No. 729,873. PATENTED JUNE 2, 1903.

J. LAGARDE.

TYPE WRITING OR SIMILAR MACHINE AND APPARATUS FOR USE IN CONNECTION THEREWITH.

APPLICATION FILED JULY 27, 1901.

NO MODEL. 3 SHEETS—SHEET 1.

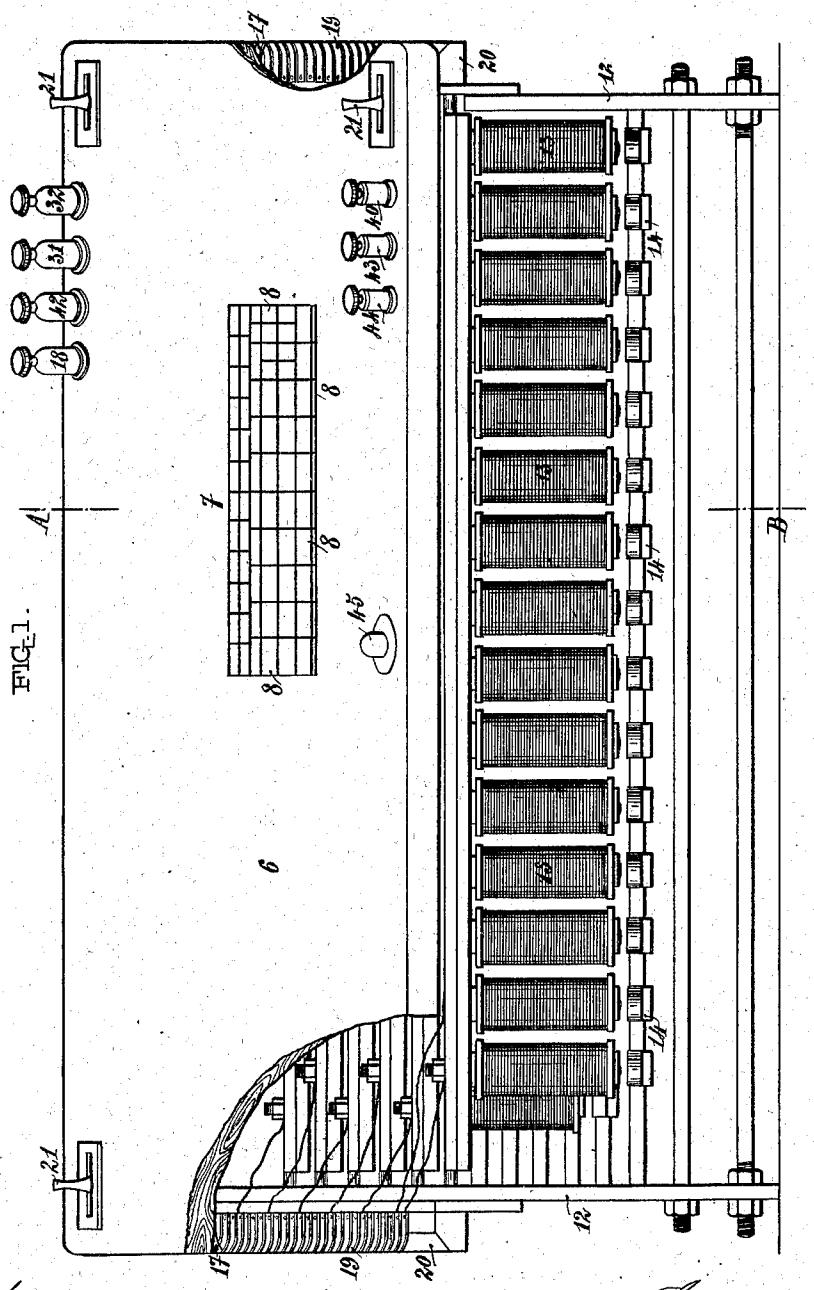


FIG. 1.

Witnesses:
L. L. Burket.
F. G. Radelfinger.

