

936,229.

J. F. FORKARTH.
TYPE WRITING MACHINE.
APPLICATION FILED JAN. 18, 1906.

Patented Oct. 5, 1909.

3 SHEETS—SHEET 1.

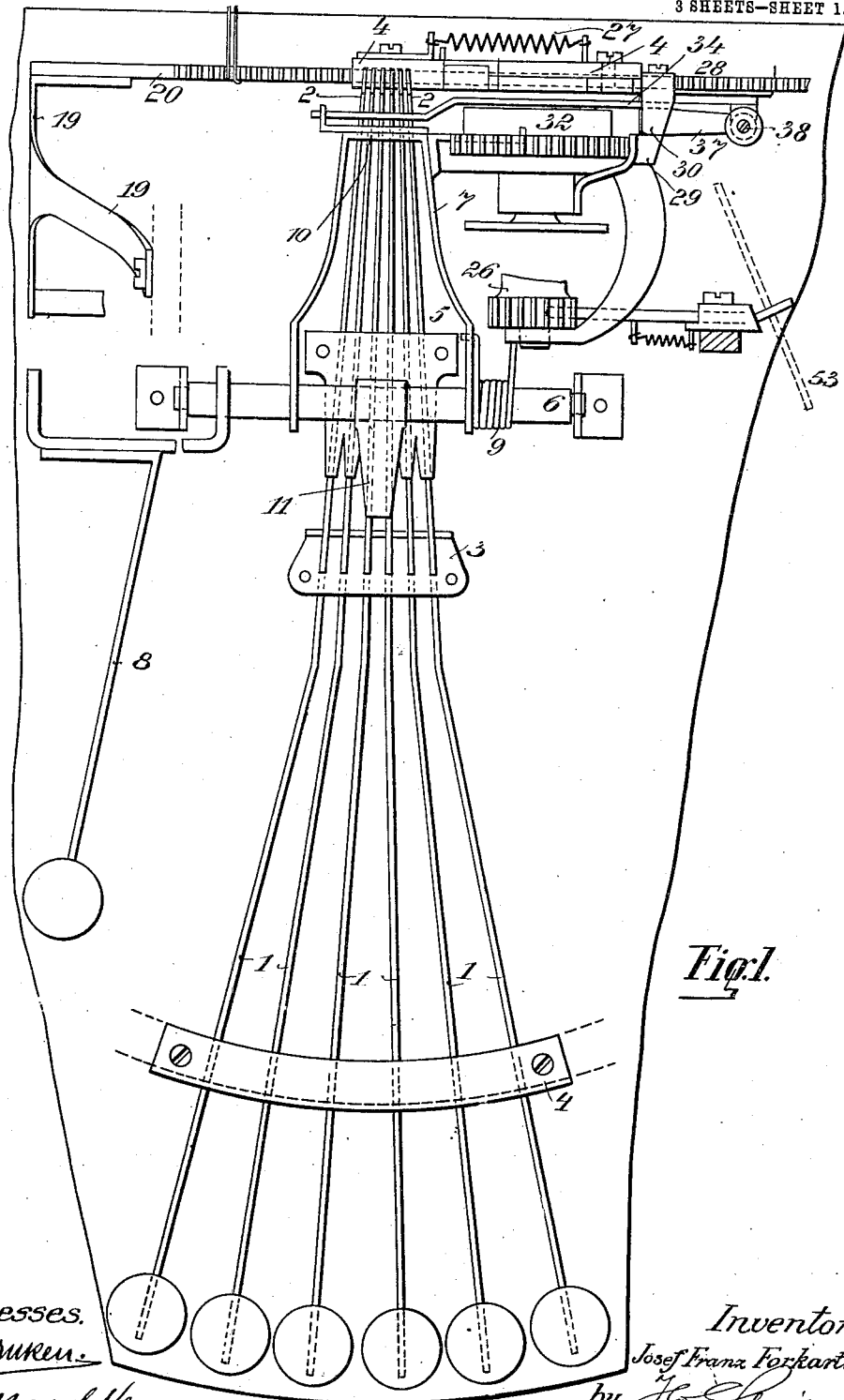


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

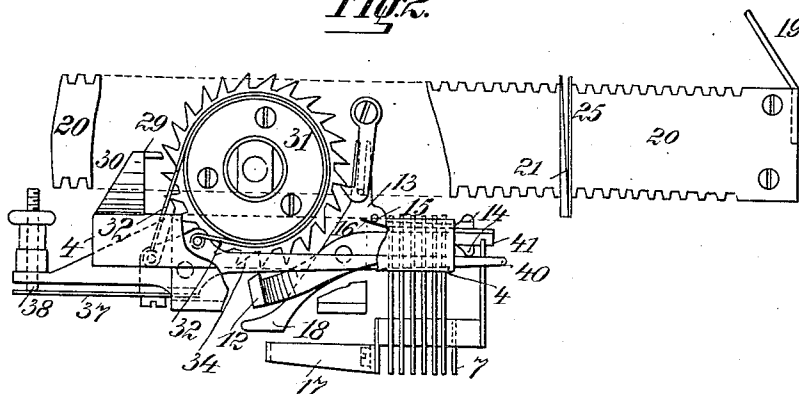


