No. 635,078. Patented Oct. 17, 1899.

J. B. PRICE.

TYPE WRITING MACHINE.

(Application filed Apr. 24, 1899.)

(No Model.)

Fig. 1.

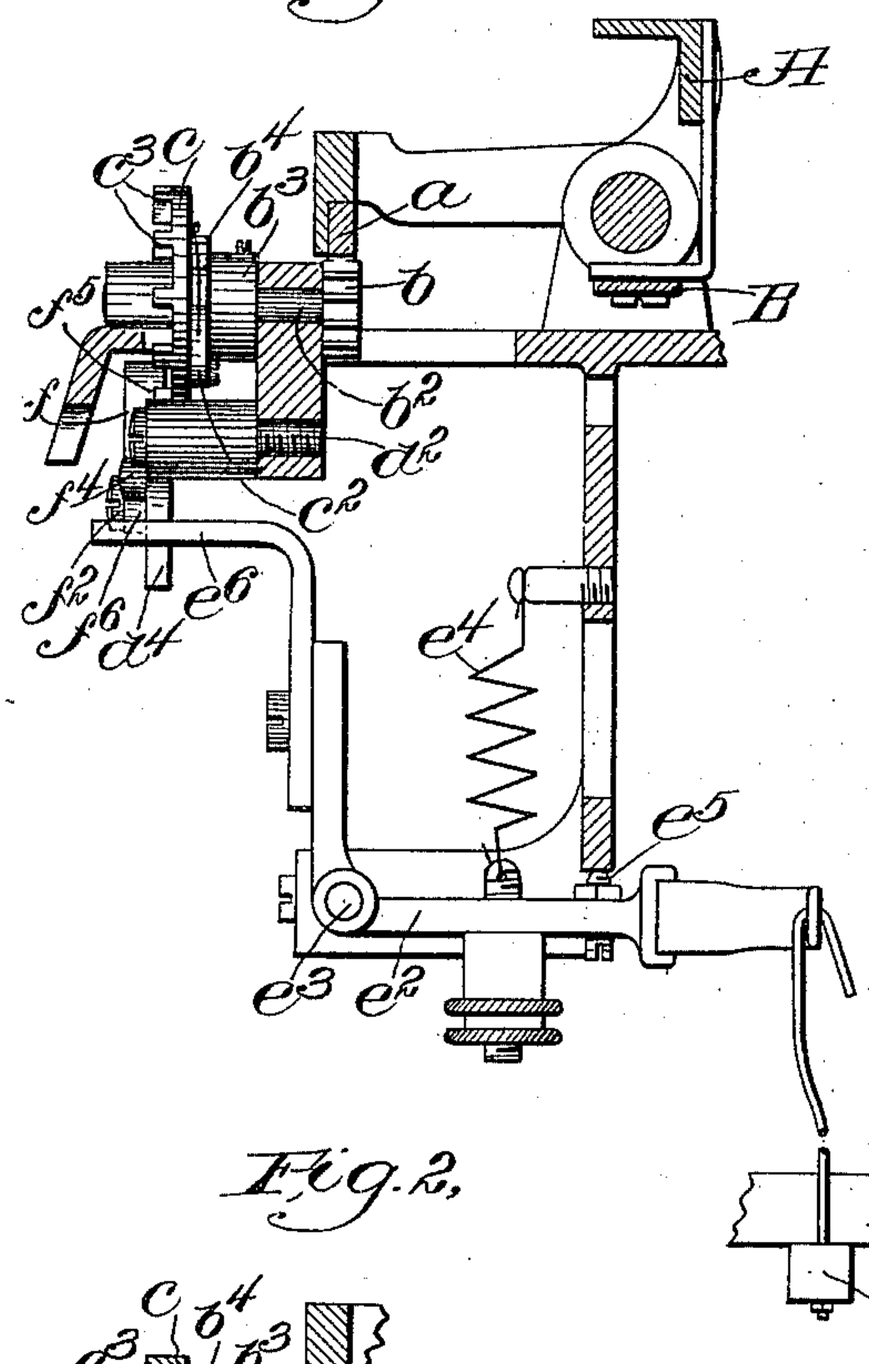


Fig. 3.

