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PATENTED FEB. 12. 1907.

F. SCHÜLER.

VARIABLE FEED MECHANISM FOR TYPE WRITERS.

APPLICATION FILED APR. 10, 1906.

2 SHEETS—SHEET 1.

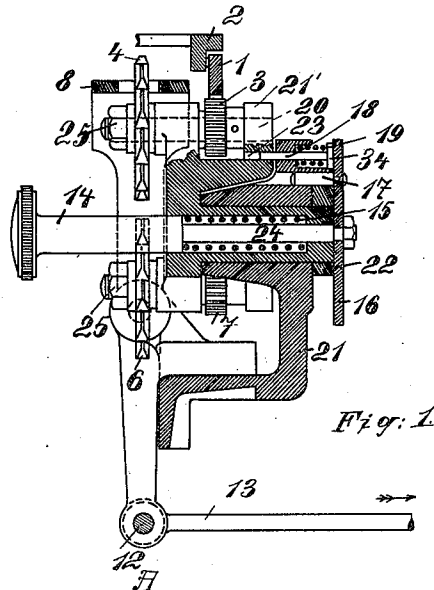


Fig. 1.

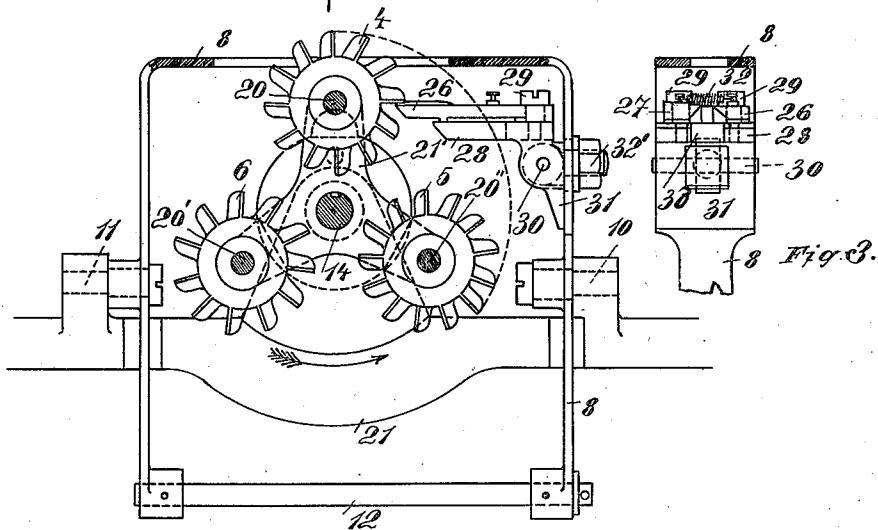


Fig. 2.

Witnesses.