Fig. 3.

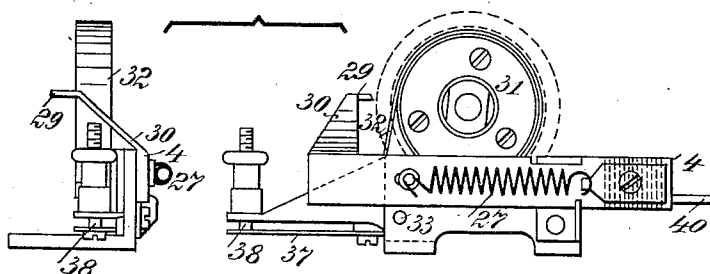
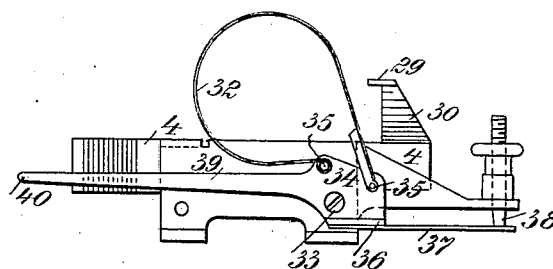


Fig. 4.



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3 SHEETS—SHEET 3.

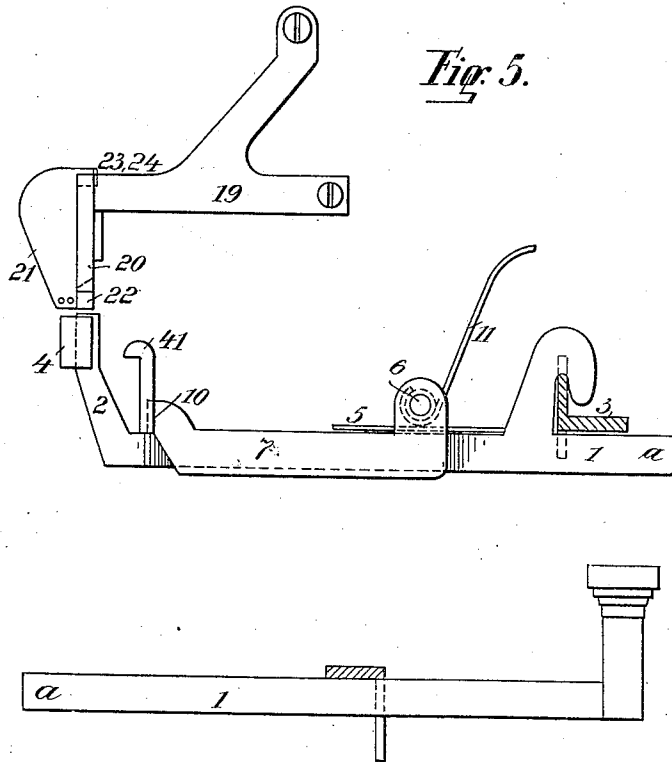


Fig. 5.

