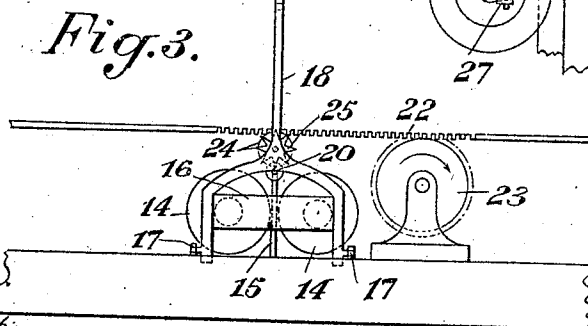
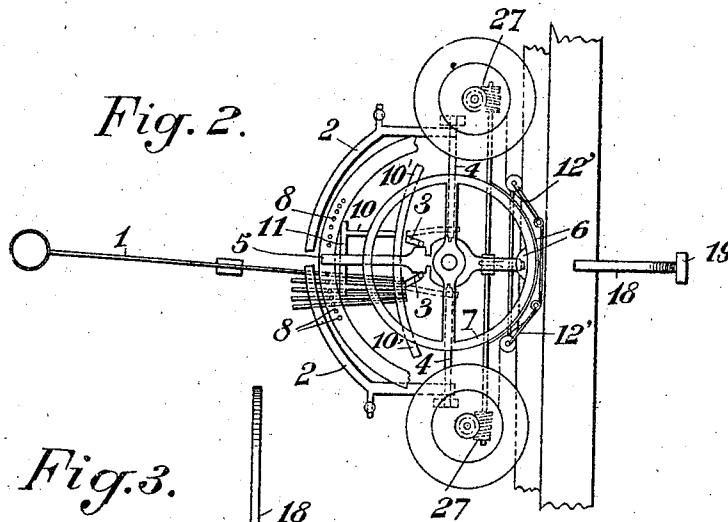
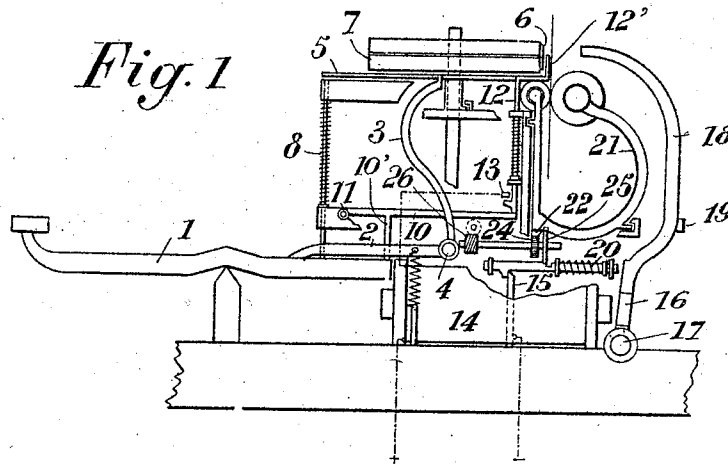


J. DUIVEN.
TYPE WRITER WITH ELECTROMAGNETIC THRUST.
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1,142,151.

Patented June 8, 1915.



Witnesses:
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JACOB DUIVEN, OF LUGANO, SWITZERLAND.

TYPE-WRITER WITH ELECTROMAGNETIC THRUST.

1,142,151.

Specification of Letters Patent.

Patented June 8, 1915.

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To all whom it may concern:

Be it known that I, JACOB DUIVEN, a citizen of the Swiss Confederacy, and resident of Lugano, Switzerland, have invented certain new and useful Improvements in Type-Writers with Electromagnetic Thrust, of which the following is a specification.

One knows already typewriters with type-segment or type-wheel and printing hammer in which the rear end of the key lever moved at any particular moment, by raising the corresponding adjusting pin, prepares the closing of the circuit of the printing hammer mechanism which closing then takes place definitely when the braking arm provided on the type segment comes into contact with the adjusting pin whereby the printing hammer is thrown by means of the printing magnet against the type which is in its printing position, the print of the type being made on the paper positioned between the type and the printing hammer. In these typewriters, however, a separate pressing of a key is necessary for each printing of the type, in other words one type cannot by one single lowering of the key be printed several times in succession on the paper. This particular circumstance has for its immediate consequence not only a great loss of time during the typewriting, but also a greater wear and tear of the parts of the typewriter.

By the present invention the above described drawback is entirely eliminated by the typewriter being provided with a make and break device influenced by the printing hammer which allows the type occupying its printing position to print several times on the paper while the key is pressed down only once.

The accompanying drawing given by way of example, shows one form of embodiment of the invention applied to a Hammond typewriter.

In this drawing: Figure 1 shows a side elevation view; Fig. 2 the top plan view and Fig. 3 a rear elevation view of the most important parts.

The adjusting pins 8 rest upon the front ends of the keys 1 which extend toward the axis of the braking arm and type guide lever 5. Resting on the same ends of the key levers 1 are the horizontal arms 2 of the levers 3 which latter are mounted to revolve on the axis 4. When one of the keys 1 is pressed down, the corresponding arm 2 of one of the levers 3 is moved upward while

revolving around the axis 4, whereby the corresponding lever 3 is pressed toward the rear and actuates the braking arm and type guide lever 5, one of the arms of which moves the type shuttle 6 in a ring 7 until the corresponding letter has arrived at the place of printing.