Inventor:
Jules Lagarde,
By William E. Boulter
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 729,873. PATENTED JUNE 2, 1903.

J. LAGARDE.

TYPE WRITING OR SIMILAR MACHINE AND APPARATUS FOR USE IN CONNECTION THEREWITH.

APPLICATION FILED JULY 27, 1901.

NO MODEL. 3 SHEETS—SHEET 2.

FIG. 2.

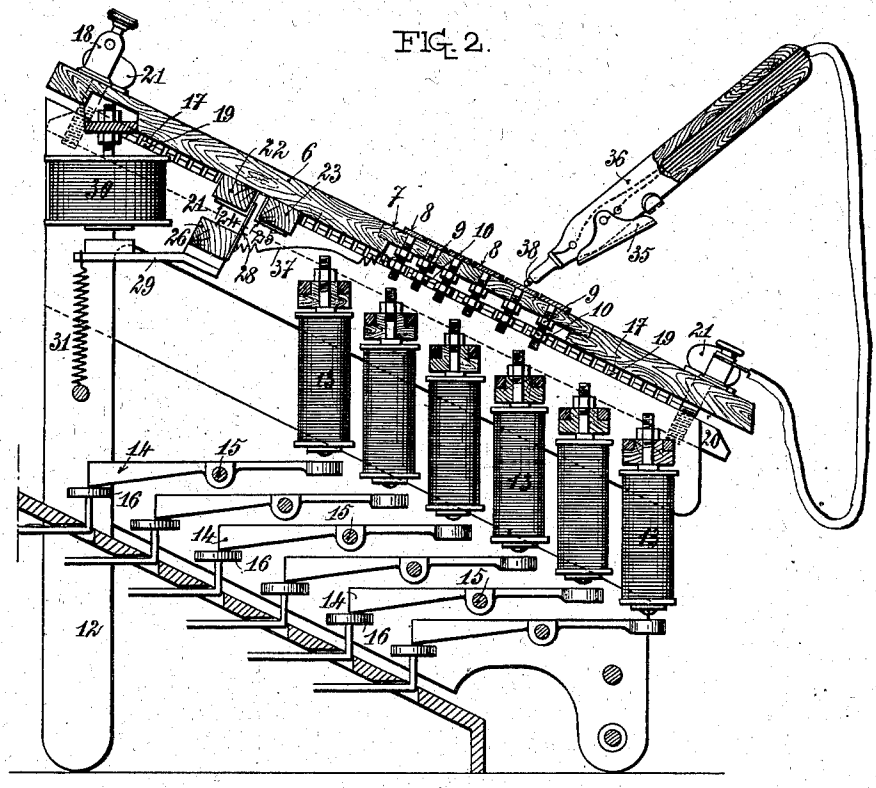
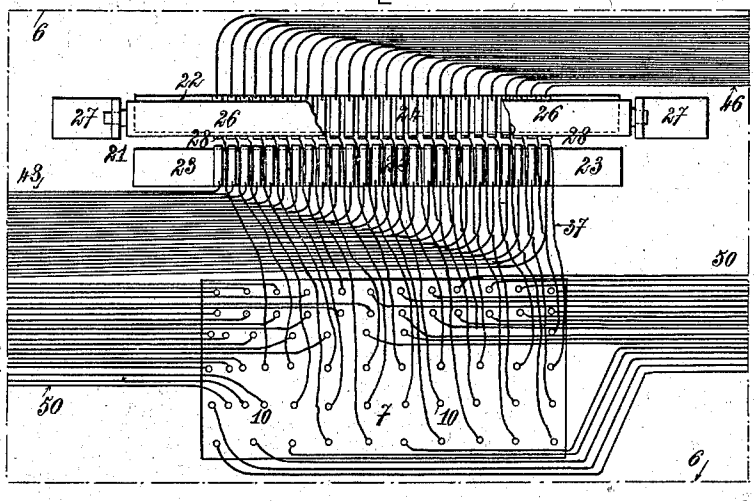


FIG. 4.