Fig. 6.

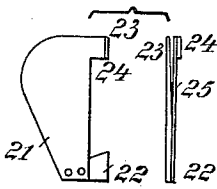


Fig. 7.

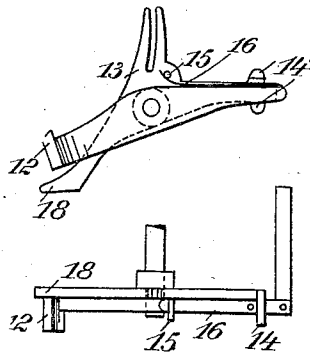
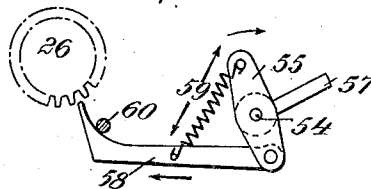


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOSEF FRANZ FORKAEETH, OF INNSBRUCK, AUSTRIA-HUNGARY, ASSIGNOR TO
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TYPE-WRITING MACHINE.

936,229.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed January 18, 1906. Serial No. 296,693.

To all whom it may concern:

Be it known that I, JOSEF FRANZ FORKAEETH, a citizen of the Empire of Austria-Hungary, and resident of Innsbruck, in the Empire of Austria-Hungary, have invented a certain new and useful Improvement in Type-Writing Machines, of which the following is a specification.

My invention relates to improvements in type-writing machines in which special keys and connected mechanism are provided for alternately releasing the platen carriage and arresting the same after it has performed sliding movements of a predetermined extent greater than the distance from one tooth of the usual rack to the next, and the objects of my improvement are first to provide a tabulator mechanism in which the release of the feed wheel of the platen carriage is effected in a novel manner and by improved means, and second to reduce the force of the blow imparted by the released platen carriage to the arresting mechanism when performing a comparatively large jump. I attain these objects by the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a partly broken plan view, with certain parts omitted, showing my improvement as applied to a type-writing machine of the Hammond type. Fig. 2 is a corresponding rear end elevation with certain parts broken and others omitted. Fig. 3 is a detail of a brake mechanism shown in end view and in side view. Fig. 4 is a side view of the same mechanism as seen from the opposite side, with parts omitted. Fig. 5 is an elevation of one of the tabulator key-levers and certain mechanism cooperating therewith, the said lever being shown broken. Fig. 6 is a detail of a stop or "rider" for arresting the movement of the platen carriage, seen in end view and side view. Fig. 7 is a side view and plan of a lever mechanism to be referred to. Fig. 8 is a detail of the mechanism for imparting an opposite step by step movement to the platen carriage.

The mechanism constituting my invention is shown in the drawings, and will hereinafter be described, as applied by way of example to a type-writing machine of the well known Hammond type; I wish it to be understood, however, that I do not limit

my invention to its application to this particular type of machine.

The key-levers 1 of the tabulator have their end-portions 2 located at a distance apart which corresponds to that of the letters in the line, the said levers being each fulcrumed at, or suspended from, a part 3. A comb-shaped spring 5 normally holds the forward or shorter lever arms depressed, thereby maintaining the longer arms, which are provided with suitable keys, in the raised position.

Above the shorter arms of the said key-levers is disposed a shaft 6 provided, on the one hand, with a yoke 7 and, on the other hand, with a special arm or lever 8 having a key at its free end. A spring 9 tends to rotate the said shaft 6 in such a direction as to maintain the yoke 7 with its transverse portion 10 in engagement with the shorter arms of the key-levers 1 and, at the same time, to keep the keyed arm or lever 8 in the raised position. The shaft 6 also carries an arm 11 which—in addition to the usual spacing key not particularly shown in the drawing—acts to operate the hammer locking device of the Hammond type-writing machine.

