

No. 647,271.

Patented Apr. 10, 1900.

F. MAYER.
TYPE WRITING MACHINE.

(No Model.)

(Application filed Jan. 21, 1898.)

4 Sheets—Sheet 2.

Fig. 2.

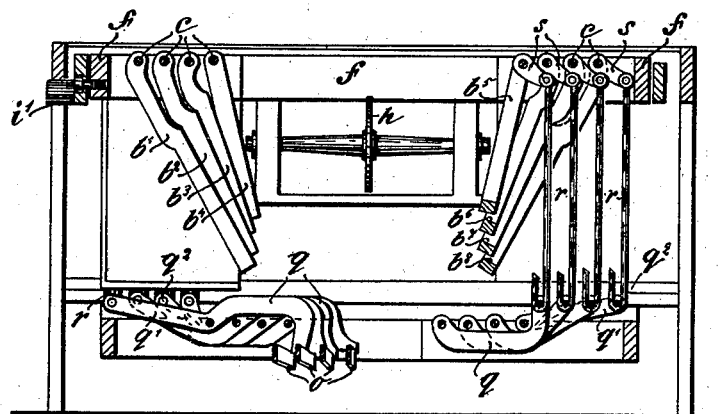


Fig. 4.

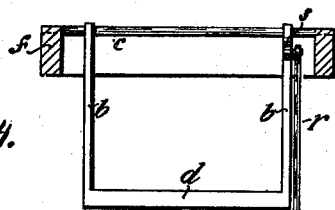


Fig. 6.

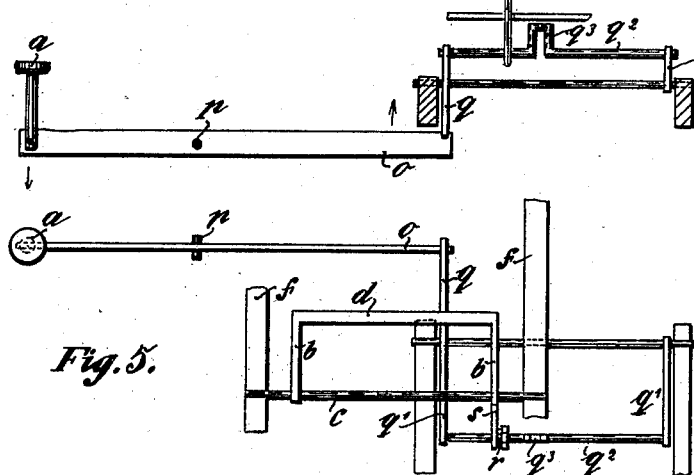
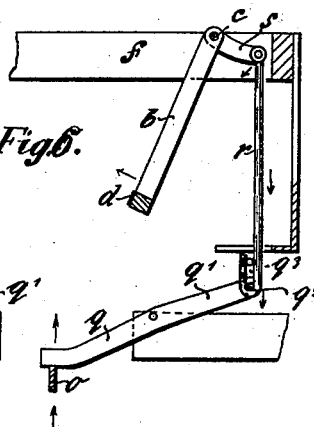


Fig. 5.