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by Georgi Massis
Att'y

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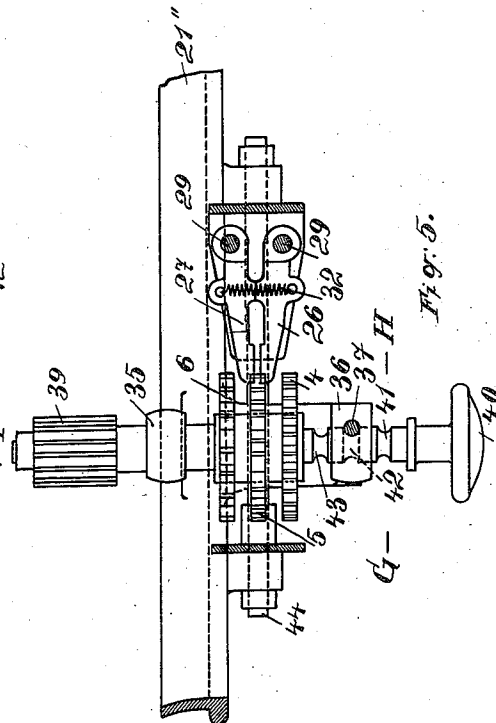
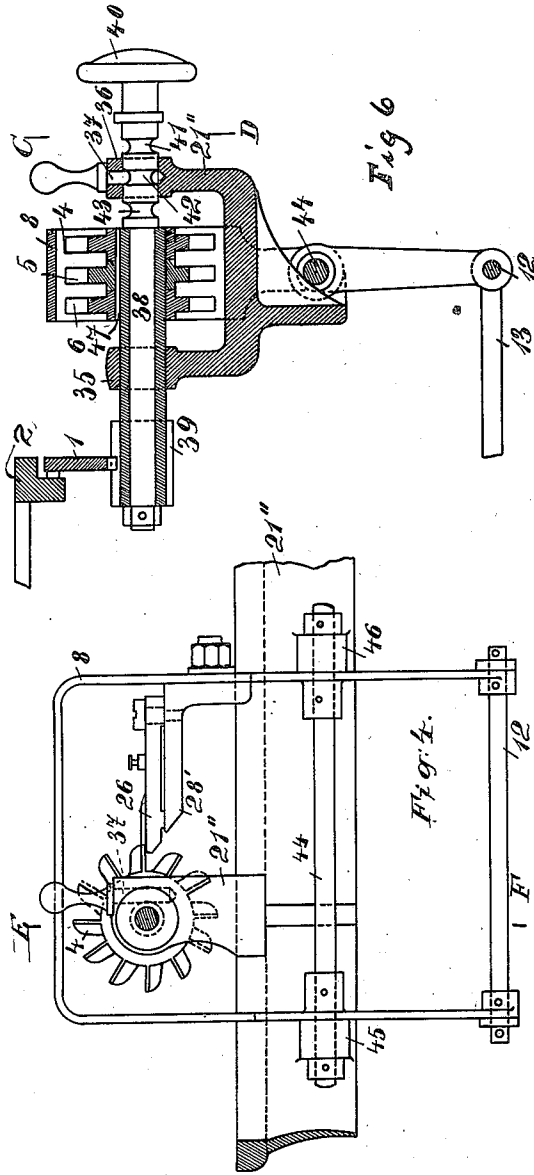
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2 SHEETS—SHEET 2.



Witnessed
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UNITED STATES PATENT OFFICE.

FRANZ SCHÜLER, OF BERLIN, GERMANY.

VARIABLE-FEED MECHANISM FOR TYPE-WRITERS.

No. 844,289.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed April 10, 1906. Serial No. 310,933.

To all whom it may concern:

Be it known that I, FRANZ SCHÜLER, engineer, a subject of the King of Prussia, residing at No. 24 Grimmstrasse, Berlin, Kingdom of Prussia, have invented certain new and useful Improvements in Variable-Feed Mechanism for Type-Writers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to a variable-feed mechanism for type-writers; and the object of my invention is to enable the carriage-feed to be adjusted according to requirements, the construction being such that the detent members of the escapement are not in immediate engagement with the rack secured to the carriage, but are connected therewith by spur and escape wheels.

In some existing systems of type-writing machines the detents can only be adjusted to omit a tooth of the rack, by doing which the extent of carriage displacement or feed is doubled. By my invention it is rendered possible to adjust the carriage-feed through any fraction or multiple of the space between two teeth of the rack. It has also been proposed to provide means whereby the carriage is shifted unequally to provide for an even spacing between characters of dissimilar width in the same font of type, as the letters "m" and "i." By my invention, even where the feed is uniform for all characters in the same font, the feed movement is increased or diminished uniformly to correspond to a different font. This device is therefore of special importance for type-writers having exchangeable sets of type of different widths. In such cases it was heretofore necessary to unscrew and exchange the entire escapement, which is rendered unnecessary by adopting this invention.

My invention consists, substantially, in so arranging several escape-wheels or racks having different pitches that they can be brought alternatively into engagement with the detents. The escape-wheels can either be arranged radially around a common axis, by turning which they are brought into the operative position, or they can be arranged side by side on a common spindle, by longitudinally moving which any desired one of said ratchet-wheels can be brought into operative relation with the detents.

