C. L. DRIESSLEIN.

Type-Writing Machine.

No. 220,356. Patented Oct. 7, 1879.

Fig. 1.

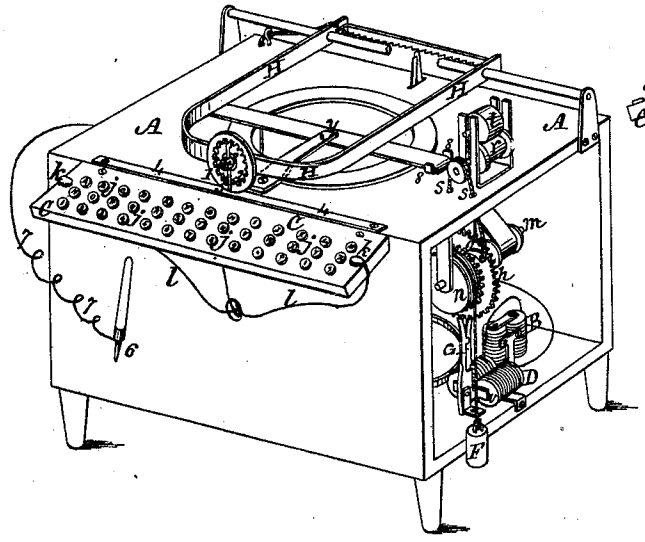


Fig. 2.

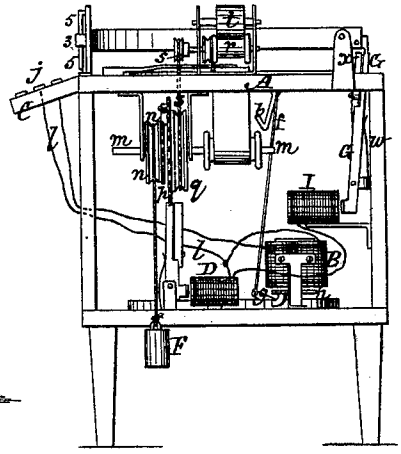


Fig. 3.

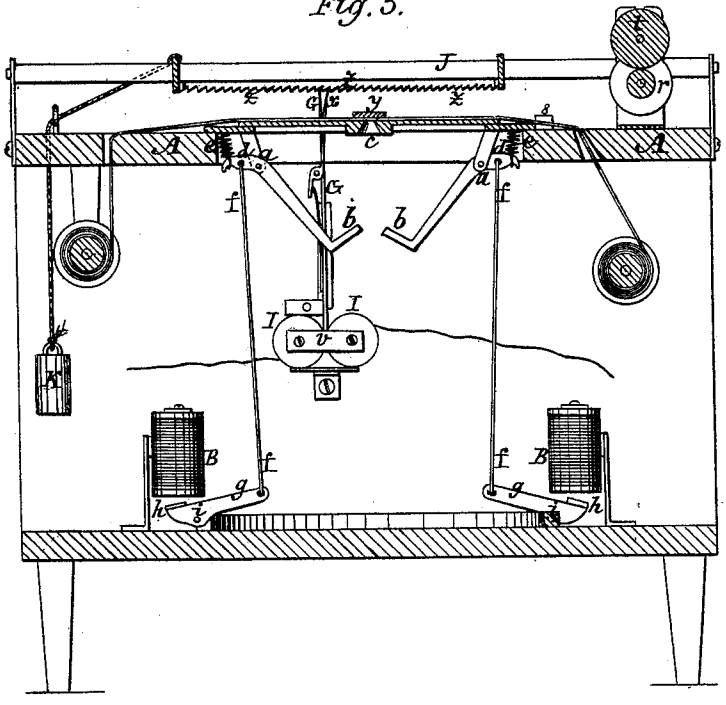
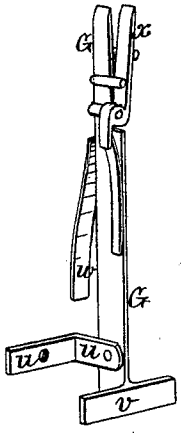


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES L. DRIESSLEIN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN TYPE-WRITING MACHINES.

Specification forming part of Letters Patent No. **220,356**, dated October 7, 1879; application filed December 16, 1873.

To all whom it may concern:

Be it known that I, CHARLES L. DRIESSLEIN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents in perspective so much of a type-writing machine operated by electro-magnetism as will illustrate my invention. Fig. 2 represents an end view of the same. Fig. 3 represents a longitudinal vertical section through the machine, shown on a somewhat larger scale. Fig. 4 represents, detached from the machine and on an enlarged scale, a portion of the escapement mechanism for feeding the inking-ribbon and the paper to and past the printing-point.

This invention relates to a type-writing machine in which electro-magnetism is used as the power or motor for operating the type-levers, the inking and paper-feeding apparatus, as will be explained.

