

G. M. N. LAFARIE.
 COMBINED TYPE WRITER AND MUSIC PRINTER.
 APPLICATION FILED JAN. 7, 1908.

926,947.

Patented July 6, 1909.

2 SHEETS—SHEET 2.

Fig. 5.

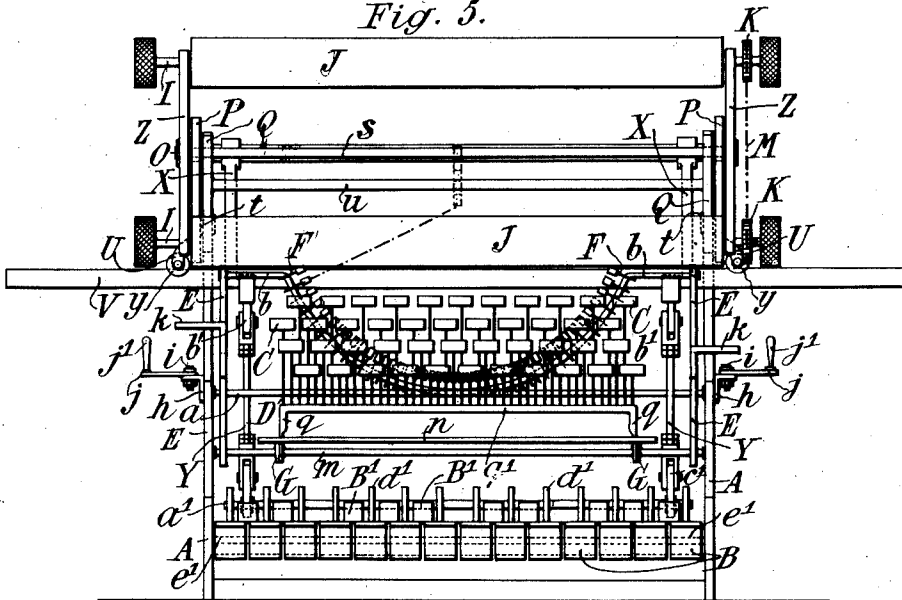
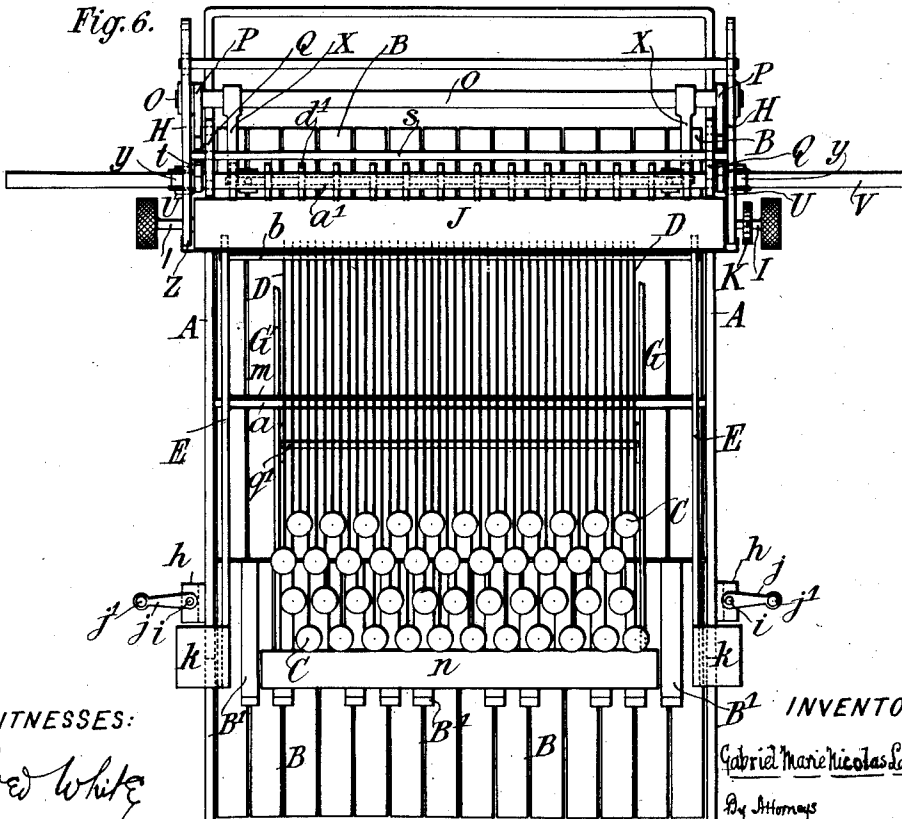


Fig. 6.