The invention consists, further, in the combination of parts described in the following specification and set forth in the claims.

In the accompanying drawings, illustrating the invention, Figure 1 is a vertical section on A B of Fig. 2, showing one construction of the device, in which three escape-wheels are arranged radially around a common axis. Fig. 2 shows the same device in front elevation. Fig. 3 is a side view of the detents as seen from the left in Fig. 2. Fig. 4 is a rear elevation and part section on C D of Fig. 6, showing another construction of the machine, in which the escape-wheels are arranged on a common spindle. Fig. 5 shows the same device in plan, and Fig. 6 a section on E F of Fig. 4.

Referring to Figs. 1-3, 2 is the carriage of the type-writer, to which the toothed rack 1 is secured in the usual manner. 4, 5, and 6 are the impulse members, in the form of ratchet-wheels having different numbers of teeth, each escape-wheel being connected with a spur-wheel to operate the rack 1. For example, on the spindle 20, carrying the escape-wheel 4, is secured the spur-wheel 3, which is shown in engagement with the toothed rack 1 in the drawings. On the spindle 20', carrying the escape-wheel 6, is secured the spur-wheel 7. The spur-wheel on the spindle 20'', carrying the escape-wheel 5, is not shown in the drawings. The spindles 20 20' 20'' are journaled in a star-shaped frame 21', which is so mounted on a part 21, secured to the machine, that it can be turned when a coupling is released. The escape-wheels 4 5 6 are secured at the front by nuts 25. Said part 21' can only be turned when the rack 1 is brought out of engagement with the particular spur-wheel in known manner—for example, 3. For the purpose of turning the frame 21' a button 14 is provided, which is acted upon by a spiral spring 15, which surrounds the spindle 24 and presses the button to the left. At the end of the shaft 24 is provided a disk plate 16, carrying a pin 17, for which three recesses are provided in the frame 21. When the button 14 is pressed to the right, Fig. 1, the pin is moved out of its seat, and on turning said button through one-third of a revolution springs into the second recess. The annular piece 22 serves as a distance-piece. Said recesses for the pin 17 are so arranged in frame 21 that the various escape-wheels 4 5 6 or the respective spur-wheels 3 7, connected with the

same, are brought into the proper position in regard to the toothed rack 1. Between the bearing 21 and the star-shaped frame 21' a special coupling device is also provided, which consists of a pin 18, pressed to the right against the plate 16 by a spring 19, acting on a collar 34, and which when the button 14 is in the position shown in Fig. 1 projects into the hole 23 in the star-shaped frame 21'. Three such holes 23 are disposed in the frame 21', each of which corresponds to one position of the three escape-wheels. The detent member of the escapement is constructed as follows: In the yoke 8, pivoted to the frame at 10 and 11 and adapted to be moved by the rod 13, is provided a detent-support 28, which can be tilted upward about the pin 30, secured by the screw 32'. Said support is prevented from moving downward by a stop 31'. On this support 28, which has a slot 33, are fitted the two detents 26 27, the detent 27 being adapted to turn in a horizontal plane about 29. The left detent 27 is somewhat higher than the right one, 26. A spring 32 keeps the detents together. It will be evident that when the yoke 8 is swung by the depression of a type-key in the direction of the arrow, Fig. 1, a tooth of the escape-wheel 4 will press the detent 27 aside, and the tooth will pass through the opening formed. The detent 26 is preferably fixed so that it cannot turn. As soon as the tooth has passed, the spring 32 moves the detent 27 back into its first position, whereupon, the yoke 8 having again returned to its original position, the next tooth of the escape-wheel will strike upon the detent 26, and the carriage will have moved through one letter-space.

