L. TIOLI.

SYLLABIC TYPE WRITER.

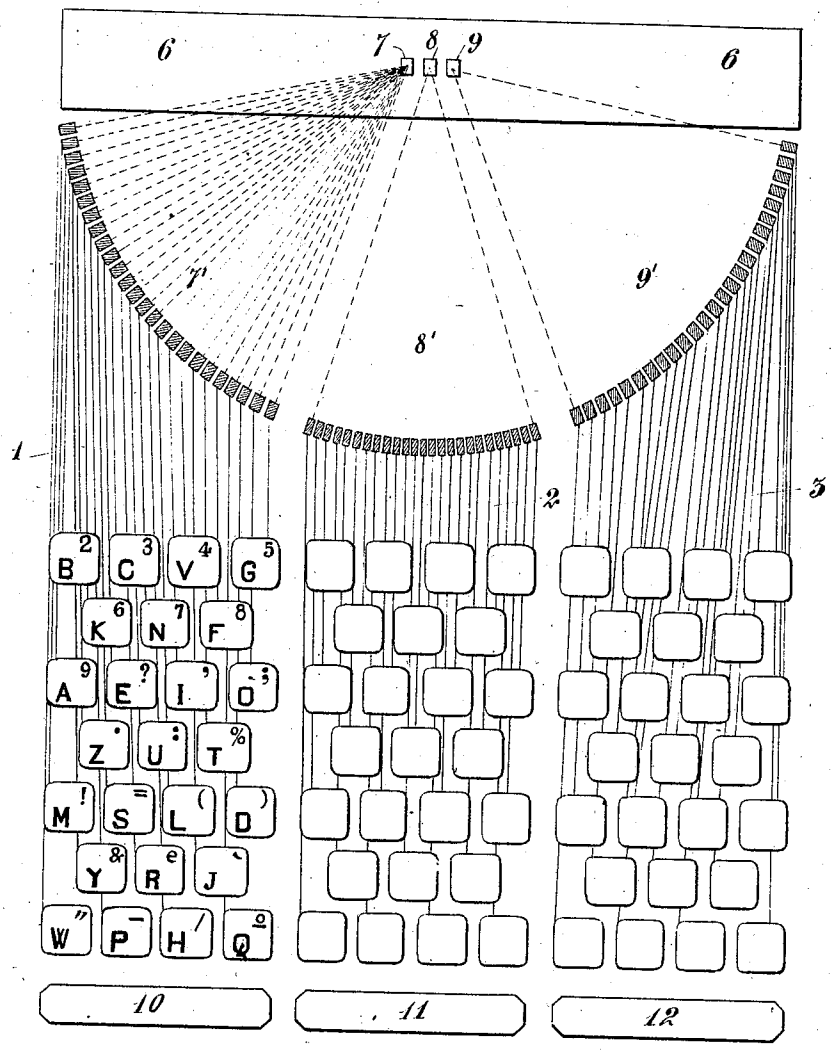
APPLICATION FILED JAN. 4, 1917.

1,287,521.

Patented Dec. 10, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



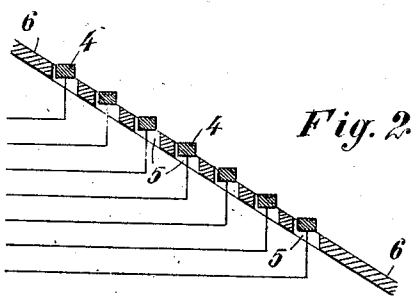


Fig. 2.

