

T. E. BUSCHMANN.
PAPER CARRIAGE FEED MECHANISM OF TYPE WRITERS.
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994,973.

Patented June 13, 1911.

Fig. 2.

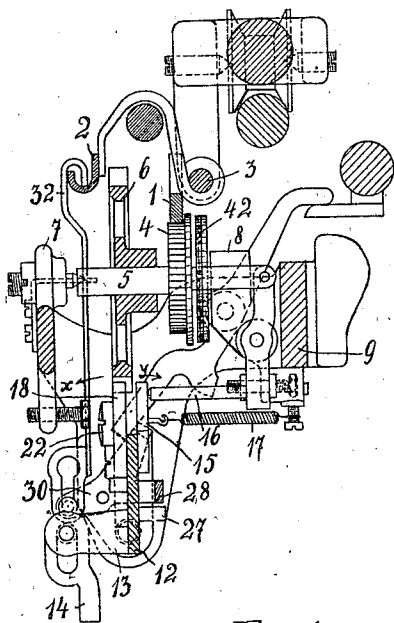


Fig. 1.

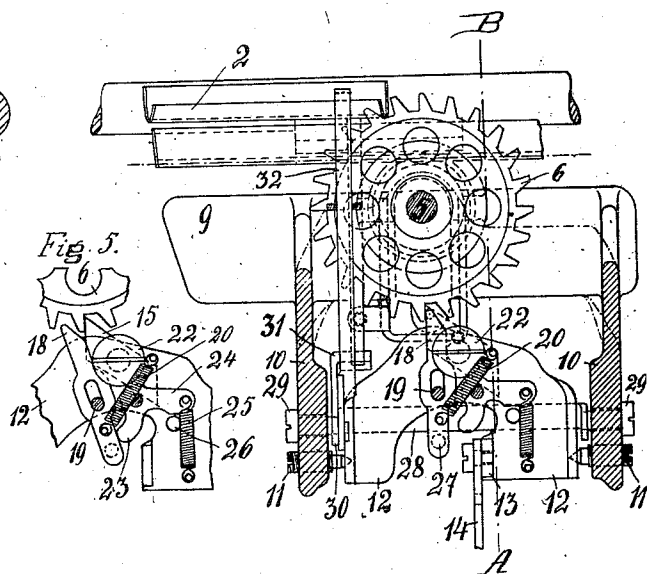


Fig. 4.

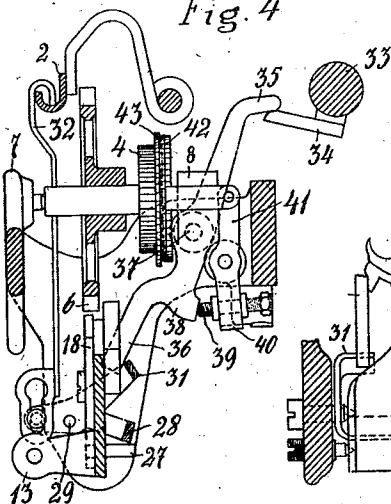
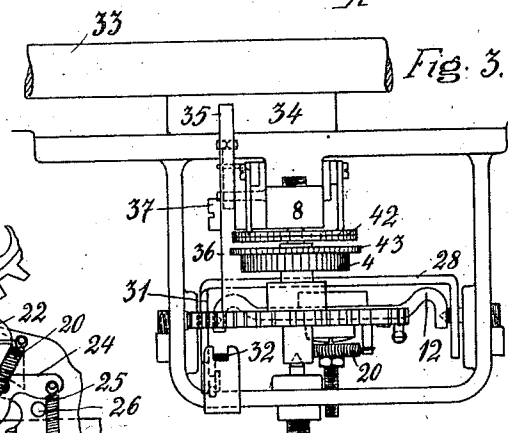
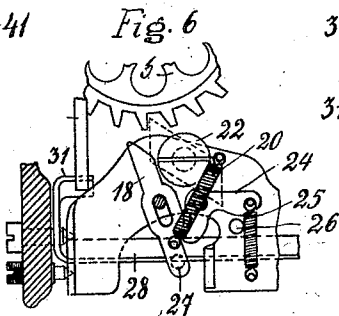


Fig. 6.