The adjustment or exchange of the escape-wheels is carried out as follows: After the rack 1 has been brought out of engagement with the spur-wheel—for example, 3—in known manner the button 14 is pressed to the right, so that the coupling 17 is released, and in doing this the coupling 18 is also released, as the spring 19 moves the pin 18 to the right. The pin on which the button or knob 14 is mounted being prevented by a key from turning relatively to the star-shaped frame 21', this latter will likewise be turned, when the button is turned, in the direction of the arrow, Fig. 2, until the pins 17 and 18 spring into the corresponding holes. In this case the next escape-wheel will be in engagement with the detents. As the detent-support 28 is adapted to tilt upward, the escape-wheel can pass by the same, raising it somewhat, or the ratchet-wheel can pass between the detents 26 and 27 by pushing the detent 27 aside.

In the construction shown in Figs. 4-6 the yoke 8, whose axis 44 turns in the bearings 45 46, operates the detents in the same manner as in the construction described above with reference to Figs. 1 to 3. The support 28' for the detents need not turn up-

ward in this case, and is accordingly screwed fast, as shown in the drawings. The escape-wheels 4 5 6 are arranged side by side, being fixed on a sleeve 47' by a key 47, said sleeve being adapted to turn on the pin 38, carrying the broad spur-wheel 39, which engages with the rack 1. The sleeve can be moved longitudinally in the bearing 35 of the frame 21". In the other bearing 36 the pin 38, carrying the button 40, can be moved longitudinally. Said pin 38 has several grooves 41 42 43, whose distance apart corresponds with the space between the ratchet-wheels. A pin 37, disposed at the top of the bearing 36, projects into one or the other of said grooves—for example, 42—and prevents the pin 38 from being displaced. The spur-wheel 39 is sufficiently long to remain in engagement with the rack in every position of the pin 38. The operation of the construction is as follows: Supposing it is desired to bring another escape-wheel into operative relation with the detents, the pin 37 is pulled out and the button or knob 40 moved longitudinally until the groove—for example, 41—corresponding with the desired escape-wheel is in the proper position, whereupon the pin 37 is again inserted.

The construction of both forms of the device described above can of course be modified in the most various ways.

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

1. The combination, with a type-writer carriage, a rack gearing therewith to effect a step-by-step forward movement for each character printed, of a plurality of diverse escapement-wheels, and means for bringing the escapement-wheels alternatively into operative engagement with the rack to modify the step-by-step units of movement to a fractional degree.

2. The combination with a type-writer carriage propelled forward step by step to a normal minimum extent for each character printed, of a plurality of diverse escape-wheels, and means for bringing the escape-wheels alternatively into operative relation to the carriage to modify the step-by-step movement to a fractional degree.

3. The combination, with a type-writer carriage propelled forward step by step to a normal extent for each character printed, of a displacement mechanism comprising a plurality of diverse escape-wheels and a single detent member, and means for bringing the escape-wheels alternatively into operative relation with the detent member to regulate the movement of the carriage.

4. The combination, with a type-writer arranged to receive interchangeable fonts of type and having its carriage propelled forward step by step to a uniform extent for all characters printed, of a plurality of diverse escape-wheels, and means for bringing the

escape-wheels alternatively into operation to modify the extent of the step-by-step movement to correspond to different fonts of type.

5 5. The combination, with a type-writer carriage propelled forward step by step to a normal extent for each character printed, of a plurality of escape-wheels having different pitches, detent mechanism to fit said escape-wheels, and means for bringing said escape-
10 wheels alternatively into engagement with said detent mechanism.

6. The combination, with a type-writer carriage propelled forward step by step to a normal extent for each character printed, of
15 a plurality of escape-wheels having different pitch, detent mechanism, means for moving said escape-wheels to bring one of the same into operative relation with the detent mechanism and the carriage, and means for trip-
20 ping the detent mechanism.

7. A feeding device for the carriage of a type-writing machine, comprising in combination, several escape-wheels having different pitches, a frame adapted to be rotated
25 and carrying said escape-wheels concentric to its axis, means to secure said frame in the desired position, detents to fit said escape-wheels, and means to bring said escape-wheels into engagement with said detents.