Witnesses:
L. L. Burket
F. G. Radelfinger

Inventor:
Jules Lagarde,
By William E. Boulter
Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 729,873. PATENTED JUNE 2, 1903.

J. LAGARDE.

TYPE WRITING OR SIMILAR MACHINE AND APPARATUS FOR USE IN CONNECTION THEREWITH.

APPLICATION FILED JULY 27, 1901.

NO MODEL. 8 SHEETS—SHEET 3.

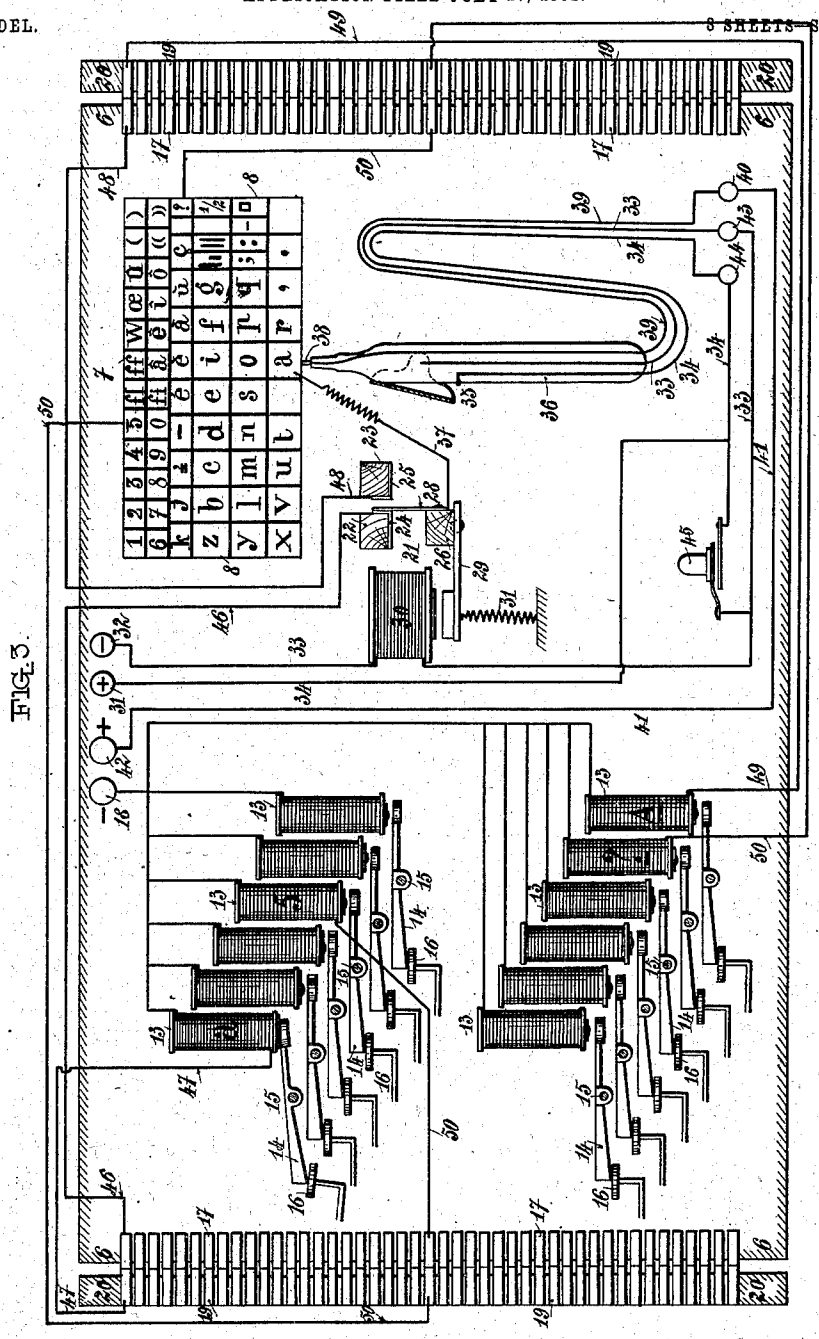


FIG. 3.