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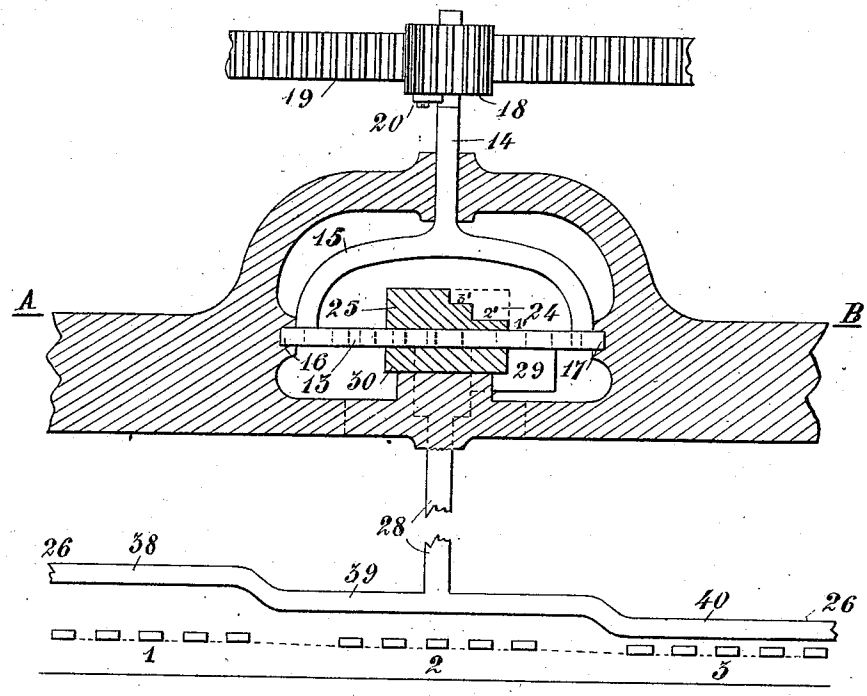
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2 SHEETS—SHEET 2.

Fig. 3.



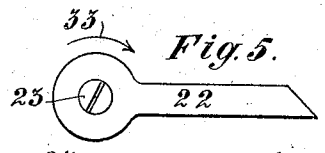


Fig. 5.

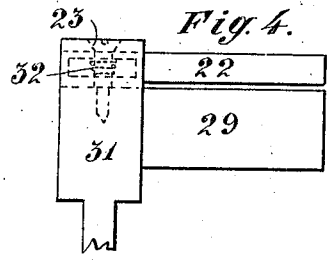


Fig. 4.

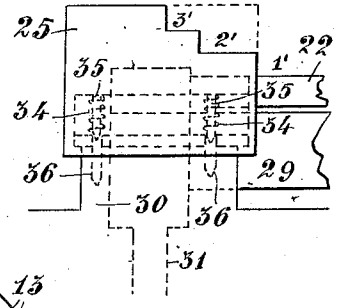
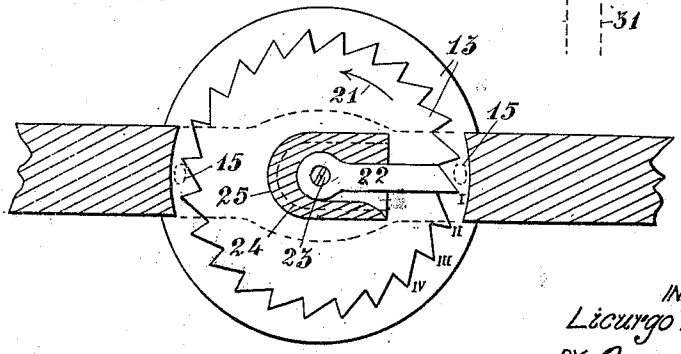


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

LICURGO TIOLI, OF ROME, ITALY.

SYLLABIC TYPE-WRITER.

1,287,521. Specification of Letters Patent. Patented Dec. 10, 1918.

Application filed January 4, 1917. Serial No. 140,583.

To all whom it may concern:

Be it known that I, LICURGO TIOLI, physician, a subject of the King of Italy, residing in the city of Rome, in the Kingdom of Italy, have invented certain new and useful Improvements in Syllabic Type-Writers, of which the following is a complete and full description.

The present invention refers to those typewriters which are generally known as "syllabic typewriters" and which permit of contemporaneously printing several letters. One of the objects of the invention is to provide a typewriter of said class which will permit of printing at a stroke two, three, or even more letters or signs, arranged in any way whatever, without preventing the use of the single keys in the same manner as in the ordinary typewriters, viz: for printing a letter, or sign, at each stroke, this new typewriter being arranged in such a manner that the shifting of the carriage is automatically controlled in accordance with the number of spaces necessary for printing the group of signs lowered together.

The contrivances of the present invention as hereinafter particularly described, are illustrated in the annexed drawings in which;

Figure 1 shows a top view of the keyboard;

Fig. 2 a longitudinal section of the same;

Figs. 2 to 7 show on an enlarged scale the details of the contrivances of the typewriter and more especially;

Fig. 3 shows an elevation of the shifting wheel for the carriage;

Fig. 4 shows an elevation of a tooth controlling the shifting gear together with the driving gudgeon of the same;

Fig. 5 shows a top view of the said tooth taken alone;

Fig. 6 shows a lateral elevation of the regulating block of the said tooth;

Fig. 7 shows a horizontal section, on the line A B of the Fig. 3, the bridge standing above the aforesaid wheel being omitted.