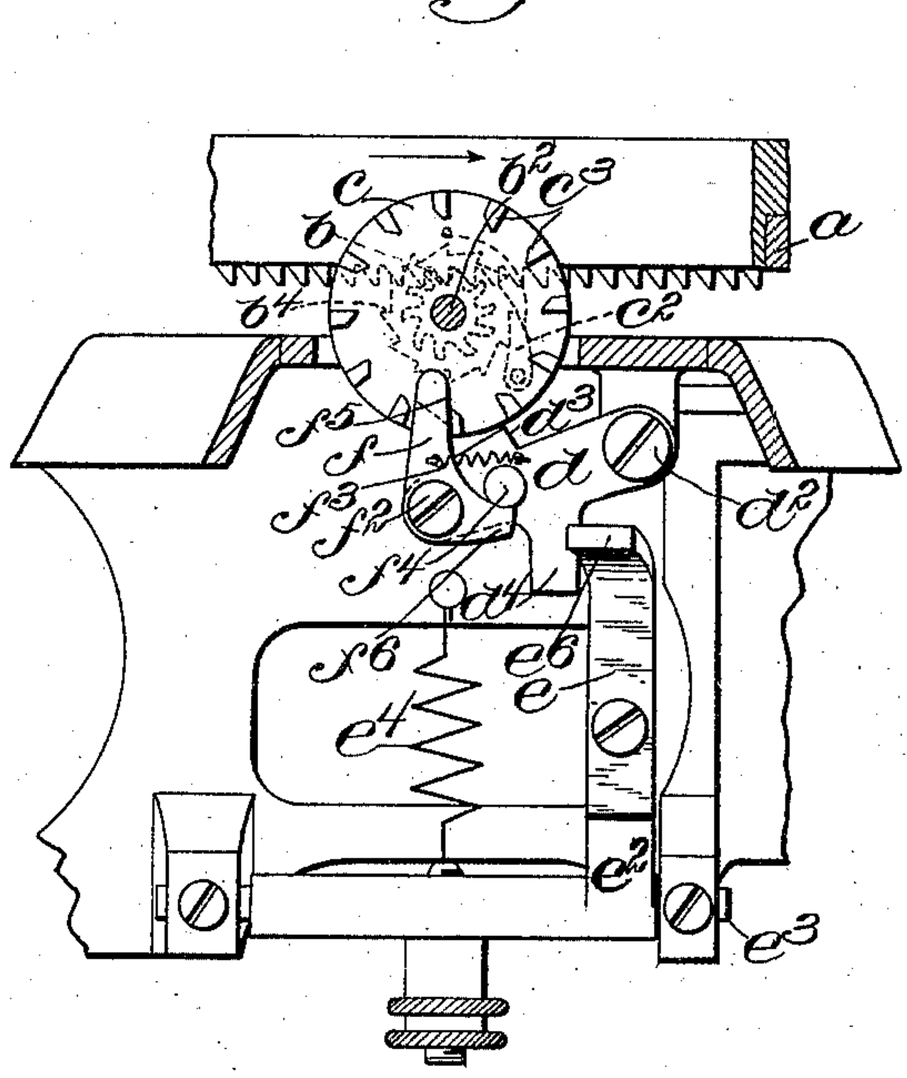


Fig. 2.

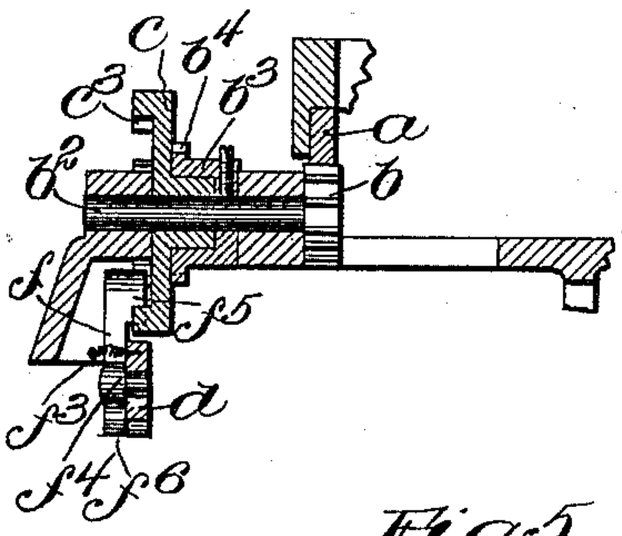


Fig. 4.