Witnesses:
L. L. Burket.
F. G. Radelfinger.

Inventor:
Jules Lagarde,
By William E. Boulter,
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 729,873. Patented June 2, 1903.

UNITED STATES PATENT OFFICE.

JULES LAGARDE, OF CLERMONT-FERRAND, FRANCE.

TYPE-WRITING OR SIMILAR MACHINE AND APPARATUS FOR USE IN CONNECTION THEREWITH.

SPECIFICATION forming part of Letters Patent No. 729,873, dated June 2, 1903.

Application filed July 27, 1901. Serial No. 69,950. (No model.)

To all whom it may concern:

Be it known that I, JULES LAGARDE, a citizen of the Republic of France, residing at Clermont-Ferrand, France, have invented certain new and useful Improvements in or Relating to Type-Writing or Similar Machines and Apparatus to be Used in Connection Therewith, (for which I have made application for Letters Patent in France under No. 307,663, dated January 29, 1901,) of which the following is a specification.

The present invention relates, essentially, to an apparatus intended to work in combination with the keyboard of type-writing or reproducing machines of a variety of kinds, such as writing-machines and the like, for the purpose of considerably increasing the work produced by such machines and apparatus.

In the accompanying drawings, Figure 1 represents a front view of one embodiment of the invention; Fig. 2, a vertical section on the line A B of Fig. 1; Fig. 3, a schematic view showing the electric interconnection of some parts only which are intended to work for different purposes or to be used for producing different characters, each of the other parts being similarly arranged; Fig. 4, a partial plan view of the arrangement below the desk of the apparatus, showing especially the connection between the keys of the ordinary letters of the alphabet with the switch device of the shifting or switch current.

The apparatus comprises a desk 6, corresponding in size with the keyboard of the machine, in combination with which the apparatus is intended to work. On this desk is arranged a series 7 of small metal blocks or plates 8, of rectangular or any other suitable shape, insulated from each other, on which are engraved or marked the signs, letters, numbers, or characters corresponding each to each with the characters of the various keys of the machine intended to be actuated by the apparatus. The desk 6 is supported on a metal stand or frame 12, within which are arranged as many electromagnets 13 as there are keys on the machine to be actuated. Under each of the electromagnets 13 is a lever 14, oscillating on an axis 15, one end of which lever rests above or upon a corresponding key 16 of the keyboard of the machine to be actuated, while the other lighter end is placed immediately underneath the core of the electromagnet which is to act upon it, the distance from it being such that the extent of movement resulting from the oscillation of the lever 14 will depress the corresponding key 16 sufficiently to insure a satisfactory working of the machine. One end of the wire of the electromagnet 13 is connected with an insulated flexible plate 19 on the stand 12. There are as many of these insulated plates 19, arranged side by side, as there are electromagnets 13. According to the example represented in the accompanying drawings there are ninety-two different characters to be thus actuated in the machine. Therefore forty-six of the plates 19 are arranged on each side of the desk 6. Each electromagnet is connected by the other end of its wire with a common terminal 18 on the desk 6, which terminal is also connected by a return-wire with the battery. A similar series of plates 17, similarly arranged, are mounted on the desk 6 and are brought in contact, when the latter is placed on the frame 12, with the plates 19, just described, and which are arranged insulated from each other on a bar 20, of insulating material, fixed on the frame 12 itself. Perfect contact between these series of plates 17 and 19 is insured by means of clamping-screws 21* or in any other suitable manner.

Each of the blocks or plates 8 is secured to the desk 6 by a pin with two nuts 9 and 10, of which the former serves for fixing the plate 8 and the latter for clamping a wire for the current. This wire connects the plate 8, to which it is attached, either with its corresponding plate 17 on the desk 6 and through it with the corresponding electromagnet 13 or with a special switch 21, which directs the current as required to one or the other of two electromagnets 13, each of which acts independently on the keys of the keyboard, which are marked with signs of the same value, but of different character—*i. e.*, small or capital letters, for instance.