WITNESSES

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PAPER-CARRIAGE-FEED MECHANISM OF TYPE-WRITERS.

994,973.

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To all whom it may concern:

Be it known that I, THEODOR EUGEN BUSCHMANN, mechanical engineer, a subject of the Emperor of Germany, residing at Neefestrasse 51, Chemnitz, Saxony, Germany, have invented new and useful Improvements in Paper-Carriage-Feed Mechanism of Type-Writers, of which the following is a specification.

My invention relates to the paper carriage feed mechanism of typewriters.

The paper carriage of a typewriter is moved intermittently in the following well-known manner: The paper carriage is constantly pulled to the right by a drawband but cannot move freely because it is prevented by a rack which meshes with a rigidly held pinion. This pinion and an escapement wheel are rigidly secured to a shaft which is mounted only so as to rotate in the machine frame, and the escapement wheel is locked by a device which after one stroke on a key permits the wheel to rotate only one tooth. Such locking and feeding devices most used heretofore have as their main characteristic a detent and a pawl which can be moved in common crosswise to the teeth of the escapement wheel. The detent can only make this one movement; the pawl, on the contrary, is driven by a moving tooth of the wheel, after the latter has been released by the detent, until the pawl strikes a rigid abutment and stops the escapement wheel. The detent and pawl are then pushed back crosswise to the wheel, the pawl is disengaged from the tooth of the wheel, and, being pulled by a spring, returns into its original position. This engaging and advancing pawl in some forms of construction is movable like a slide tangentially to the escapement wheel; in other forms it is pivotally arranged as an ordinary pawl on a pivot mounted on the detent itself, or is on a dog rocker rigidly connected to the latter. Both arrangements are however unsuitable because the rigid abutments, which determine the path of the pawl, prevent the pawl from yielding in front of the ratchet wheel teeth when the carriage is moved toward the left. For this purpose it was usually necessary to uncouple the escapement wheel from the rack gear, which rendered a special device necessary, *i. e.* a carriage release device. It was

also necessary to first disengage the rack from the teeth of the pinion when it was desired to bring the carriage to a predetermined place in its path.

An important object of my invention is to attain greater safety of operation with materially simpler means than could be said to attach to even the latest types of feeding devices. This increased safety of operation is attained by means of the following improvements:—Firstly, the movable pawl is a small, light and by reason of its small size an exceedingly freely-movable body whose face coacting with the tooth of the escapement wheel comes into a position exactly radial to the wheel, while the pawl itself can be withdrawn from the wheel tooth in exactly the same radial direction, but, on the other hand, when the escapement wheel is turned back, is adapted to disengage from the teeth thereof. Another important improvement is the arrangement of a brake which is connected to the device which allows the paper carriage to come completely under the control of its draw spring when the tabulator is being used, so that the carriage can no longer strike sharply against the tabulator abutments, but advances with an even and moderate speed in the right-hand direction.

The advantages secured by the above mentioned devices for the manipulation of the machine are:—(1) that when disengaging the pawl from the escapement wheel only the friction between the faces of the two parts has to be overcome, so that the escapement wheel does not require to be pressed back as was formerly necessary; (2) that the escapement wheel can be rotated back over the pawl without the use of any special device, and (3) that the brake moderates the speed of the freely-running carriage simultaneously as the pawl is disengaged during the use of the tabulator.

One illustrative embodiment of my invention is represented by way of example in the accompanying drawings, wherein:—

Figure 1 is a front elevation, the front wall of the hanger-bearing having been cut away; Fig. 2 is a section on the line A—B in Fig. 1, as seen from the right-hand side of the machine; Fig. 3 is a plan view, the paper carriage together with its carrying rail and

guiding rail having been removed; Fig. 4 is a view similar to Fig. 2 and shows the position of the several parts when the tabulating device is set in operation; Fig. 5 is an elevation showing particularly the arrangement of the pawl and its abutments in the position when the detent engages with the escapement wheel, and Fig. 6 is a general view of the same parts shown in Fig. 5 and is at the same time an elevation of part of the device as shown in Fig. 4.