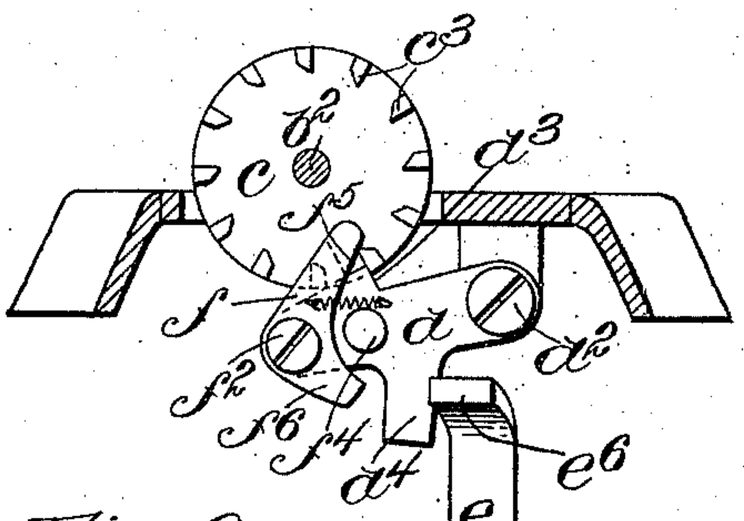


Fig. 5.

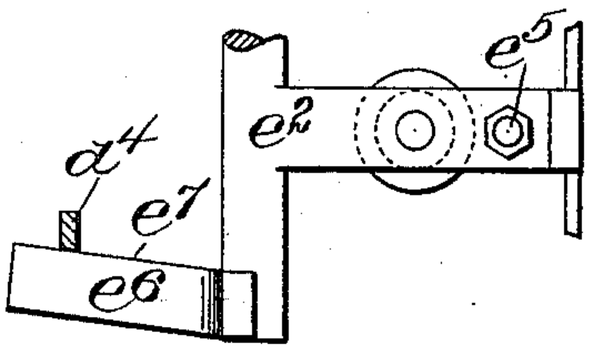
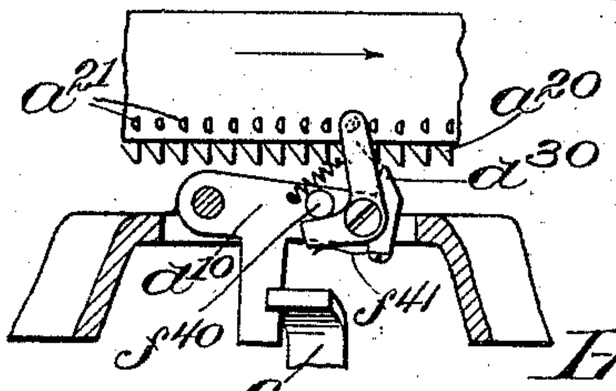


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN B. PRICE, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE MANHATTAN TYPEWRITER COMPANY, OF NEW JERSEY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 635,078, dated October 17, 1899.

Application filed April 24, 1899. Serial No. 714,271. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. PRICE, of Newark, county of Essex, and State of New Jersey, have invented an Improvement in Type-Writing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is embodied in a type-writer, and relates, mainly, to the letter-space-feed mechanism.

The invention consists in a novel construction of the escapement by which the spring-impelled carriage is permitted to advance as each letter is printed and in the spaces between the words; and it further consists in details of construction that will be hereinafter described.

Figure 1 is a side elevation of a feed-controlling device embodying the invention, part of the type-writer frame being shown in section. Fig. 2 is a longitudinal section of the parts as shown in Fig. 1. Fig. 3 is a rear elevation. Fig. 4 is a partial rear elevation showing the parts in a different position. Fig. 5 is a sectional plan view to illustrate the means for actuating the feed-dogs, and Fig. 6 a detail showing a modification.