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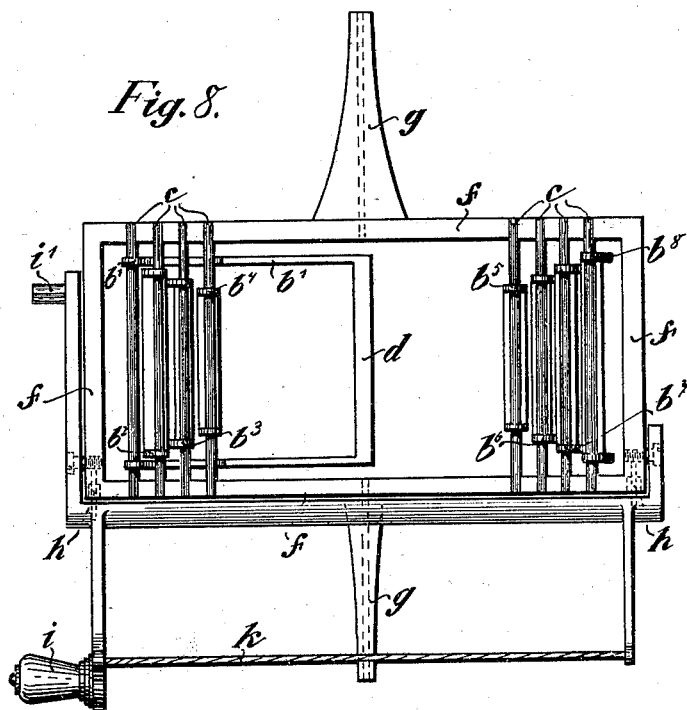
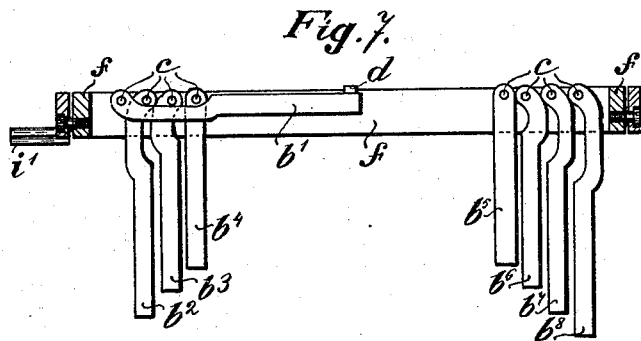
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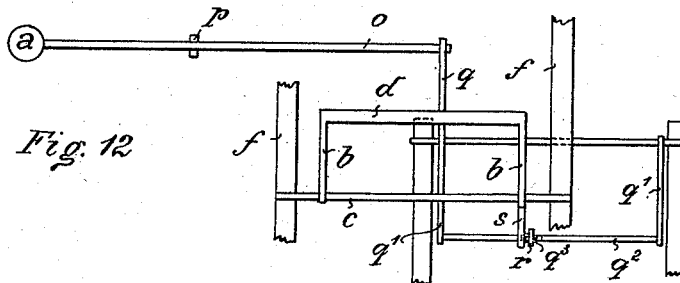
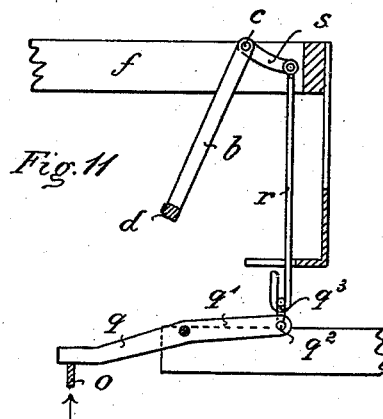
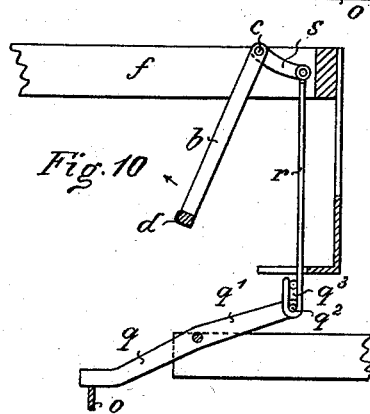
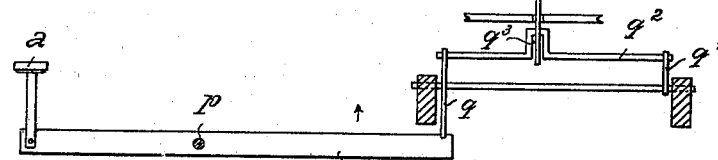
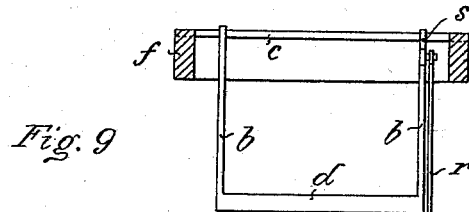
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

FRITZ MAYER, OF ZURICH, SWITZERLAND.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 647,271, dated April 10, 1900.

Application filed January 21, 1898. Serial No. 667,447. (No model.)