The figures are intended to be more or less diagrammatic illustrations of the various parts, the size of which, especially of those of the keyboard can be altered at will, provided that such alterations be consistent with the performance of the fingers of the typist.

The above mentioned improvements comprise: a special keyboard with keys arranged in groups; a new shifting gear for the carriage moving the same for a variable number of spaces from the right to the left, and a special arrangement and construction of key levers for each group of the keyboard.

This typewriter embodying the contrivances, which form the object of the present invention, can be built of the same shape and size as the usual typewriters, by conveniently arranging the keys and the levers in such a way that they will be more compactly disposed than in the usual typewriters. It will be convenient to give this new machine the same width as the usual typewriters so as to enable the typist to act contemporaneously with one hand at least on two groups of keys, as will be explained hereinafter.

The keyboard comprises a number of groups of keys. In Fig. 1 are shown three equal groups, but, evidently, the number of the groups, as well as the number of the keys contained in each group, can be altered according to the circumstances.

The groups of keys instead of being developed in width are developed in depth. Each group, in the example shown (Fig. 1), consists of alternated rows of three and four keys, and the number of the rows is determined by the number of the signs to be printed. In Fig. 1, are shown groups with seven rows, but this arrangement although convenient, need not be necessarily adhered to in all cases.

When the keys —4— (Fig. 2) are lowered they enter the recesses —5— provided for them in the inclined plate —6— below them.

This is a convenient arrangement, as the fingers of the typist during the writing need not pass between the keys. The first group of keys comprises, besides the letters, also the ciphers and other conventional signs. In this way by means of an ordinary shift key, as already used in some typewriters, for raising the carriage to the first height, the capital letters can be obtained and by raising the same to the second height, the signs, while the position of the carriage remains normal for the small letters.

The printing bars of the first group instead of bearing only two rows of letters, bear also a third row containing the signs. This arrangement of the double elevation of the carriage as used in some old system of typewriters, has been abandoned in nearly

all the new systems and has been substituted by an addition of keys in order to save time. With this new typewriter however, the old arrangement can be conveniently maintained because the loss of time becomes absolutely insignificant in view of the special means adopted in it for speeding the work.

The arrangement of the letters on the keys as shown in Fig. 1 need not be strictly adhered to, but it is advisable to maintain the vowels as shown in the drawing, as experience has proved that the position thereof is one of the most convenient and advantageous for the different combinations of letters which may be met with in writing.

With this typewriter the three groups of keys which are similar, can be operated independently and each one is sufficient to write correctly just as if each of them formed a complete keyboard of an ordinary typewriter, with the only difference that when writing by means of the second or the third group separately, the interval of the letters will be of two or three spaces instead of one, which might in some cases be a desirable feature, as for instance when a certain word or sentence is to be written without the use of brackets or other signs.

It is to be noted that all the printing bars —7′— of the first group (Fig. 1) strike in the point marked with the reference numeral —7— in the drawing; those —8′— of the second group in the point —8— and those —9′— in the point —9—.

The distance between the points —7—, —8—, and —9— may be made to be the same as the interval between the letters in an ordinary typewriter. In this way by depressing a key of the first group, another of the second group and one of the third group, at the same time, three letters in a line, at equal intervals, are printed at a stroke, that is to say there is always the possibility of obtaining phonetic groups of three letters with three synchronous strokes of the keys.

In the same way by depressing a key of the first group and a key of the second group at the same time, a group of two letters is obtained. By acting on the first group of keys alone and leaving the other two groups inoperative, there also remains the possibility of striking one key at a time, the same as with the ordinary typewriter.

To this end a special system of escapement which will be fully described hereinafter, has been provided for.

It will also be noted that three groups of keys are provided with corresponding space keys —10—, —11—, —12— connected in such a way with the respective groups, that they are operated whenever a key is lowered. When the space key —10— of the first group is lowered the carriage advances one space, with the space key —11— of the second group the carriage advances two spaces, and with the space key —12— of the third group the carriage advances three spaces. As will be seen this arrangement presents enormous practical advantages.