The escapement mechanism forming the subject of this invention is applicable to machines of the well-known Remington type, being embodied in a machine in which the platen-carriage A or part that supports and feeds the paper is provided with a feed-rack *a*, having suitable teeth spaced to correspond to the spacing desired between consecutive letters of continuous printing. The said carriage is normally impelled in the direction from left to right, as seen in Fig. 3, by the main spring and connections, which may be of usual construction, as indicated at B, Fig. 1, and said carriage is permitted to advance a distance represented by one tooth of the feed-rack *a* at each operation of the universal bar C, produced by depression of any of the letter-key levers or of the space-key in the usual manner. The said rack *a* is shown as coöperating with a pinion *b*, mounted on a shaft or spindle b^2, having a suitable bearing in the type-writer frame, the said spindle having connected therewith a hub b^3, provided with ratchet-teeth b^4, coöperating with a pawl c^2 on a wheel or disk *c*, the said ratchet and pawl being so arranged that in the feed movement of the carriage the pinion *b* and disk *c* will travel together. In other words, the carriage when traveling in this direction can be controlled by controlling the disk *c*, although it is free to be moved in the opposite direction without a corresponding movement of said disk. The said disk, which of course has a constant tendency to rotate in response to the pull of the carriage by the main spring, is controlled in its movement by a retaining-dog *d*, pivotally supported at d^2, the pivotal support being so positioned that the engaging shoulder d^3 of the said dog moves in a direction approximately radial to the axis of the said disk *c*, which is provided with crown-teeth c^3, arranged to be engaged by the said shoulder. The said dog is further arranged in such a manner that except when held by the depression of a key in a position to engage the teeth it will be crowded out of engagement therewith after the manner of a latch in response to the tendency of the said wheel to rotate. The said retaining-dog is arranged to be moved into engagement with the teeth in any suitable way, as by means of a projection *e*, secured to one arm of the lever e^2, fulcrumed at e^3 and having its other arm suitably connected with the universal bar C, which is controlled by any of the key-levers D of the type-writer or by the space-bar. The said lever e^2 is normally held in the position shown in Figs. 1 and 3 by means of an adjustable spring e^4 and adjustable stop e^5, but is moved from said position each time the key is depressed. To coact with the retaining-dog *d*, the arm *e* has a projection e^6, having an inclined surface e^7, which lies in engagement with a portion of the said dog, (shown as an arm or projection d^4,) it being obvious that when the said arm is moved by the depression of a key it will throw the dog from the position shown in Fig. 3 to the position shown in Fig. 4. As soon, however, as the key is released so that the arm *e* returns to its normal position, the tendency of the disk *c* to rotate will crowd the dog out of the

way, permitting the further movement of the said wheel and consequent feed movement of the carriage. The extent of such movement is controlled by the supplemental dog f or "let-off" dog, as it is commonly called, which is pivoted at f^2 upon the dog d and controlled in its movement by a spring f^3 and stop f^4. In the position shown in Fig. 3 the carriage is under the control of the said let-off dog, the engaging surface f^5 of which is in contact with one of the teeth c^3, while the tail f^6 of the dog is in engagement with the stop f^4, so that the movement of the wheel c is arrested. Upon striking a key, however, the dog d is thrown into operative position, engaging one of the teeth c^3 and preventing the movement of the disk as the type-bar is thrown up, this same movement of the dog d, however, carrying the engaging portion f^5 of the let-off dog f beyond the tooth which it is engaging, allowing the said let-off dog to move in response to its spring f^3. As shown in Fig. 4, the spring f^3 throws the said let-off dog f into contact with the same tooth which is engaged by the retaining-dog d, it being obvious that as soon as the said dog d is released from the action of the key the tooth will come under the control of the dog f, so that the disk is allowed to turn until the said dog f is arrested by the stop f^4. Furthermore, it will be seen that the movement which disengages the dog d tends to draw the dog f into better engagement with the tooth, so that there is no possibility of skipping or, in other words, permitting the disk to travel more than the distance between two consecutive teeth.