The construction and arrangement of the usual lever mechanism for releasing the platen-carriage feed-wheel of the Hammond machine is according to my present invention modified in the following manner: As shown in Figs. 2 and 7 the shorter end of the lever 12 is provided with a rectangular bend which forms a pawl for engaging between two teeth of the platen-carriage feed-wheel and thereby suitably limiting to the extent of a single step the rotary movement performed by the said feed-wheel upon any one of the writing keys having been depressed and the feed-wheel thereby released. On the axis of this lever 12 is mounted an auxiliary lever 13 carrying two stops 14 for limiting the extent of movement of the said lever 13 relatively to the lever 12. A spring 16 secured at its one end to the lever 12 and pressing with its other end against a pin 15 on the auxiliary lever 13 acts to normally retain the latter in the position shown in Figs. 2 and 7, that is to say, in that position in which the lowermost one of the two stops 14 is in engagement with the lever 12. The auxiliary lever 13 acts to release the ham-

mer of the Hammond machine and is normally operated by the main releasing lever 12 acting on the lowermost stop 14 of the said auxiliary lever and depressing the same at its right hand end. The said auxiliary lever may, however, also be operated independently of the main releasing lever. This occurs when the arm 17 rigidly secured to the yoke 7 (as shown in Fig. 2) is raised by the upward movement of the said yoke and on its part raises the lower end 18 of the said releasing lever 12. In such case the movable pawl controlled by the upwardly extending bifurcated portion of the said lever 12 (and shown in Fig. 2 as engaging a tooth of the feed-wheel) will be withdrawn from engagement with the feed-wheel, without at the same time causing the bent end portion of the main releasing lever 12 to engage the teeth of the feed-wheel, as would otherwise be the case. This action is due to the free play provided between the upper stop 14 and the upper engaging surface on the right hand arm of the lever 12. The feed-wheel will then be entirely released and free to rotate at will. The force of the movement thus imparted to the platen carriage is reduced by the following means: The side portions of the platen carriage are provided with arms 19, the free ends of which support the bar 20. This bar is provided at its upper and lower edges with teeth, the spacing of the latter corresponding exactly with the extent of the step by step movements of the platen carriage from one letter to the next.

Suitable detachable stops or "riders" 21, shown in side and end view in Fig. 6, may be attached to the toothed bar 20, in the manner shown in Figs. 2 and 5, at distances apart corresponding with the jumps to be performed by the platen carriage when the tabulator is used. Each of these stops or "riders" consists of a flat piece of metal having a lower hooked portion 22 and an upper projection 23 and of a flat spring 25 attached thereto at its lower end by screws, as shown or otherwise. The said spring is, substantially of the same shape in lateral outline as the flat piece of metal, being only without the lower hooked portion and having at or near its upper end a lateral angular extension or hook 24. By reason of a certain taper in the sectional shape of the flat piece of metal the upper end of the flat spring 25 normally extends somewhat away from, and out of contact with, the corresponding end surface of the said piece of metal, as will be seen from Fig. 6. In applying the said stops or "riders" to the toothed bar the operator inserts the lower hooked portion 22 into the respective interstice of the lower teeth of the bar 20 and then places the upper projection 23 as well as the hook-shaped end 24 of its flat spring

25 into the interstice between the corresponding two upper teeth of the bar 20, whereupon the said hooked end of the spring will engage the rear face of the adjoining tooth. In the movement of the platen carriage the said stops or "riders" will pass immediately above the end portions 2 of the tabulator key-levers 1, so that when one of these lever ends has been raised by the operator having depressed the respective key the next stop or "rider" arriving at the raised lever end will engage therewith and the platen carriage will become arrested in this position.