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COMBINED TYPE-WRITER AND MUSIC-PRINTER.

No. 926,947.

Specification of Letters Patent.

Patented July 6, 1909.

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To all whom it may concern:

Be it known that I, GABRIEL MARIE NICOLAS LAFARIE, a citizen of the Republic of France, residing at Cognac, Charente, France, have invented certain new and useful improvements in Combined Type-Writers and Music-Printers, of which the following is a specification.

This invention relates to a machine for writing music, that is to say a machine which fulfils the combined functions of printing the signs and letters used in music in the position which they ought to occupy on the various staves, the printing being made on the staff, including the upper and lower lines.

In the majority of known typewriting machines the same set of the keys serves to print the letters of the two fonts and the various signs, each lever carrying two characters and the paper carriage being subjected at the proper moment to a vertical or horizontal displacement for printing the capitals and certain signs.

In a machine constructed according to this invention, which is for the purpose of printing music, while at the same time capable of serving as an ordinary typewriter, the parts are arranged in such a manner that instead of displacing a roller the frame carrying the whole of the printing keys is displaced accordingly as the machine is to be used for printing music or for printing the characters of the alphabet. By displacing the whole of the keys the printing levers are brought into a position suitable for imprinting the desired signs such as the musical notes, or the small letters, or the capitals, all of which are arranged correspondingly, so that the paper receives the impression of the keys as it passes the printing point carried by its carriage.

When the machine is printing music, it is necessary that the printing point should be upon the appropriate line of the staff. For this purpose the paper carriage is so constructed that it can be displaced by the operation of piano keys (that is to say, keys resembling piano keys and arranged exactly like such keys) arranged in front of the ordinary typewriting keys, each of which piano keys determines exactly the position which the note will have on the staff to which it belongs. The object of operating the piano keys, therefore, is to displace the paper carriage, and the paper which it carries, to a suitable degree.

The piano keys are only used when printing music, and before a typewriter key is depressed for imprinting a note the appropriate piano key must be struck to bring the printing point on to the desired place in the staff.

The piano keys, fourteen in number, give the intervals for two middle gamuts. The upper octave is obtained by the operation of a cam which depresses the paper carriage through the interval of an octave, and the lower octave is obtained by the operation of the same cam raising the paper carriage through the interval of an octave. The movement of the paper up or down for the space of a single note in any octave is effected by means of a keyboard resembling a portion of the keyboard of a piano, as hereinafter explained in detail.

The principle of the invention having been thus explained, a machine suitable for putting it into practice will now be described with reference to the accompanying drawings.

Figure 1 is a side elevation of the machine. Fig. 2 is a side elevation of the frame that carries the printing keys. Fig. 3 is a front view of the left hand end of this frame, and Fig. 4 is a front view of the right hand end thereof. Figs. 5 and 6 are respectively a front elevation and a plan of the principal parts of a machine comprising the invention.

The frame A of the machine has two key-boards, one having keys B similar to those of a piano, and the other keys C analogous to those of an ordinary typewriter. Each of the keys C operates a lever D centered on an axle *a*, the ends of which extend through a frame E which supports the whole of this keyboard comprising the typewriting keys. This frame E carries an axle *b* on which are pivoted all the levers F which carry the various characters, that is to say the musical notes *c*, the small letters *d*, and the capitals or other printing signs *e*. The end of each lever D is connected with its character lever F by a link *f*. When the frame E is in the position shown in full lines in Fig. 1, it is adapted for ordinary typewriting, that is to say the characters *d* will be printed by operating the keys. For printing the capitals the frame E is lowered into a position which is not shown. When music is to be printed the frame is moved into the position shown in dotted lines in Fig. 1, which position it tends to take under action of the spring R,

the effect of the spring being limited by the stop *g*.

The stop devices shown in Figs. 2, 3 and 4, serve to keep the frame E in the two lower positions, that is to say in the positions in which the spring R is more or less stretched and in which ordinary typewriting of the upper and lower case characters is possible. On each cheek of the frame A is a bracket *h* carrying the fulcrum *i* of a lever *j* which can be turned by a handle *j'* to bring it above the flange *k* on the frame E. On the right hand side, Fig. 4, this flange is at a lower level than that on the left hand side, Fig. 3, and when engaged by the corresponding lever *j* serves to hold the frame in the position for typewriting the small letters, the flange on the left hand side being engaged by the corresponding lever *j* when the capitals are to be printed. In Fig. 4 the lever *j* has been engaged with the lower flange *k* and this is also the position in Fig. 1, the machine being thus adapted for printing small letters. When a large number of capitals has to be printed in succession the frame E is allowed to rise until the flange at the left hand end engages a corresponding lever *j*.