In order that my improved mechanism may be more easily understood, the well-known parts of the feeding device are designated as follows:—

1 is the rack of the paper carriage, and 2 is the trough-shaped rail which is swung upward around the rod 3 when the paper carriage is to be independent of the feeding device. The rack 1 is in constant mesh with a pinion 4 mounted on a shaft 5, on which is also rigidly mounted the escapement wheel 6. The shaft 5 is journaled between two bearings one of these being screwed through the front wall 7 of the hanger-bearing, while the other is screwed through a bracket 8 on the rear wall of the hanger-bearing whose side walls are indicated by 10.

11 are two pointed set screws which pass through the side walls 10 and serve as a pivotal support for the dog rocker 12, which is pressed out of sheet iron. This rocker 12 has an arm 13 projecting toward the front, to which is attached a draw rod 14, this draw rod being in connection with the universal bar and moving down when a key is depressed. Thereupon the upper end of the rocker 12 oscillates in the direction of the arrow α (Fig. 2) crosswise to the teeth of the escapement wheel, and brings the detent 15, which is rigidly connected to the rocker 12, within reach of the teeth of the escapement wheel. The rocker 12 is returned in the direction of the arrow γ up to the abutment pin 16 by a tension spring 17.

The features of the mechanism which forms the subject-matter of my invention will now be described commencing with the pawl 18. This pawl is mounted free to move upon the dog rocker 12 by means of a screw 19 on which it can both rotate and, owing to its longitudinal slot, be displaced in a longitudinal direction. The pawl 18 is constantly pulled upward and at the same time around to the left by means of a weak spring 20 attached to a downward extension of the pawl. When the ratchet wheel 6 presses the pawl 18 toward the right (Fig. 1) the latter bears against the shaft of a screw 22, the head of which on that side turned toward the pawl 18 is slightly beveled, to guide the pawl upon returning to its normal position (Fig. 1) and to assist in holding it against the rocker 12. The head of the bolt is of such dimensions that when the pawl 18 is released by

the ratchet wheel 6 it is still engaged by said head, as is shown in Fig. 5. As is also seen from the same figure, the lower extension of the pawl 18 lies against an abutment which is constructed as an angle lever 23, 24. The arm 24 is held elastically by means of a tight spring 25 against a rigid stop 26. If the ratchet wheel 6 be now rotated clockwise, the pawl 18 will first only move as far as the lever arm 23, the teeth of the ratchet wheel will strike on the inclined face of the pawl 18 and force the latter to yield still farther, and then the stop 23 which is elastically held by means of the spring 25, will yield, the result being that the lever arm 24 is lifted by jerks from the rigid stop 26. When the carriage is fed normally, the arm 23 will however provide a quite firm abutment for the pawl 18 so that it can only snap into the next gap of the ratchet wheel. If it is desired to release the paper carriage completely from the pawl and ratchet mechanism the pawl 18 is withdrawn in a radial direction from the teeth of the ratchet wheel. A pin 27 projecting from the lower extension of the pawl 18 serves for this purpose, said pin being influenced by an oscillating member 28 journaled between two screws 29. This member is provided on the left-hand side (Fig. 1) with a forwardly directed lever 30 and a lever 31 inclined upward to the rear, the front end of the latter being bent at an angle toward the center of the hanger-bearing (Fig. 1). A vertically upwardly extending draw rod 32 is pivotally connected to lever 30, the upper end of this rod being hook-shaped and suspended from the above mentioned rail 2 of the paper carriage. Consequently when the rail 2 is raised the draw rod 32 must follow, the member 28 and its levers 30, 31 are rotated, and the member 28 coacts with the pin 27 and withdraws the pawl 18 from the ratchet wheel 6. Then the carriage is free.