The switch 21 consists of two bars 22 and 23, of insulating material, arranged underneath the desk 6. On these bars are fixed two series of metal plates 24 and 25, respectively, at equal distances from each other,

the two series facing each other, while each plate is also connected with a corresponding plate 17 of the desk 6. A third bar 26, mounted on pivots supported in brackets 27 at a certain distance from the bars 22 and 23, is provided with a series of metal plates 28 along one of its sides, each plate being connected by a wire 37 with its corresponding block 8, which is to be used to produce at will two different characters, such as "A" and "a." These plates 28 project into the space between the two series of plates 24 and 25 and are at such a distance from each other as to insure exact contact of these plates 28 with either the series of plates 24 or of 25, according to whether the bar 26 is swung in one or the other direction. This movement of the bar 26 is produced by the action of an electromagnet 30 on an armature-lever 29, connected to the said bar. A spring 31* tends always to draw the plates 28 into contact with the plates 24 of the commutator. When the current is made to pass through the electromagnet 30, the latter causes the bar 26 to swing with its plates 28, which thus come in contact with the other series of plates 25 of the commutator or switch device. The source of electricity actuating this commutator is independent of the one which actuates the electromagnets 13 of the keyboard and is served by wires connected at the clamps 31 and 32 and again by wires connected with clamps 43 44 and leading thence to a current-breaker or switch 35, arranged on a stylus 36, intended to be held in the hand of the operator, and with which the latter successively touches the blocks 8 in the sequence desired, an operation which will now be explained.

The contact-stylus 36 consists of a handle, of insulating material, provided with a point 38, of some good conducting metal, such as silver or the like, connected by a flexible wire 39 with the clamp 40, from which a wire 41 leads to the clamp 42, connected to the source of electricity. Two other flexible wires 33 and 34, forming part of the current-breaker or switch 35, are connected with two other clamps, one of which, 44, is in direct communication with the clamp 31 of the special circuit of the commutator, while the other, 43, is connected to the other wire 33, which passes through the electromagnet 30 of the commutator 21 to the other clamp 32 to the source of electricity. A button 45, arranged on the desk 6 and independent of the switch 35 on the contact-stylus 36, serves to do the work of the switch 35 in case of accident. The special arrangement of the commutator 21 thus allows two keys 16 to be actuated from the same block 8, thereby proportionally increasing the available number of characters on the board 7 without occupying extra space. In every case where the apparatus is used for, say, the purpose of simple type-writing or typographic composition there would only be required blocks for the small alphabet, for by simply making contact of the stylus with a block either a capital or small letter can be printed, according to whether the switch 35 is depressed or not.

The working of the apparatus will be easily understood by a study of the electric arrangement schematically represented in Fig. 3. In this view only some units and the essential connections between them are illustrated. Let us, by way of example, assume that the operator wishes to actuate the key of a type-writing machine which corresponds to the letter "a." Holding the stylus 36 in one hand without allowing the fingers to act on the switch 35, he touches with its point the block *a*. The current coming through clamp 42 by way of wire 41, clamp 40, wire 39, passes through said block *a* into its wire 37, thus connecting the block with the bar 26 of the switch, which, not being actuated, has its plates 28, owing to the action of spring 31*, pressed against the plates 24 of the bar 22. The current therefore passes through that one of the plates 24 which is connected through a wire 46 with the corresponding plates 17 and 19, whence it flows through a wire 47 to the electromagnet 13, which corresponds with the key of the letter "a" of the keyboard. The electromagnet 13, having thus been energized, depresses the said key 16. Should now the operator desire to actuate the key corresponding to the letter "A," he first presses the switch 35, thereby bringing into action the special current of the commutator. This current passes through the electromagnet 30, attracting its armature, which turns the bar 26, whereby its plates 28 are brought in contact with the plates 25 of the bar 23. He now, while still holding the two parts of the switch 35 in contact, touches with the stylus-point the block *a*. The current this time passes through the corresponding plate 25 and the plate 28 in contact with it and electrically connected with the said block *a*. Thence it flows along the wire 48, and after having passed through the corresponding contact-plates 17 19 along the corresponding wire 49, whence it passes through the electromagnet 13, corresponding with the "A" key of the keyboard.