The mechanism so far described suffices to enable the operation of the keys C to print musical notes or ordinary typewriting in two fonts, as may be desired.

At the lower part of frame E there are two bearings for a shaft *m* upon which are centered levers G connected at the front end by a bar or pedal *n*, and at the rear end by a shaft *o* which is linked by a rod *o'* controlling by any suitable known mechanism the lateral advance of the paper carriage. This mechanism has been omitted from the drawing for the sake of clearness.

The upward stroke of levers G is limited by the stop rod *p*. The levers G carry up-rights *q* in which is mounted the rod *q'* constituting a support for all the levers D. When any one of the keys C is operated, the rod *q'* is depressed and with it the levers G, so that the rod *o'* which controls the advance of the paper carriage is operated.

The paper carriage comprises two arms H fixed together by the transverse spindles I which are the axles of two rollers J over which the paper to be imprinted passes. The spindles I carry chain wheels K geared together by the chain M. The paper is made to travel by the rollers J and N. The arms H turn on the shaft O upon which they can also travel transversely of the machine. There are also mounted on the shaft O cheeks P which are close against the arms H and are between them. At the upper part of each cheek is a slot *r* in which engages the rod *s* that unites the arms H transversely of the machine. Below this slot each cheek P carries a pivot *t* on which turns a cam Q. The two cams are connected by a transverse

rod *u* in such a manner that they move together. At the upper part each cam has a slot in which there are three notches *v*, *v'*, *v''*, and the formation of the cam is such that the rod *s* is more or less depressed accordingly as it is engaged in one or other of the said notches. Thus this rod *s* has three positions at different levels and determines the position of the platen Z carried by the arms H, which position is varied for the purpose of printing musical notes either on the staff, or on and between the supplementary upper and lower lines. The displacement of the cams Q Q may be made easily by hand, the sides of the notches *v*, *v'*, *v''* being suitably rounded to allow of this displacement without the necessity of lifting the carriage.

It will be understood that when the rod *s* is engaged in the notches *v'*, the signs will be printed on the staff. When this rod *s* is resting in the cam notches *v*, whereby the paper will be raised the interval of an octave, the lower octave will be printed after depressing the appropriate one of the seven left-hand keys of the key board. Similarly when the rod *s* is engaged in the notches *v''* of the cam, whereby the paper will be lowered the interval of an octave, the signs of the upper octave will be printed after having depressed the appropriate one of the seven keys B of the right hand half of the key-board. For the notes from and beneath the "do" (key 1 on the left) and for those from and beneath the "la" (key 13), small supplementary lines should be printed before striking the note. To this end four keys C will be provided with signs forming a line located more or less apart from the last line of the staff.

The lower edge of the tail of each cam Q is serrated as at *x* and the teeth are engaged by a spring detent S. The detent S insures the cam's moving fully to one or other of its three important positions, preventing its remaining in position with the rod *s* between two of the notches *v*, *v'*, *v''*. This pointed detent is also a safety catch which holds more surely than the rod *s*. The spring T connected with the back of the carriage is for the purpose of balancing the weight of the latter.

It remains to explain how the whole carriage is mounted to allow that line of the staff on which the musical note is to be printed to be brought exactly into line with the printing point for imprinting each note, that is to say into the line *z* indicated in Fig. 1. For this purpose each cheek P carries a fork U in which is mounted a roller *y*. The two rollers rest on a bar common to both carried in arms X from the shaft O and this bar V is itself supported on the ends of two vertical rods Y, one on each side of the machine, connected with the bar by a pivot *b'*. On its lower end each rod carries pivoted to it a bearing for a spindle *a'* on which turn fourteen rollers *d'*, this bearing being pivoted

to the rod as at e' . The joints $b' c'$ are for the purpose of allowing a slight relative deviation of these rods which lift the paper carriage for printing the musical notes as already specified.

The downward stroke of the spindle a' is limited by two stops on the cheeks of the frame A, and each of the fourteen rollers d' corresponds with one of the keys B which are depressed for the purpose of suitably lifting the paper carriage. All the keys B, whatever may be the note to which each corresponds, have all the same stroke in order to facilitate their manipulation by the fingers, such manipulation being difficult if the stroke varies with the note represented. For this purpose the levers carrying the keys are centered at different distances from their ends as indicated at e' in Fig. 1. Thus the same vertical stroke of a key corresponds with a different stroke for the other end of the lever carrying it. It follows that the roller d' corresponding with the key depressed is more or less raised suitably with the note in question, and spindle a' of the rods Y and the paper carriage resting upon the rod V are correspondingly differently raised. The keys marked B' are black, and are fixed, merely serving to make the piano key-board B resemble that of a normal key-board and to easily recognize the key 1.