To a table or stand, A, are hung, as at *a*, a series of letter or figure levers, *b*, (two only being shown, but of which there should be one for every letter, figure, word, or mark used in ordinary writing or printing, (said levers being so arranged around a common center as that when raised or thrown up their letter or character ends shall all strike a certain central point, or be guided to such central point by a conical guide at *c*, which would direct said letter-lever *b* to its true position, where it is slightly out of radial line. Behind the pivotal points of the letter-levers there is a short arm, *d*, to the extreme ends of which are connected retracting-springs *e*, to quickly draw down their special letter-lever after it has been thown up to make its impression or imprint upon the paper that is fed past the printing-point, as will be hereinafter explained; and to the short arms *d* of these levers *b* are connected a rod, *f*, which extends down and is attached to a lever, *g*, pivoted at *i*, and on the remote end of which there is an armature, *h*, that works in connection with an electro-magnetic coil, B, as the magnetic current is closed or broken in the usual way. There is, of course, a coil or electro-magnet for each and every letter, figure, or character used, and they are arranged in circular form around the under portion of the table or stand just as the letter-levers are at the upper portion thereof, as in this form the levers and their armatures may be more readily connected.

On a tablet, C, at the front of the table or stand A are arranged on insulated metallic plates or pieces *j*, the letters of the alphabet, figures, marks, or characters, such as are ordinarily used in type-writing machines, which may be of different sizes, so as to be more readily seen or found, and each one of these plates or pieces is represented by and connected with a lever, *b*, having a corresponding letter, figure, mark, or character upon it; and upon this tablet also there are one or two metallic plates, *k*, which connect by wires *l* with the electro-magnets D, which, through an armature, escapement, and paper-feeding mechanism, as will be hereinafter explained, move the paper to make the necessary space between the words. Each one of these pieces or buttons *j* is connected by a wire with a magnet that, through an armature, operates its special letter-lever *b*.

The operator, with a small hammer or platina pointer, 6, insulated in his hand, and to which a wire, 7, connected with one of the poles of the battery, is attached, touches any one of the buttons *j*, a circuit is instantly made, and the armature, magnet, and letter-lever corresponding to that button is instantly actuated, making its impress upon the paper. So, too, if the plates or buttons *k* be touched, the paper-feeding mechanism will be worked, and the paper fed along sufficiently far to space the words written.

The magnets of the letter-levers are connected with the magnets of the inking-ribbon and paper-feeding mechanism, so that every time a letter is printed the ribbon and the paper will be fed to make the proper space between the letters, while the space between the words is made through the plates or buttons *k*, as above mentioned.

The inking-ribbon and paper-feeding mechanism is worked as follows: On a shaft, *m*, there is a drum, *n*, upon which a cord attached

to a falling weight, F, is wound. Upon this same shaft *m* there is a cogged wheel, *p*, to which a pawl, *o*, is attached, said pawl acting in a ratchet-wheel on the drum *n*, so that said drum may be turned to wind up the weight and cord and allow the unwinding to drive the gear-wheel *p*. There is also attached to said shaft *m* a pulley-wheel, *q*, over and around which and around a pulley on the axis of the paper-winding roller *r* an endless belt or band, *s*, passes to wind up the paper and draw it past the printing-point. Over the paper-roller *r* there is a friction-roll, *t*, which aids to lay and hold the paper to the roller *r*.

The falling weight F drives the inking-ribbon and paper-feeding mechanism; but this power and motion are only given and used as each letter is printed and as each word is completed, so that there must be an escapement arranged to let off and regulate this feed just as fast and no faster than the printing is done; and it is done as follows: G (better seen in Fig. 4) is a lever pivoted to a stationary arm, *u*, and having at its lower end an armature, *v*, that is actuated through the electro-magnet D in one direction, and by a spring, *w*, in the opposite direction when the electric current is broken. The upper end of this lever is furnished with a pivoted and spring dog, *x*, which acts, in concert with the stationary or rigid part of said lever, to make an escapement for the feeding mechanism, as these two parts are vibrated through between the cogs of the wheel *p* by the closing and breaking of the circuit through the magnetic coil D. When the force of the driving-weight F is upon the yielding tooth or dog *x*, that tooth moves with the wheel until it becomes flush with the rigid tooth or dog, (which is a part of the lever G itself,) when the vibration of the lever through its armature carries the spring-tooth beyond and the rigid tooth into or between the cogs. The spring-tooth, the moment it becomes free, springs away and into position to catch the next succeeding cog of the wheel as the lever again is vibrated by its armature and closed current. So the wheel *p* is allowed to turn a cog at a time, and as often as the armature is attracted to and withdrawn from its magnet.