Mounted in the framework of the typewriter is a lever 10 fulcrumed at 11 and the horizontal arm 10' of which rests upon the rear ends of the key levers 1. Above the rear end of lever 10 there is a rod 12 which is moved by a spring and is adapted to move in a vertical direction. The rod 12 carries the ribbon 12' at its upper end. This lever 12 can be raised until it strikes against an abutment 13 thus closing the circuit. When the rod 12 is lifted, the ribbon is also raised between the type and the paper.

Positioned immediately under the typewriter is an electro-magnet 14 which is in the circuit with a battery. This circuit also contains the abutment 13 as well as another abutment 15 positioned between the coils of the electro-magnet 14. The other parts of the typewriter are metallically connected between each other. The armature 16 of the electromagnet 14 is made integral with the vertical printing hammer 18 which is movable around the axis 17 and in its position of rest bears against an abutment 19. Arranged between the electro-magnet 14 and the carriage 21 of the typewriter is a make and break device 20 which is controlled by a spring having the tendency to keep the make and break device constantly in contact with the abutment 15.

The carriage 21 carries on its lower side a toothed rack 22 which coöperates with a spring drum 23, (Fig. 3) and said drum tends to move the small toothed wheel 24 with which it engages. Mounted on the shaft of the toothed wheel 24 is an escapement wheel 25 the teeth of which bear against the make and break device 20 near a notch provided in the latter. The arrangement of the escapement wheel 25 with reference to the make and break device 20 is such that when the make and break device is moved back after a type has been printed, one tooth of the escapement wheel slips through the notch thus shifting the paper carriage the width of one letter. Mounted at the end of the shaft of the escapement wheel is a driving mechanism 26 which transmits movement by means of the shaft

27 to the ribbon shifting device so that each shifting of the paper carriage produces a shifting of the ribbon.

The function of this typewriter is as follows: When a key 1 is pressed down, the lever 3, the corresponding lever 5 and the braking pin 8 adjust the type-carrier or type-segment in such a way that the required type is brought in front of the place of printing. At the same time the lever 10 causes the rod 12 to rise which also brings the ribbon within reach and in front of the types while the abutment of the rod 12 touches the abutment 13 thus closing the circuit. This causes the electro-magnet 14 to be energized which attracts the armature 16 and thus also causes the printing hammer 18 to be thrown against the type thereby printing the letter on the paper. When the armature 16 of the electromagnet has approached the latter about half-way *i. e.* when the printing hammer has covered about half the distance from the printing point, it strikes against the make and break device 20 which latter is then carried along until the hammer strikes the paper. Through this shifting of the make and break device 20 the shoulder thereof recedes from the abutment 15 and the circuit is interrupted at this place so that the armature and the printing hammer 18, after having performed its stroke *i. e.* after the printing of the required letter, again falls back into its position of rest. This backward movement is further assisted by the spring of the make and break device. When the make and break device goes back into its original position, the escapement wheel 25 advances in the notch one tooth, thus shifting the carriage 21 through the medium of the toothed wheel 24 and the toothed rack 22 a distance equal to the width of one letter while at the same time the ribbon is advanced a little through the medium of the mechanism 26-27. Now, when the key is again released, the required letter has been definitely printed on the paper and all the parts again assume their normal position of rest. When however the key in question is kept lowered a considerable length of time the electro-magnet, owing to the contact between the rod 12 and the abutment 13 remaining closed, is energized repeatedly and the print-

ing hammer 18 is thus repeatedly thrown against the same type whereby the same letter or sign is printed by the side of the preceding one. As readily seen, a letter or sign can thus be printed on the paper several times side by side by means of a single pressing down of the key.

Having now fully described my said invention, what I claim and desire to secure by Letters Patent, is:

1. In a typewriter the combination with the keyboard, the type shuttle, the carriage, the printing hammer, and the ribbon, of mechanical means for adjusting the type shuttle from the keys, electro-magnetic means actuated from the keys and adapted to actuate the hammer, means for advancing the said carriage and the ribbon at each actuation of the hammer and an automatic make and break device adapted to cause the said electro-magnetic means to repeatedly actuate the said hammer when the keys are pressed down for a longer period, substantially as and for the purpose set forth.

2. In a typewriter of the kind described, the combination with the type-shuttle, the carriage, the hammer, the ribbon mechanism, and the key mechanism adapted to adjust the said type shuttle, of a printing hammer, an electro-magnet, an armature made integral with said printing hammer and adapted to be actuated by said electro-magnet, a contact inserted in the circuit of said electro-magnet, means for closing the said contact at each pressing down of any of the keys, a second contact inserted into the circuit of said electro-magnet and spring controlled means adapted to be actuated by the said hammer during its printing stroke so as to open the said contact and to close the said contact when the hammer returns into its position of rest and means adapted to be actuated by the means for actuating the said second contact and to cause the said ribbon to advance, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

JACOB DUIVEN.

Witnesses:

COAN GOREUMLO,
A. VAN DOBBEN.