It will be seen from the foregoing description that the retaining-dog and the let-off dog both travel in the same direction and move toward and from the teeth, respectively, at opposite sides thereof, so that the let-off dog is released from one tooth and actually moved into engagement with the next tooth during the movement of the retaining-dog toward the disk. When, therefore, the retaining-dog is moved away from the disk, the let-off dog is already in engagement with one of the teeth instead of being moved into engagement therewith in response to the disengaging movement of the retaining-dog, as is the case with most devices of this kind as heretofore constructed. This is accomplished by arranging the pivotal axis of the retaining-dog substantially parallel with the axis of the controlling-disk or transverse to the direction of movement of the teeth, so that in the independent movement of the let-off dog the next tooth is in the path thereof ready to be engaged thereby, the said dogs being connected together so as to move in the same direction at each operation. The engaging movement of the retaining-dog thus causes both the disengaging and reëngaging movements of the let-off dog.

To permit the restoring of the carriage in the disk construction above described, the spindle b^2, as has already been stated, is mounted independently of the disk c, which is shown as having a bearing upon the said spindle, the parts being connected by the ratchet b^4 and pawl c^2, so that the return movement of the carriage can take place without a corresponding movement of the disk c.

While the wheel or disk construction is probably the best practical embodiment of this invention, it is obvious that the construction may be modified without departing from the invention and that substantially the same operation of the retaining and let-off dogs may be provided for in conjunction with rectilinear controlling-teeth as those of the rack itself. As shown, for example, in Fig. 6, the engaging portion d^{30} of the retaining-dog d^{10} is arranged to be moved into engagement with the teeth a^{20} of the rack a^{10}, while the let-off dog is mounted on said retaining-dog, so as to move in the same direction as in the construction above described. Thus in the engaging movement of the retaining-dog the let-off dog travels in the same direction to become disengaged from the teeth at the opposite side, the teeth being arranged as before, so that the dogs are respectively at opposite sides thereof. For a purpose to be hereinafter described it is desirable that the teeth which coöperate with the let-off dog should project laterally from the controlling member, it being obvious that one set of such teeth might be used for both dogs, as in the disk construction above described, although the same result may be obtained, as shown, by having two sets of teeth a^{20} and a^{21}, the former to coöperate with the retaining-dog and the latter to coöperate with the let-off dog. As herein shown, the latter teeth are arranged on the side of the rack and project laterally therefrom, so as to lie in the path of the let-off dog, which passes out of engagement with one tooth and into engagement with the next tooth during the engaging movement of the retaining-dog.

The retaining-dog is provided with a stop f^{40}, corresponding to the stop f^4 above described, said stop coöperating with the let-off dog to control the movement of the rack when the retaining-dog is out of engagement therewith, and in order that the carriage may be restored freely the said let-off dog is controlled in its movement in the opposite direction by a yielding stop f^{41}, so that when the retaining-dog is in its lowermost position out of engagement with the rack the let-off dog will ratchet along the under side of the teeth which coöperate with it to permit the restoring movement of the carriage.

Apart from the desirability of permitting the free restoring movement of the carriage it is obviously not essential that crown-teeth or laterally-projecting teeth should be employed, it being only essential so far as relates to the feeding operation that the let-off dog should engage the teeth at the side opposite that engaged by the retaining-dog, so that when the two dogs move together in the

same direction one will disengage while the other engages, thus permitting the let-off dog to move into engagement with the next tooth while the feed member is still under control of the retaining-dog.

It is not intended to limit the invention to the specific construction and arrangement shown and described, since modifications may obviously be made without departing from the invention.

I claim—

1. In a type-writing machine, the combination with the letter-space-feed-controlling teeth; of a retaining-dog; a let-off dog mounted on and carried by said retaining-dog and adapted to be moved out of engagement with the said teeth in response to the movement of the retaining-dog into engagement with said teeth; and means for causing said let-off dog to reëngage the said teeth as soon as it has been thus disengaged, as set forth.

2. In a type-writing machine, the combination with the carriage-feed rack; of a disk adapted to be rotated in the forward movement of said rack, said disk being provided with teeth; a retaining-dog adapted to be moved into the path of said teeth, and a let-off dog carried by said retaining-dog and adapted to disengage one tooth of the disk and engage with the next in the movement of the retaining-dog into engagement with the disk, substantially as described.