When the tabulating device is being used it is necessary to release the carriage every time the text of the line is typed, in order that the carriage may reach the tabulating stops for writing the numbers. How this is effected by the mechanism according to my invention is shown in Fig. 4. The tabulator rod 33 is provided with a plate 34 upon which rests the upper end of the lever 35, 36. This lever is fulcrumed at 37 on the support 8 and the lower arm of this lever coacts with the above mentioned lever 31, and simultaneously by means of the lug 38 with the adjusting screw 39 in a second lever 40, 41 pivotally supported intermediate its ends. This lever when actuated, presses a leather-covered brake disk 42 in the direction of shaft 5 against the enlarged face 43 of the pinion 4. This arrangement very effectively prevents the shaft 5 jamming and bending, and also prevents any tendency which its

centering set screws may have toward assuming an inclined position. Moreover, the screw 39 provides a means for altering the brake power as desired.

As mentioned above, the operation of the device will be understood from Fig. 4. When the tabulator rod 33 has been rotated clockwise and has rotated the lever 35 a small distance about its fulcrum 37, the lever arm 36 exerts pressure on the bent end of the bridge lever attachment 31 and the bridge 28 disengages the pawl 18 from the ratchet wheel 6 by means of the pin 27. At the same time the attachment 38 strikes the adjusting screw 39 of the lever 40, 41 and presses the braking plate 42 against the face 43. By this means the brake power is applied to the pinion 4, and consequently to the paper carriage, while the escapement wheel is released. The carriage therefore travels at an equal and constant speed against the tabulator stop. Fig. 6 shows the pawl 18 withdrawn from the teeth of the escapement wheel 6.

I claim:—

1. In feeding mechanism for paper carriages of typewriters, the combination, with the frame and an escapement wheel journaled therein, of a dog rocker mounted in said frame, a spring-pulled lever fulcrumed on said rocker, a spring-controlled pawl mounted on said rocker and normally coacting with said wheel, said pawl being mounted to rotate and move radially relatively to said wheel out of engagement therewith, and having an extension adapted to coact with said lever, and an abutment for holding said pawl in its normal position.

2. In feeding mechanism for paper carriages of typewriters, the combination, with the frame and an escapement wheel journaled therein, of a dog rocker, carrying a detent, mounted to rock in said frame, a spring-pulled lever fulcrumed on said rocker, a spring-controlled pawl mounted on said rocker and normally coacting with said wheel, said pawl being mounted to rotate and move radially relatively to said wheel out of engagement therewith, and having an extension adapted to coact with said lever, and an abutment for holding said pawl in its normal position; means for moving said pawl radially out of engagement with said

wheel, and means operated by the latter means for braking said escapement wheel.

3. In feeding mechanism for paper carriages of typewriters, the combination, with the frame, and a shaft, carrying an escapement wheel and a pinion, pivoted therein, of mechanism comprising a pawl and a detent for controlling said escapement wheel, a brake, a lever operatively connected with said brake, and a second lever for actuating the first mentioned lever and applying said brake to said pinion.

4. In feeding mechanism for paper carriages of typewriters, the combination, with the frame, and a shaft, carrying an escapement wheel and a pinion, pivoted therein, of mechanism comprising a pawl and a detent for controlling said escapement wheel, a brake, a lever, having an adjustable member associated therewith, operatively connected with said brake, and a second lever adapted to coact with said member to actuate said first mentioned lever to apply said brake to said pinion.

5. In feeding mechanism for paper carriages of typewriters, the combination, with the frame and an escapement wheel journaled therein, of a dog rocker mounted in said frame, a spring-pulled lever fulcrumed on said rocker, a spring-controlled pawl mounted on said rocker and normally coacting with said wheel, said pawl being able to rotate and move radially relatively to said wheel out of engagement therewith, and having an extension adapted to coact with said lever, and an abutment for holding said pawl in its normal position, said pawl carrying a pin, a bridge adapted to rock and coact with said pin, a two-armed lever for actuating said bridge and removing said pawl from the escapement wheel, a brake for applying a braking action to said wheel, and a lever operatively connected with said brake and adapted to be actuated by said two-armed lever.

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

THEODOR EUGEN BUSCHMANN.

Witnesses:

WM. J. KAUFETSUY,
M. W. BRUNSWICK.