As the movement of the released platen carriage continues, its feed-wheel attains a certain impetus which it is desirable to specially counteract to a certain extent, seeing that the said feed-wheel is not integral with the pinion 26 which engages the toothed bar of the platen carriage. This is effected by the following means: The plate 4, in which the ends 2 of the tabulator key-levers 1 are guided, is made capable of a limited longitudinal sliding movement, the spring 27 tending to retract the said guide plate 4 into its normal position. As will be seen from Figs. 1 and 2, the guide plate 4 is provided with an arm 30, having a laterally projecting end portion 29 which is in such position relatively to the teeth of the feed-wheel as to allow the teeth of the latter to barely pass the end 29 of the said arm 30 without coming in contact therewith in the rotation of the feed wheel. When the operator depresses a tabulator key and when one of the stops or "riders" strikes the raised lever end 2, the guide plate 4 is carried along a short distance against the action of the spring 27, the end 29 of the arm 30 being thereby brought into the line of movement of the teeth of the feed wheel so as to prevent further rotation of the latter. Upon the tabulator key being no longer depressed the end 2 of the respective key-lever 1 returns to its lower position, thereby becoming disengaged from the stop or "rider", the arm 30 is withdrawn from the teeth of the feed wheel and the latter thereby released as well. At the same time the platen carriage moves forward a short distance until the feed wheel is again stopped in the usual manner by the movable pawl engaging with the teeth of the said wheel in consequence of a corresponding movement of the auxiliary releasing lever 13.

Since the movement of the platen carriage when completely released would be excessively rapid and the shock resulting from its sudden stoppage rather severe, I provide for a certain braking action to thus further reduce the force of the movement of the platen carriage when the tabulator keys are being used. To this end the feed wheel carries a drum 31 which is partly sur-

rounded by a brake band 32, the ends of the latter being suitably secured on the brake lever 34 by pins 35 or otherwise, as shown in Fig. 4. The brake lever 34 fulcrumed on the screw 33 carries at its one end 36 a flat spring 37 the free outer end of which extends below a set screw 38. It will thus be seen that the said spring will tend to so turn the brake lever as to cause the brake to be applied. The tension of the spring 37 may be varied by means of the set screw 38 so that it is thus rendered possible to adjust the braking effect as required. The arm 39 of the brake lever 34 extends with its outer end 40 below a hook 41 provided on the yoke 7, as will be seen from Figs. 1 and 5. This hook 41 normally engages the end 40 of the brake lever 34 to restrain the spring 37 from exerting its tension and thereby causing the brake to be applied, and when the hook 41 is raised to release the end 40 of the brake lever the latter is so moved by the spring 37 as to apply the brake action. Thus, when any one of the tabulator keys—or the key on the arm 8—is depressed, the said hook 41 will allow the brake lever 34 to move upward thereby applying the brake; whereas when any one of the above named keys is no longer depressed the said hook 41 will draw the brake lever 34 downward thereby releasing the brake.

The effect of the braking action upon the movement of the platen carriage in the normal step by step movement of the carriage during the regular operation of writing, that is to say when the tabulator is not actually used, is so moderate, provided that the gearing is properly dimensioned, as not in any way to reduce the speed of operation in writing.

The usual Hammond machine is generally provided with a mechanism by means of which the platen carriage may be given a step by step movement in a direction opposite to that in which it generally travels. This so-called return key mechanism as heretofore constructed consisted of a comparatively large number of parts. Thus, the transmission of the movement, by means of which the platen carriage is to be made to travel in the opposite direction, from the return key unto the pinion 26 which engages with the rack bar of the platen carriage, heretofore necessitated the employment of a second pinion continually engaging the pinion 26; and on the axis of this second pinion there was provided a ratchet wheel carrying on its axis a pawl engaging with the said ratchet wheel. In addition to these parts the following other parts were employed: two springs, a key-lever, a universal joint and a connecting part.

According to my present invention the improved return key mechanism consists, only of the following parts; a key-lever 53

(shown in dotted lines in Fig. 1 of the drawing), a two-arm lever 55 mounted to turn on the axis 54 and carrying a peg 57 extending into the universal joint of the key-lever, a pawl 58 and a spiral spring 59.