30 8. A feeding device for the carriage of a type-writing machine, comprising in combination, several escape-wheels having different pitches, detents to fit said escape-wheels, means to bring said escape-wheels into engagement with said detents and a support to carry said detents and adapted to turn in the opposite direction to the direction of the pressure exercised by said escape-wheels.

9. The combination, with a type-writer
30 carriage, of a feed mechanism comprising a frame rotatably mounted, a plurality of diverse escape-wheels mounted on said frame concentric to its axis, detent mechanism, means for securing said frame in position
15 with one of the escape-wheels in operative relation with the detent mechanism and the carriage, and means for tripping the detent mechanism.

10. The combination, with a type-writer
30 carriage and a rack fixed thereto, of a feed mechanism comprising a frame rotatably mounted in the plane of the carriage movement, a plurality of escape-wheels mounted on the frame concentric to its axis, a spur-wheel carried by the spindle of each escape-
55 wheel in the plane of the rack, a detent carried by a support pivotally mounted, means for securing the rotatable frame in position with one of the escape-wheels in operative
60 relation with the detent and with its spur-wheel in engagement with the rack, and means for tripping the detent-support to impart a step-by-step movement to the carriage.

65 11. The combination, with a type-writer

carriage, of an escapement comprising a plurality of diverse control members alternatively connected with the carriage and a detent member comprising two detents arranged side by side and relatively movable
70 in a plane at right angles to that of the engaged control member, a swinging support for the detents operating in a plane at right angles to that of the engaged control member, and means for separating the two detents to permit the passage of a tooth of the
75 control member.

12. The combination, with a type-writer carriage, of an escapement comprising a plurality of diverse escape-wheels alternatively
80 connected with the carriage and a detent member comprising two detents arranged side by side at different heights one of the detents being movable relative to the other in a plane at right angles to that of the engaged escape-wheel, yielding means tending
85 to hold the detents together, and a swinging support for the detent members connected with the key-levers, said support operating to swing the detent members in a plane at
90 right angles to that of the engaged escape-wheel.

13. The combination, with a type-writer carriage and a rack carried thereby, of a feed mechanism comprising a frame rotatably
95 mounted in the plane of the type-writer carriage, a plurality of diverse escape-wheels carried by the frame concentric to its axis and each having upon its spindle a spur-wheel arranged in the plane of the rack, a detent member comprising two relatively movable
100 detents arranged at different heights and connected by a spring, a swinging support for the detent member operatively connected with the type-levers and arranged to be swung in a plane at right angles to the plane of the escape-wheels, and means for
105 securing the rotatable frame in position with one of the escape-wheels in operative relation to the detent member and with its spur-wheel in engagement with the rack.
110

14. The combination, with a type-writer carriage and a rack secured thereto, of a feed mechanism comprising a frame rotatably
115 mounted in the plane of the carriage, a plurality of diverse escape-wheels carried by the frame concentric to its axis and each provided with spur-wheels arranged in the plane of the rack, a detent mounted on a swinging frame operatively connected with the key-
120 levers, and means for securing the escape-wheels alternatively in operative relation to the detent and with their spur-wheels in engagement with the rack, said means comprising a spring-pressed rod coupled to the
125 rotatable frame and provided with locking members arranged to cooperate with corresponding locking members in a fixed support.

15. The combination, with a type-writer carriage and rack secured thereto, of a feed
130

mechanism comprising a frame rotatably mounted in the plane of the carriage, a plurality of escape-wheels mounted on the frame concentric to its axis and each provided with
5 a spur-wheel arranged in the plane of the rack, a detent mounted upon a swinging support operatively connected with type-levers, and means for securing the escape-wheels alternately in operative relation with the de-
10 tent members and with the respective gear-wheel in engagement with the rack, said means comprising a spring-pressed rod pro-

vided with a plate carrying pins adapted to engage corresponding recesses in a fixed support and other spring-pressed pins engaging
15 the corresponding recesses in the rotatable frame.

In witness whereof I have hereunto signed my name, this 28th day of March, 1906, in the presence of two subscribing witnesses.

FRANZ SCHÜLER.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.