To all whom it may concern:

Be it known that I, FRITZ MAYER, civil engineer, a subject of the King of Prussia, German Emperor, residing at No. 170 Seefeldstrasse, Zurich, Switzerland, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full and exact specification.

This invention relates to a type-writing machine in which the number of the keys is greatly reduced and in which there are no special shifting-keys for moving the carriage with the type-carrying frames. I attain this object by arranging the types in groups and in a convenient manner upon oscillatory frames, each of which may be operated by a special key, so that consequently the number of the keys is restricted to the number of said type-carrying frames, and, further, to completely avoid shifting-keys I suspend the oscillatory type-carrying frames in a common carriage that may be displaced in the longitudinal direction of the machine, the displacement (for the purpose of adjusting a distinct type of a type group) being effected by means of a handle which at the same time indicates upon an index-plate that type of any of the type groups which has just been adjusted for print. There are consequently no shifting-keys required irrespective of how many types there may be contained in one or the other group. This object—*i. e.*, the possibility of letting each group of types have any desired number of types and of being thus able to restrict at will the number of the printing-keys without the employment of a corresponding number of shifting-keys—is attained by making the movement of the type-carriage completely independent of the key-levers in the position of rest of the same, the special means therefor consisting in axles that extend in the direction of movement of the type-carriage and serve for transmitting the movement from the key-levers to the type-carrying frames. The connecting-rods between the type-carrying frames and the aforementioned axles may glide along said axles when these latter are in their position of rest, the lateral movement of said rods being thereby not in the least impeded. By providing such an axle with a crooked part the effect

may be attained that the type-carrying frame belonging to or operated by the mediation of that axle is not operated when the crooked part of the axle is just in line with the said rod. There is thus in such a case no impression produced, and as by the downward movement of the keys also the lateral displacement of the paper-slide is effected in known manner—*i. e.*, for such a distance as corresponds to the average breadth of a letter—the spacing may thus be effected by the means just mentioned or without the use of a special spacing-key, respectively. There are, it is true, type-writing machines with keys in which two, or at most three, types are carried by a common oscillatory type-lever. In such cases, however, the selection of the types to be carried by the common levers cannot be made at will, because, for instance, every capital letter and the corresponding small letter must be placed side by side, so that when making use of the shifting-key the proper survey over all the keys is not impaired, as is, for instance, the case in the well-known Remington type-writing machine. The manufacturer is therefore not in a position to arrange the signs upon the index-plate or upon the keys, respectively, in any convenient manner, and he is, further, not in a position to pay due respect to the frequency of the different letters as they occur in the different words. If there are three types or even more arranged upon a common lever, then there are at once requisite two or even more shifting-keys, which, however, render the writing difficult, since an incorrect impression may be produced even if the correct printing-key has been employed. Such result occurs at once if a wrong shifting-key is employed or if the right shifting-key is employed at a wrong time. Furthermore, the number of types upon a common type-lever is in the machines just spoken of limited to two or at most three, because the manner of transmitting the movement from the key-levers to the type-levers allows only of a very limited displacement of the carriage.

My improvements in type-writing machines of the kind referred to above relate to some arrangements and combinations of parts, as are fully described hereinafter, and in order

to make my invention more clear I refer to the accompanying drawings, in which similar letters denote similar parts throughout the several views, and in which—

5 Figure 1 is a vertical longitudinal section through my improved machine, the section being taken in line *xy* of Fig. 3. Fig. 2 is a vertical cross-section in line *wz* of Fig. 3. Fig. 3 is a plan of the machine, some parts being broken away. Fig. 4 is a side view of a key-
10 lever, a type-carrying frame, and the means for transmitting the movement of the former to the latter. Fig. 5 is a plan of the parts shown in Fig. 4, and Fig. 6 is a rear view of
15 said parts. Fig. 7 is a front view of the carriage with all the type-carrying frames. Fig. 8 is a plan of said carriage combined with the means for displacing it in the longitudinal direction of the machine. Fig. 9 is a
20 view similar to Fig. 4, showing the type-carrying frame in another relative position with regard to the means for transmitting the movement of the key-lever to said frame. Fig. 10 is a view similar to Fig. 6, showing
25 also the other relative position aforementioned and being a side view of Fig. 9. Fig. 11 shows the lower parts of Fig. 10 in another position, the lever-arm *q'* being depressed; and Fig. 12 is a view similar to Fig. 5, showing
30 also the other position mentioned at Figs. 9 and 10.