As has been explained before the space keys are moved by depressing the printing keys, but they can be also operated independently of said keys as in the ordinary typewriters.

Hereafter is given a practical example of the many advantages obtained by the use of this new typewriter.

For instance, wishing to write the words: "your idea" this new kind of typewriter permits of writing them in the following manner: "you r—i dea" whereby the letters "you" are printed by means of the three groups operated together and the same is true of the letters "dea", while the letters "r—i" are printed by means of the first and the third group and the space between the two words ensues by reason of the use of the third group while the second group has remained inoperative, and no space key needs to be operated.

Furthermore, wishing to write the words "she is" the three groups are used for the word "she" and for the word "is" the second and third groups are used without operating the space key.

In order to obtain the utmost economy of time with this new typewriter, the central group and the group to the right are for the contemporaneous action of the fingers of the right hand while the fingers of the left hand act on the keys of the first group and on the key controlling the carriage height.

Hereafter is described the escapement by means which all the above operations are actually performed.

This new system of escapement consists of a single wheel, by means of which it is possible, by lowering a key of one or the other of the groups, to cause the advancement of the carriage by one or more spaces. As shown in the drawing the number of these spaces is limited to three, and it has been found by experience that this number of spaces is the most convenient and therefore to be preferred, but nothing prevents the adoption of only two spaces, or an increase to four spaces, without substantially altering the action of the escapement.

The mechanism consists essentially of a toothed wheel —13— (Figs. 3 to 7) which is rigidly connected with the shaft —14— by means of a clip —15— and runs in guides —16— and —17—, (Fig. 3). As shown in Fig. 7 this wheel is toothed inside, and some of the teeth are indicated therein with I, II, III, and IV, the tooth I is at the initial position of rest of the regulating tooth of the escapement which will be described hereafter, while the other three teeth are at the

positions which the same tooth can take in accordance with the three performances of the typewriter.

The shaft —14— connected rigidly with the wheel —13— carries at its end a pinion 18, which gears with the rack bar —19—. Said pinion is connected with the shaft —14— by a pawl —20— which turns the shaft when the rack bar moves from the right to the left, in which case also the wheel —13— is compelled to turn in the same direction as the pinion.

When the carriage is pushed back to its initial position in order to begin to write a line, the pawl —20— moves automatically out of gear and the pinion —18— turns without imparting movement to the shaft —14— and consequently the wheel —13— remains stationary. When the rack bar moves from the right to the left through the pulling of the spring, the wheel —13— moves with the pinion and would therefore turn freely in the direction indicated by the arrow —21—, if it were not prevented by the movable tooth —22—, (Fig. 7) which belongs to the escapement device and is stopped in its course around the pivot —23— (Fig. 5) by the box —25— having a U shaped recess within which the tooth —22— works. The tooth —22— and a fixed tooth —29— are carried by an elevating member —31— connected with the shaft —28—. The box —25— with a support —30— form another system which will be described hereafter. When the typewriter is at rest, the toothed wheel —13— is locked and consequently also the pinion —18— and the rack bar —19—.

In operation, if for instance, one of the keys belonging to the group —I— (Fig. 3) be lowered thus raising with its lever the portion —38— of the universal bar —26— provided with three steps —38—, —39—, —40—, the elevation member —31— will be raised to a certain height by means of the bar —28— connected with the bar —26—. The said member —31— thus moves in the box —25— to such a height as is necessary to raise the movable tooth —22— out of the space in which it was kept locked between the two teeth I and II of the wheel —13—, its place being then taken by the fixed tooth —29— placed therebelow. It then happens that the wheel —13— remains still locked by the fixed tooth —29— while the free movable tooth —22— will follow the impulse received from the spring —32— (Fig. 4) and tends to move in the direction indicated by the arrow —33— and will move till it is stopped by the first of the three steps —1'— —2'— —3'— of the U shaped box —25— that is the step —1'— (Fig. 6). By releasing the key the tooth —22— will go down as much as it had been raised, pulling with it the upper part of the box —25—. The tooth —22— will be ready to engage in the next space between two teeth of the toothed wheel, that is in the space —II—, while the fixed tooth —29— moves free of the wheel —13— which will now, yielding to the pull of the spring of the rack bar, be able to turn in the direction indicated by the arrow —21—, until the movable tooth —22— is again stopped by the stop —24— of the box.