3. The combination with the letter-space-controlling teeth projecting laterally from the controlling member, of a retaining-dog having a pivotal axis transverse to the direction of movement of said controlling member, and a let-off dog mounted on and pivotally connected with said retaining-dog, the engaging portion of said dogs both being at the same side of the pivotal axis of the retaining-dog, as set forth.

4. The combination with the letter-space-controlling teeth projecting laterally from the controlling member, of a retaining-dog having a pivotal axis transverse to the direction of movement of said controlling member, and a let-off dog mounted on and pivotally connected with said retaining-dog, and means for moving said retaining-dog into the path of said teeth, the same movement carrying the let-off dog out of such path at the opposite side of the teeth, substantially as described.

5. The combination with the letter-space-controlling teeth projecting laterally from the controlling member, of a retaining-dog having a pivotal axis transverse to the direction of movement of said controlling member, and a let-off dog mounted on and pivotally connected with said retaining-dog, means for moving said retaining-dog into the path of said teeth, the same movement carrying the let-off dog out of such path at the opposite side of the teeth, and means for moving said let-off dog into engagement with the next tooth while the retaining-dog is still in engagement with one of the teeth, substantially as described.

6. The combination with the letter-space-controlling disk having crown-teeth, of a retaining-dog at one side of said teeth and movable in a direction transverse to the axis of said disk into and out of the path of said teeth, a let-off dog at the opposite side of said teeth, said let-off dog being mounted on said retaining-dog and movable therewith, and means for independently moving said let-off dog after it is disengaged from a tooth by the engaging movement of the retaining-dog to cause the said let-off dog to engage the next tooth prior to the disengaging movement of the retaining-dog, substantially as described.

7. In a type-writing machine, the combination with the carriage-feed rack; of a pinion meshing therewith, a disk connected with said pinion and provided with crown-teeth; a retaining-dog adapted to be moved into engagement with said teeth and to be automatically disengaged therefrom when released; a device for moving said retaining-dog into engagement with said teeth in response to the operative movement of a key and for releasing the same when said key is released; a let-off dog pivotally connected with said retaining-dog and normally in engagement with one of the teeth on said disk; and means for causing said let-off dog to pass out of engagement with such tooth and into engagement with next tooth when said retaining-dog is thus moved, as set forth.

8. The combination with the paper-carriage; of a wheel or disk controlling the forward feed movement thereof, said disk being provided with teeth or engaging portions; a retaining-dog and a let-off dog movable with relation to said teeth in a direction approximately radial to the axis of said disk, the let-off dog being pivotally connected to the retaining-dog and arranged to be moved out of engagement with one tooth as the said retaining-dog is moved into engagement with another; means for causing said let-off dog to move into engagement with the tooth engaged by the retaining-dog in order to coöperate therewith in the control of the feed when said retaining-dog moves out of engagement therewith; and means for causing a movement of said retaining-dog toward the teeth in response to the depression of a key, the opposite movement being independent thereof, substantially as described.

9. The combination with the feed-rack; of a pinion meshing therewith; a feed-controlling disk provided with teeth and connected with said pinion by a ratchet and pawl; a retaining-dog movable into the path of said teeth and adapted to be automatically disengaged therefrom when released; an arm movable in response to the depression of the key and having an inclined surface adapted to produce the movement of the retaining-dog into engagement with a tooth; and a let-off dog carried by said retaining-dog and ar-

ranged to control the movement of the disk when the retaining-dog is disengaged therefrom, as set forth.

10. The combination with the controlling-disk *c* provided with the teeth c^3; of the retaining-dog *d* and let-off dog *f* arranged to have an approximately radial movement with relation to said teeth, means for positively producing a movement of said dogs in one direction but not in the other; the spring f^3 adapted to move the let-off dog into engagement with the tooth controlled by the retaining-dog; and the stop f^4 to limit the movement of said let-off dog when the retaining-dog is disengaged from the disk, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN B. PRICE.

Witnesses:
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JOSEPH PHELPS.