In the form of construction of the machine as represented in the aforementioned figures there is only one row of keys, consisting of
35 eight such ones, and there are consequently also eight groups of types in the machine. Each of said groups is arranged upon the middle part *d* of a rectangular type-frame *b*; Figs. 4, 5, and 6, which is suspended from or
40 may turn upon an axle *c*.

Of the eight type-frames *b* four (*b'* to *b⁴*) are located upon the left side of the machine and four (*b⁵* to *b⁸*) upon the right side of the same. The sizes of said frames are different,
45 and the arrangement of them with regard to each other is such that the adjusted type is always thrown against the same point of the paper-roll irrespective of the type-carrying frame which the respective type is contained
50 upon. The upward movement of each of the type-carrying frames is effected by a pressure upon the respective key *a*, which then causes the respective frame *b* (*b'* to *b⁸*) to swing upward upon its axle *c*.

55 There is of course only one point of impression for every type-frame and every type, because the carriage *f* is provided with horizontal extensions *g*, that are supported by rollers *h*, and there are, further, lateral guide-
60 pieces, so that the carriage may be displaced to and fro in the longitudinal direction of the machine. The type-frames *b* may thus be so adjusted by the suitable displacement of the carriage that just the desired type may be
65 thrown against the common place of impression upon the paper-roll or upon the paper, respectively.

The displacement of the carriage is effected by means of a handle *i*, which at the same time indicates upon the index-plate *l*, by
70 means of a wire *k*, which type of any of the type groups may be imprinted in that respective position of the carriage if one or the other of the keys (each of which belongs to a distinct group of types) is depressed.
75

It may be mentioned at this place that there is in one group of types a place not occupied by a type, such latter being replaced by a circle or other sign. This sign serves for indicating the places where spacings between
80 words may be effected by the respective key, as will be more fully described hereinafter.

In order to obtain quite an exact adjustment of the carriage with its type-frames or of the wire *k* upon the index-plate *l*, respectively, the handle *i*, or, more precisely, the bar which the handle proper is secured to, is provided with a projection or tooth *i'*, that may take into the recess between two teeth of a stationary rack *i²*, fixed to the frame of
85 the machine. (See Figs. 1, 3, 7, and 8.) There are of course so many teeth upon said rack that the proper adjustment may be effected for each position of the wire *k*. By depressing one or the other of the keys *a* a lever *o*,
90 located in the lower part of the frame, is turned upon its fulcrum *p*, Figs. 1, 4, 5, and 6, in such a direction that its rear end moves upward and acts thereby against the lower arm of a double-armed inclined lever *q q'*, Figs.
95 5 and 6, the arm *q'* of which carries a horizontal axle *q²*. There are preferably two such arms as *q'*, each at one end of said axle. The path of the axle in its upward and downward movement is thus a part of a circle, the line
100 between the fulcrums of the arms *q'* being the center line. The axle in question is loosely connected with a vertical bar *r*, hinged at its upper end to a lever *s*, connected with a respective type-frame *b*, (*b'* to *b⁸*.) Each down-
105 ward movement of the axle *q²* causes an upward movement of the type-frame *b* irrespective of whether the lower hook-like end of the rod *r* is in connection with one or the other end of the axle *q²*. Each of the rods *r* glides
110 along its respective axle *q²* when the carriage *f*, with the type-frame *b* and the rods *r*, is displaced in the longitudinal direction of the machine. Thus by operating a key the respective type-frame *b*, with the group of types con-
115 tained thereon, is thrown upward against the paper; but only one of said types is imprinted, according to the adjustment of the carriage or of the wire *k* upon the index-plate *l*, respectively. Further, by depressing one or the
120 other of the keys there is at the same time operated a mechanism which causes the displacement of the paper-roll *e*, with its supporting parts, in its axial direction. Mechanisms of this kind are fully known to every
125 expert, and I have therefore dispensed with showing and describing the same.