It will be observed that in the example represented here the blocks of the numbers and other signs beyond those of the letters of the usual alphabet are directly connected with their corresponding electromagnets—say, for instance, block 5 and block 2, which are directly connected by wires 50. Through such blocks therefore only one number or sign key can be actuated; but it is also evident that should need arise for the employment of a "capital" of the said number or a similar sign differing in size or contour—for instance, "5" and "V"—it would be easy to electrically connect the said block 8 with the commutator 21, and thereby obtain the required result.

The arrangement of the flexible plates 17 on the desk 6 and of the plates 19 on the frame

12 has been devised with a view of facilitating a rapid establishment of contact between the various contact-plates and the mounting of the various parts independently of each other, an arrangement which renders it unnecessary to disconnect the wires of parts in the neighborhood of those to which repairs may be necessary or which are still to be mounted in putting together the apparatus.

The great reduction in the dimensions of the blocks 8, forming the contact-field of the apparatus, allows of a very rapid operation on a field so reduced by means of the stylus, the simple contact of which, however gently applied to any of the blocks 8, is sufficient to produce an unfailing effect—owing to the interposition of an electromagnet—on the operating-lever, which is thus made to swing always through an equal angle and produce an even pressure, an effect which can never be obtained by hand acting directly on the keys of the board.

It is evident as regards type-writing or like machines that it would be easy to transform or arrange their keyboards in such a manner as to conform to the principles described above and on which this apparatus is constructed and worked. Thus the levers of the keys of such keyboards may be directly combined with the corresponding electromagnets, which in such a case would be placed below the keyboard, so as to attract the keys directly, and thereby produce the desired effect.

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

1. Apparatus for use in connection with type-writing and similar machines comprising a frame, a desk supported on the frame and provided with a series of electrically-conducting character-blocks insulated from one another a corresponding series of electromagnets arranged below the desk connected to the character-blocks, armature devices in connection with said electromagnets operating the keys of the type-writer or similar machine and a stylus with an electrically-conducting point the said armature devices comprising levers pivoted intermediate their ends, one end of each lever lying immediately beneath the core of an electromagnet while the other end lies above the key to be operated, conductors connected to the source of electricity, a switch device and a series of contacts, a series of electromagnets, armature devices in electrical connection therewith operating keys of similar characters but different formation from those of the first series of keys substantially as described.

2. Apparatus for use in connection with type-writing and similar machines comprising a desk provided with a series of electrically-conducting character-blocks insulated from one another a corresponding series of electromagnets connected thereto armature devices in connection with said electromagnets operating the keys of the type-writer or similar machine, a stylus with an electrically-conducting point, conductors and a switch device connected to the source of electricity, a series of contacts, a series of electromagnets, armature devices in electrical connection therewith operating keys of similar characters but different formation from those of the first series of keys and a switch on the stylus for bringing into operation one or other of the electric circuits substantially as described.

3. In apparatus of the kind described a removable desk provided with a series of electrically-conducting character-blocks, insulated from one another, a corresponding series of plates 17 separated and insulated one from the other, in combination with a frame adapted to support the desk, a series of plates 19 insulated from the frame and one from the other, the plates 19 corresponding with and adapted to be brought into electrical contact with the plates 17 when the desk is in operative position on the frame, and conductors adapted to place the various plates in electrical connection with the character-blocks.

4. In apparatus of the kind described a switch device for bringing into circuit one or other of the series of electromagnets and comprising a magnet, two bars arranged opposite to each other and each carrying a series of contact-plates, conductors connecting the contact-plates to their respective intermediate contact-plates, character-blocks on the desk connected to the intermediate contact-plates and a third bar provided with contact-fingers, a pivoted armature carrying said contact-finger plates and conducting-wires leading from said electromagnets to a source of electricity and to the stylus substantially as described.

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

JULES LAGARDE.

Witnesses:
JEAN ROBELET,
ACHILLE MARILLIER.