The whole system will now return to its original position of rest but the rack bar will be displaced from the right to the left to such an extent as to allow the carriage to advance a distance equal to the spaces occupied by the printed letters.

It is necessary now to explain particularly how it happens that the movable tooth in going down drags behind the upper part of the box —25—. As shown in Fig. 6 the box —25— which surrounds the teeth —22— and —29— can move vertically on the lower part —30— of the same, against the tension of two springs —34— coiled around the posts —35—, pushing these posts into the opposite holes —36— drilled in —30—. When the movable tooth —22— releases the box —25—, the latter returns in its former position by means of the aforesaid springs.

Supposing now that one of the keys of the group —2— is lowered, its lever, which has the same course as that of the first group of keys, meeting on its way the universal bar —26— in its part —39— will raise same for a double length thus bringing the whole running system in the U-shaped box —29— to a double height, so that the movable tooth —22— will be stopped by the step —2'— of the box and the tooth is thus ready to engage the space —III— of the wheel —13—. The same happens with the third group of keys, for which the movable tooth —22— (the running system in the box —25— being raised to the third height) will engage in the space —IV— of the wheel —13—. Thus in the same way described before, a displacement of the carriage by two or three spaces can be obtained.

In a few words this new invention consists in a mechanical arrangement as described, which permits of writing several alphabetic letters at the same time in a line on the paper with the usual intervals between the letters and the words of the same horizontal line, as in the case with the ordinary typewriters, but with a remarkable economy of time, the said arrangements being in whole or in part, and in several ways, applicable to the typewriters now in use and leaving to the typist the choice of using either the new system, the operation of which has been described, or the old system of writing one letter at a time.

I claim:

1. A typewriter comprising a plurality of groups of keys, a carriage, a rack bar connected to the carriage, a pinion which

engages with the rack bar, a pawl acting on said pinion, a shaft carrying the pinion, an internally toothed wheel mounted on the said shaft, a tooth on the inside of the wheel which turns about the same axis, the free end of said tooth engaging in the teeth of the said wheel, a second tooth connected with the first tooth and movable vertically with the same, but fixed on the axis, a collective spacer, with a number of steps corresponding to the number of groups of keys, which is raised to various heights by the various groups of keys, a bar connected to the said spacer arranged to raise the movable teeth within the wheel, a U-shaped and vertically movable box, in which the said teeth slide in their vertical movement, said box having legs, one of which forms a stop for the first tooth, the other leg being provided with successive notches which widen in an angular direction, so as to allow the movable tooth to turn in relation to the spacer during elevation thereof, a fixed support for the said box, and resilient means for moving the several parts to shift the carriage forward by a length depending upon the extent of vertical movement of said spacer.

2. In a typewriter of the character described, an internally toothed wheel, means for operating the wheel from the carriage, a stepped and recessed member, a member vertically movable and provided with a fixed and a movable tooth for alternately engaging the toothed wheel, the movable tooth being in the recess of the stepped member, and means for operating the movable member from the key bars.

3. In a typewriter of the character described an internally toothed wheel, means for operating the wheel from the carriage, a stepped and recessed member, a member vertically movable and provided with a fixed and a movable tooth for alternately engaging the toothed wheel, the movable tooth being in the recess of the stepped member, and a stepped member operated by the key bars and connected with the said vertical movable member.

4. In a typewriter, a carriage, an internally toothed wheel, means for operating the wheel from the carriage, a stepped and recessed member, a vertically movable member provided with a fixed and a movable tooth for alternately engaging the toothed wheel, the movable tooth being in the recess of the stepped member, a stepped bar connected with the vertically movable member, and a plurality of groups of keys having their key bars arranged below the said stepped bar and adapted to operate the same and thereby the vertically movable member.

5. In a typewriter, of the character described, a carriage, an internally toothed wheel, means for operating the wheel from the carriage, a vertically movable member provided with a fixed tooth and a pivoted and spring actuated tooth, a stepped bar connected with the movable member for raising the same to alternately engage the fixed tooth and movable tooth with the toothed wheel, means for arresting the movement of the pivoted tooth, and a plurality of groups of keys having their key bars arranged below the stepped bar and adapted to operate the same and thereby the vertically movable members.

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

Rome, the second of December, 1916.

LICURGO TIOLI.

Witnesses:
LETTERIO LABOCCELTO,
RENATO SCEVOLA.