Having thus described the nature of my said invention, and the best means I know of carrying the same into practical effect, I claim:—

1. A combined music printing and typewriting machine, comprising a paper carriage, a shaft on which the said paper carriage can move laterally, a horizontal rod on which the said carriage rests, fourteen piano keys, levers operated by the said piano keys, fulcrums on which the said levers turn each of the said fulcrums being so located that while all the piano keys make the same stroke the operative ends of the levers make different strokes, vertical rods supporting the said horizontal rod, a spindle connecting the lower end of the said vertical rods, and rollers adapted to turn on the said spindle, each of the said rollers bearing upon a corresponding lever of the said levers.

2. A combined music printing and typewriting machine, comprising a paper carriage, a shaft on which the said carriage turns, arms to the said carriage, cheeks mounted on the said shaft, slots in the said cheeks, a rod extending transversely of the said carriage engaging in the said slots, cams pivoted on the said cheeks, a roller carried by the lower part of each of the said cheeks, a horizontal bar on which each of the said rollers rests, piano keys, levers operated by the said piano keys, and mechanism adapted for raising the said horizontal bar when any one of the said piano keys is struck.

3. A combined music printing and typewriting machine, comprising a paper carriage, a shaft on which the said carriage turns, arms to the said carriage, cheeks mounted on the said shaft, slots in the said cheeks, a rod extending transversely of the said carriage engaging in the said slots, cams pivoted on the said cheeks, a slot in each of the said cams, three notches in the said slot each notch being adapted to receive the said transverse bar, a bar connecting the said cams, spring detents adapted to engage the said cams, a roller carried by the lower part of each of the said cheeks, a horizontal bar on which each of the said rollers rests, piano keys, levers operated by the said piano keys, and mechanism adapted for raising the said horizontal bar when any one of the said piano keys is struck.

4. A combined music printing and typewriting machine, comprising typewriting keys, a frame carrying the said keys, a machine frame, pivots in the said machine frame on which the said typewriting key frame turns, lateral cheeks to the said machine frame, a bracket carried by each of the said cheeks, a lever adapted to turn in the said bracket, and lateral flanges on the said typewriting key frame adapted to be engaged by the said levers.

5. In combination, the paper carriage, a horizontal shaft O about which the carriage is freely movable upward or downward and along which the carriage is movable laterally, a horizontal rod V upon which the carriage rests, and keys arranged like the keys of a piano and serving as preparatory keys and arranged to lift said horizontal rod V a greater or less distance, and with it said carriage, the vertical movement of the carriage serving to bring the line or space of the staff on the paper exactly to the level upon which the musical sign or character is struck.

6. In combination, a series of keys B arranged like the keys of a piano, having levers with pivotal points e' at different distances from the ends of the keys, so that a uniform depression determines a different elevation at the opposite extremity of each of the several keys, a rod a' elevated by said opposite ends of the keys, and means whereby the movement of the rod a' determines the greater or less vertical movement of the paper carriage.

7. In combination, a series of keys B arranged like the keys of a piano, having levers with pivotal points e' at different distances from the ends of the keys, so that a uniform depression determines a different elevation at the opposite extremity of each of the several keys, a rod a' elevated by said opposite ends of the keys, means whereby the movement of the rod a' determines the greater or less vertical movement of the paper carriage, the keys B being fourteen in number to form

two octaves less a single note, and a roller d' carried on said rod a' and in engagement with the rear ends of said keys.

8. In combination, a carriage adapted to
5 be raised and lowered, and a pivoted cam Q with a curved edge and with notches $v\ v'\ v^2$, a rod s connected to the carriage and adapted to be received in said notches, so that by the movement of said cam the carriage may be
10 raised or lowered above or below the mean position, so as to bring the point at which the musical signs or characters strike not only within the range of the staff but also below the staff or above the staff.

15 9. In combination, a carriage adapted to be raised and lowered, and a pivoted cam Q with a curved edge and with notches $v\ v'\ v^2$, a

rod s connected to the carriage and adapted to be received in said notches, so that by the movement of said cam the carriage may be
20 raised or lowered above or below the mean position, so as to bring the point at which the musical signs or characters strike not only within the range of the staff but also below the staff or above the staff, a pair of said
25 cams being united by a transverse rod u , and a spring pawl S engaging the tails of said cams to hold them in any desired position.

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

GABRIEL MARIE NICOLAS LAFARIE.

Witnesses:

M. MORRISON,
A. NORMAND.