Over the printing-point above the cone *c* is a pad, *y*, against which the ribbon and paper are pressed by the stroke of the letter-lever *b* when the latter is thrown up; and duplicates of the writing may be made at one and the same operation by arranging duplicate inking-ribbons and strips or sheets of paper over the printing-point.

The ribbon rolls or spools may be interchangeable to wind from one onto the other; or the winding mechanism may be duplicated, one at each end, to wind the ribbon back and forth.

As above described, the machine is shown as arranged for printing on a narrow strip of paper; but it is equally applicable to the printing upon sheets of paper, in which latter event the sheet or roll of paper is connected to or with a frame, H, arranged to be moved over the top of the table A by a magnet or coil, I, and an armature and escapement-lever, as seen in Fig. 4, working in a toothed rack or ratchet, *z*, attached to said frame H, and moved along on the rod or way J by a falling weight, K, but by defined and regulated distances or spaces through the escapement-lever and rack.

In front of the frame H, so as to be easily observed by the operator, is a mechanism for indicating the moving of the paper back if at any time the wrong letter may have been printed, and so that the correct letter may be printed over the wrong one. This mechanism consists of a wheel, 1, having an internal gear, 2, and turning upon a hub or journal, 3, rigidly affixed to the frame H, and this wheel may run upon a plate or way, 4, on the table, to relieve the friction of the frame and the paper upon it. Through the fixed hub or journal is passed an indicator, 5, the top of which has a projection, Fig. 2, that can be pushed inward and between the cogs of the gear 2, so that while the point of the indicator may show on the plate 4 where the last letter or the wrong letter was printed, the clicking of the head of the indicator as the cogs pass it may designate exactly the distance the paper is turned backward to bring the incorrect letter over the printing-point, and then the correct letter is printed over it. When not required the indicator-head may be moved away from the cogs by drawing it outward, it being so arranged as to admit of this movement.

The spacing between the letters and between the words I have described. The movement of the paper to space between the lines is made by well-known mechanism, which I have not shown, as I may adopt such as I find most suitable for that purpose.

It is obvious that, instead of putting the armatures of the letter-levers below their coil or magnet and connecting them to a pivoted lever, and thence by the rod *f*, the armature may be arranged over or above the magnet or coil, and be connected directly to the letter-lever, and so dispense with the pivoted lever; but I prefer the plan I have shown.

So, too, instead of closing the connection or circuit of electricity or electro-magnetism by means of a hammer or pointer in the hand of the operator, the same operation and effect can be accomplished by allowing the buttons or the keys to be moved to so close and break the circuit. I have described and shown, however, the plan which I regard as most simple. Others might prefer a key-board, either being equally applicable to the operation of the machine in closing or breaking the circuit. The wire from one pole of the battery connects directly with the magnet of the ink-ribbon and paper-feeding mechanism, and this magnet is connected by wire with the letter-lever magnet, and thence by wire to the letter-tablet; and the pointer is connected by a wire with the other pole of the battery.

In Fig. 1, at 8, is shown a movable and ad-

justable ribbon-guide, by means of which the inking-ribbon throughout its width may be used.

I am aware that type-levers operated by the armature of electro-magnets have been used before; and I do not claim, broadly, the use of such devices in electric type-writing machines.

I am also aware that escapement mechanisms have been used in printing-telegraphs for feeding the paper and the inking-ribbon, and I do not claim, broadly, the use of an escapement mechanism for such purpose; but

What I claim is—

1. In a type-writing machine, the combination of the magnet D, armature *v*, escapement G, and inking-ribbon and paper-feeding mechanism, for the purpose of operating said mechanism by the closing and breaking of the electric current, substantially as shown and described.

2. In combination with a series of letter-levers, *b*, radially arranged around a common printing-center to stamp or imprint their letter or character there, the hollow conical directrix *c*, for guiding the letter ends of said levers to the exact printing-point, substantially as described.

3. In combination with a series of buttons having letters, figures, or characters thereon, and connected each to its special magnet or coil by a separate conducting-wire, and a corresponding series of levers with corresponding letters, figures, or characters thereon, a pointer or electric conductor, 6, connected to or with the battery by a conducting-wire, 7, for making or breaking the circuit by simply touching said buttons and working their respective letter-levers *b* by means of armatures *h*, as and for the purpose described.

4. In combination with a magnet or coil and with an escape wheel or rack, the pivoted escape-lever G, with its armature *v* and pivoted spring dog or arm *x*, for controlling the feeding of the paper and of the inking-ribbon through the closing or breaking of an electric current through said coil or magnet, arranged substantially as shown and described.

5. The combination of the wheel 1, indicator 5, and plate 4, for the purpose of indicating the distance that the paper is moved back when it becomes necessary to print the correct letter upon an incorrect one unintentionally printed upon the paper, as described and represented.

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Witnesses:
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W. E. VIGUS.