewriting machine, comprising, in combination, a spring-drum, a shaft fixed to the spring-drum, a plurality of friction-disks mounted on the shaft and rotatable relatively to it, and means including a yielding member adapted to connect the relatively rotatable friction-disks to a non-rotatable part of the typewriter.

22. In a typewriting machine, a spring-drum, and a brake mounted on the front thereof including adjustable parts and adjusting means on the front of the brake, said drum and brake being removable from and insertable in said machine as a unit.

23. In a typewriting machine, a carriage, a spring-drum for propelling the carriage, and a brake therefor arranged to move idly as a unit with the drum, the brake comprising a plurality of rotatable friction-disks mounted on the drum coaxially therewith.

24. In a typewriting machine, a typewriter-carriage, a spring-drum for propelling the carriage, a brake for the spring-drum comprising friction-disks in contact with each other, certain of the friction-disks being arched, and an adjustable member pressing against the disks for adjustably regulating the pressure between the contacting faces of the disks.

25. In a typewriting machine, a carriage, a spring-drum for propelling the carriage, and a brake therefor arranged to move idly as a unit with the drum, the brake comprising relatively rotatable friction-disks, and means for adjustably regulating the pressure of the disks against each other.

26. In a typewriting machine, the combination with a carriage, means including a spring-drum to urge the carriage in a letter-feeding direction, escapement mechanism to control the carriage and tabulating mechanism including means to release the carriage from the escapement mechanism, of normally ineffective retarding means fastened to and moving with the spring-drum and rendered effective by said tabulating mechanism, said retarding means comprising spring means offering a slight resistance to the action of the spring-drum and frictional means effective when the resistance of said spring means has been overcome, and separate adjustable means for setting the range of action of the spring means and the force of the frictional retarding means.

27. In a typewriting machine, in combination, a carriage, feeding means therefor including a spring-drum, and retarding means for said spring-drum mounted thereon and moving idly therewith, comprising two co-operating friction elements, and means for causing relative movement between the co-operative elements to create a frictional retardation of the carriage.

28. In a typewriting machine, in combination, a carriage, feeding means therefor including a spring-drum, and retarding means for said spring-drum mounted thereon and moving idly therewith, comprising two co-operating friction brake-elements, rotating in unison with the drum and normally engaging each other, and means to arrest one of said elements against rotation to cause a frictional retardation of the spring-drum, and hence of the carriage, through the relative movement between the co-operative brake-elements.

29. In a typewriting machine, in combination, a carriage, feeding mechanism therefor including a spring-drum, a retarding device for said spring-drum mounted to rotate idly therewith, comprising two co-operating friction elements normally engaging each other, a carriage release, and means actuated by the carriage release to arrest the rotation of one of said friction elements to

cause a relative movement between it and its co-operative element, creating a frictional retardation of the movement of the carriage.

30. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device mounted on said drum, comprising two co-operating friction elements, one of which is secured to the drum so that the device normally rotates idly therewith, a controlling member, means to limit the movement between said member and the second element, a carriage-releasing mechanism, and means actuable by said releasing mechanism to arrest said controlling member, the second element then moving with respect thereto until its limiting position is reached, whereby further rotation of the drum will be resisted by the relative movement of the two frictionally-engaged elements.

31. In a typewriting machine, in combination, a carriage, carriage-urging means including a spring-drum, a retarding device comprising two co-operating friction brake-elements, one of which is secured to the drum so that the device will normally rotate idly therewith, a ratchet-wheel yieldably connected to the second element and having a limited movement relative thereto, a carriage-releasing mechanism including a shaft extending transversely of the machine, an arm mounted on said shaft, and a pawl on the free end of said arm and associated with said releasing mechanism, and shiftable to arrest the wheel, so that the second element may move freely with respect to the wheel to a predetermined extent, and so that further rotation of the drum will be resisted by the two frictionally-engaged brake-elements.

32. The combination of a typewriter carriage, a spring to propel the same, feeding mechanism for the carriage, a carriage-releasing device, co-operative brake members for said carriage, said members both mounted and connected to revolve idly as the carriage moves, and means associated with said carriage-releasing device to arrest one of said co-operative brake members to enable it to co-operate with the other of said members to retard the released carriage.

33. In a typewriting machine, the combination of a power-driven carriage, co-operative brake members revolving idly as the carriage moves, and a part arranged to arrest one of said co-operative brake members after it has revolved a predetermined extent, enabling the brake members to co-operate in retarding the released carriage.

34. The combination of a typewriter carriage, a spring to propel the same, feeding mechanism for the carriage, a carriage-releasing device, co-operative brake members for said carriage, said members both mounted and connected to revolve idly as the carriage moves, means associated with said carriage-releasing device to arrest one of said co-operative brake members to enable it to co-operate with the other of said members to retard the released carriage, and adjustable means to set the frictional power between the brake members.

35. In a typewriting machine, the combination of a power-driven carriage, co-operative brake members revolving idly as the carriage moves, a part arranged to arrest one of said co-operative brake members after it has revolved a predetermined extent, enabling the brake members to co-operate in retarding the released carriage, and means to adjustably set the extent of the free movement between the part and its co-operating brake member.

36. In a typewriting machine, the combination with a letter-feeding carriage, a source of power for propelling the same, and means for effecting a jumping movement of the carriage, of co-operative members connected to form a unit to revolve idly as the carriage moves, and means for causing relative movement between said co-operative members at the jumping movement of the carriage, to retard the latter.

37. In a typewriting machine, the combination with a letter-feeding power-driven carriage, and means for effecting a jumping movement of the carriage, of two co-operative friction brake-elements connected to form a unit to revolve idly as the carriage moves, and means actuated at the jump movement of the carriage to engage one of the brake-elements, causing it to move relatively to its co-operating element and creating thereby a cushioning action at the end of the jumping movement.

38. In a typewriting machine, the combination with a letter-feeding power-driven carriage, and a jumping-movement mechanism for the carriage, of two co-operating friction brake-elements and a control member yieldably connected together to form a unit to revolve idly as the carriage moves, and means actuated at the jump movement of the carriage to arrest the control member, to cause it to stop one of the brake-elements, whereby further movement of the entire unit will be resisted, due to the relative frictional movement between the moving brake-element and the arrested break-element.

39. In a typewriting machine, the combination with a letter-feeding power-driven carriage, of two co-operating friction elements and a ratchet-wheel yieldably connected together to form a unit to revolve idly as the carriage moves, and a jumping-movement mechanism for the carriage, including a shaft, an arm mounted on the shaft, and a pawl on the free end of the arm, actuated at the jump movement to be shifted to engage the wheel and enable it to arrest

one of the friction elements, whereby further movement of the entire unit will be resisted, due to the relative frictional movement between the moving friction element and the arrested friction element.

40. In a typewriting machine, the combination with a letter-feeding carriage, a source of power for propelling the same, and means for effecting a jumping movement of the carriage, of co-operative members connected to form a unit to revolve idly as the carriage moves, means for causing relative movement between said co-operative members at the jumping movement of the carriage, to cushion the latter, and other means to adjust the cushioning effect at the end of the jump movement independently of the speed of the carriage.

41. In a typewriting machine, the combination of a power-driven carriage, co-operative brake-members for retarding the carriage, said members mounted as a unit to revolve idly as the carriage moves, and adjustable means to set the frictional power between the brake-members independently of the speed of the carriage.

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