The mode of operation of the mechanism above described, and shown in Fig. 8 of the drawing, is as follows: When the operator depresses the usual return key provided on the right hand side of the machine (at the end of 53) lever 55 is turned in the direction of the arrow shown in Fig. 8 and the pawl 58 is moved to the left. The free end of this pawl being drawn upward by the spring 59 into contact with the pin 60 is thereby made to engage the teeth of the wheel 26, rotating the latter to the extent of one tooth. Another spring then raises the key, so that upon the operator withdrawing his finger from the key, the parts named will return into their position of rest, the pawl 58 being withdrawn from engagement with the teeth of the wheel 26. The peculiar mode of arrangement of the spring 59 causes the pawl to be pressed firmly into engagement with the teeth of the wheel 26, thus absolutely preventing any failure in the operation of the mechanism.

The tabulator mechanism described possesses various important advantages as compared with similar mechanisms heretofore known. The tabulator key levers are each formed in a single piece throughout their entire length, that is to say, from the end which bears the key to the other end which acts upon the mechanism for arresting the movement of the platen carriage, and the keys are operated in a downward direction, the same as the regular writing keys; these two advantages being here secured by the fact that the keys and their levers are mounted in the bottom portion of the machine and that the toothed bar to which the detachable stops or "riders" are applied is located comparatively low in the machine. In the usual tabulator mechanism heretofore known the key-levers generally consisted of a number of jointed parts, this having been found necessary in order to provide for a downward direction of movement of the keys. In my improved construction the brake mechanism is very reliable and efficient in its operation by reason of the fact that I employ a band brake, which provides a more yielding action and reduces the wear to some extent. This improved braking device also admits of a very fine adjustment. Moreover, it is indirect in its action and not positive, the brake band being normally maintained in its inoperative position by the tabulator mechanism and being automatically applied when a tabulator key is acted upon. The movable plate 4 acts in the manner of a cushion which receives and neutralizes the greater part of the shock

due to the sudden jump of the platen carriage. Another feature of merit in my improved construction consists in that the keyed arm or lever 8 and its connections 6, 7 and 9 may be employed as a special means, either in addition to the usual releasing mechanism or in substitution therefor, for releasing the platen carriage.

What I claim as my invention, and desire to secure by Letters Patent, is:

1. The combination in a type-writer, of a bar having detachable stops thereon, a number of tabulator levers, a movable guide plate actuated by the said levers, means for returning the said guide plate into its position of rest, and means on said guide plate for engaging the platen-carriage feed-wheel when the guide plate is moved out of its position of rest.
2. The combination in a type-writer, of a bar having detachable stops thereon, a number of tabulator levers, a movable guide plate receiving the rear ends of the said levers, a spring tending to return the said guide plate into its position of rest, and an arm on said guide plate mounted to engage the platen-carriage feed-wheel when the guide plate is moved against the action of its spring.
3. The combination in a type-writer, of a number of tabulator levers, a drum mounted on the axis of the platen-carriage feed-wheel, a brake band extending partly around said drum, an operating lever engaging said brake band, actuating means tending to turn said lever into the operative position, and means controlled by the tabulator levers in

their position of rest for normally retaining the brake operating lever in its inoperative position contrary to the action of the actuating means.

4. The combination in a type-writer, of a number of tabulator levers, a drum mounted on the axis of the platen-carriage feed-wheel, a brake band extending partly around said drum, an operating lever engaging said brake band, a spring tending to turn said lever into the operative position, means for adjusting the tension of said spring, and means controlled by the tabulator levers for retaining the brake operating lever in its inoperative position contrary to the action of said spring in the position of rest of the tabulator levers.

5. The combination in a type-writer, of a bar, detachable stops thereon, a number of tabulator levers, a slidable guide plate actuated by said levers, a spring for normally retaining said guide plate, an arm on said guide plate for engaging the platen-carriage feed-wheel, a drum on the axis of said platen-carriage feed-wheel, a brake band embracing said drum, an operating lever engaging said brake band, a spring for actuating said lever, a set screw for varying the tension of said spring, and a hook controlled by the tabulator levers for retaining the brake operating lever in its inoperative position.

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