I limit myself to remarking that the paper-roll *e* is carried by a horizontal frame adapted

to rock upon and to move along a horizontal axle located behind the paper-roll. (See Fig. 1.)

One of the axles q^2 may have an upwardly-
5 extending crooked part q^3 , Figs. 4, 5, and 6, which, when lying in line with the corresponding rod r after this has been sufficiently displaced by or together with the carriage f , (see Fig. 9,) does not draw this rod downward
10 when that corresponding key a is depressed. (See Fig. 11.) In other words, a depression of that key, which is the key the group of types of which contains the circle or other sign indicating the place of spacing, does not
15 cause in that case the impression of a letter; whereas, however, the paper-slide is displaced. There may be thus produced by this means the spacing between two words without the employment of a special spacing-key. If an
20 uneven number of type groups is contained in the machine, then one type-frame b , which in this case consists of an oscillating bar, is suspended in the middle of one of the lateral parts of the carriage in such a manner that
25 the types of its group may also arrive one after the other in proper printing position when the displacement of the carriage is effected. The other type-frames are distributed symmetrically upon the right and left part of the
30 machine.

Suppose the letter "K" shall be imprinted. Then the carriage is first adjusted by means of the handle i in such a manner that the wire k is situated upon the index-plate l just
35 below that row of types extending from right to left which the type "K" belongs to. It may be remarked at this place that each type of a group of types belongs to a row of types that extends from the left side to the right side of the machine. Each group of types,
40 however, extends in the direction from the front to the rear of the machine and the types in each such group correspond exactly to the types upon the separate type-frames. By the adjustment aforementioned the carriage f ,
45 with the several type-frames b , has been displaced below the paper-roll e in the position which corresponds to the types of the separate frames as they are indicated by the wire k upon the index-plate l . If now the key a'
50 is depressed, then the parts o , q , q' , r , and s are so operated as to throw the type-frame b' upward around its axle c , so that consequently the letter "K" contained in the group
55 of types is imprinted. If thereafter the key is freed from the pressure, the frame b' swings down into its former position under its own weight and also the other parts reassume their former positions. There may of course
60 be springs employed if the weight of the type-

frames should not be sufficient to effect the backward movement of the parts connected with said frames.

Having now fully described the nature of my invention, what I desire to secure by Letters Patent of the United States is—

1. In a type-writing machine having a carriage adapted to be displaced in the longitudinal direction of the machine, oscillatory frames suspended from said carriage, and
70 types attached in groups to said frames, the combination with the said carriage, of a handle attached to the latter, an index-plate, and an indicator attached to said handle and adapted to be adjusted over and upon said
75 index-plate by the said handle and together with the carriage, substantially and for the purpose as described.

2. In a type-writing machine having a carriage adapted to be displaced in the longitudinal direction of the machine, oscillatory frames suspended from said carriage, and
80 types attached in groups to said frames, the combination with the said carriage, of a handle attached to the latter, an index-plate, and
85 an indicator attached to said handle and adapted to be adjusted over and upon said index-plate by the said handle and together with the carriage; vertical rods suspended
90 from the said frames, horizontal axles located below the carriage and the frames, and coupled with said rods so as to allow of the displacement of same along said axles, and
95 means for moving the latter, substantially and for the purpose as described.

3. In a type-writing machine having a carriage adapted to be displaced in the longitudinal direction of the machine, oscillatory frames suspended from said carriage, and
100 types attached in groups to said frames, the combination with the said carriage, of a handle attached to the latter, an index-plate, and an indicator attached to said handle and adapted to be adjusted over and upon said
105 index-plate by the said handle and together with the carriage; vertical rods suspended from the said frames, horizontal axles located below the carriage and the frames, and coupled with said rods so as to allow of the displacement of same along said axles, and
110 means for moving the latter, one of the said axles having a crooked part bent upward, substantially and for the purpose as described.

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

FRITZ MAYER.

Witnesses:

ALBERT KOCH,
A. M. LIEBERKNECHT.