

No. 765,960.

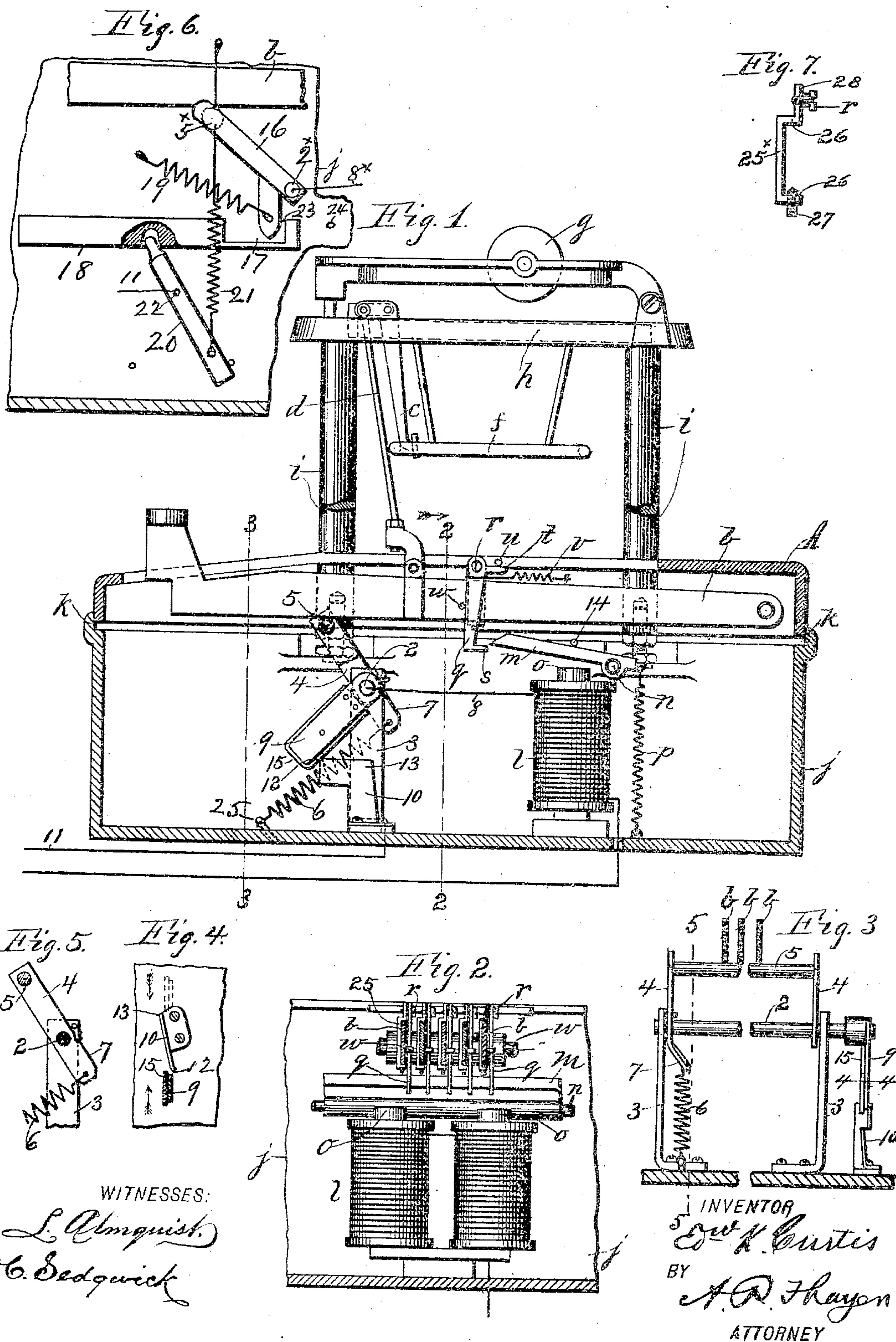
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E. K. CURTIS.

# ELECTROMAGNETIC TYPE WRITING MACHINE ACTUATING MECHANISM.

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NO MODEL.





# UNITED STATES PATENT OFFICE.

EDWARD K. CURTIS, OF NEW YORK, N. Y., ASSIGNOR OF TWO-THIRDS  
TO SYDNEY H. CARNEY, OF NEW YORK, N. Y., AND WILLIAM WATT,  
OF ELIZABETH, NEW JERSEY.

## ELECTROMAGNETIC TYPE-WRITING-MACHINE-ACTUATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 765,960, dated July 26, 1904.

Application filed December 15, 1903. Serial No. 185,189. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD K. CURTIS, a citizen of the United States of America, and a resident of the borough of Brooklyn, New York city, State of New York, have invented certain new and useful Improvements in Electromagnetic Type-Writing-Machine-Actuating Mechanism, of which the following is a specification.

My invention relates to an attachment for type-writing machines, of electromagnetic means for actuating the keys in a way to relieve the operator of the principal part of the labor, and to attain more rapid action and greater uniformity in the impressions, the attachment being such that the machine may be operated either with the aid of the electric means or in the ordinary manner without such aid and being adapted for operative connection of the electric means simply by placing the type-writing machine on the attachment.

The essential feature of the invention consists of means whereby the operation of all or any plurality of the key-levers being first slightly depressed individually by the operator will be completed by a single electromagnet located under the key-levers.

The invention also comprises other minor features of details of the apparatus, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 represents a vertical section of parts of a type-writing machine parallel with the key-levers also of the apparatus of my invention. Fig. 2 is a detail in transverse section on line 2 2 of Fig. 1. Fig. 3 also represents details in transverse section on line 3 3, Fig. 1. Fig. 4 represents a detail in plan view with a part in section on line 4 4 of Fig. 3. Fig. 5 is a detail in section on line 5 5 of Fig. 3. Fig. 6 is a detail showing a modified form of contact apparatus that may be employed in the electric circuit. Fig. 7 is a detail showing a clamp for connecting a hook to a key-lever for clearer illustration.

A represents the base, *b* one of the key-levers, *c* type-levers, *d* a connecting-rod, *f* the type-lever-retaining crib, *g* the impression-

roller, *h* the top frame, and *i* the supporting-posts, of a type-writing machine of common form.

The base A is seated on a chambered sub-base *j*, as shown at *k*, in which I have placed an electromagnet *l* in upright position, preferably about midway of the lateral dimension of the base and somewhat rearward of the median transverse vertical plane of the base. Said magnet is provided with an armature-plate *m*, reaching the entire lateral range of the key-levers or as many of them as it is desired to actuate by the one electromagnet, preferably the whole, said armature being mounted at its respective ends on pivots *n* for its operation under the influences of the pole-pieces *o* of the magnet when energized, and a retracting-spring *p* of any kind, said armature being located about as close under the key-levers as will permit it to swing vertically without interference therewith. The magnet may, however, be arranged horizontally.

Each key-lever carries a pendent hook *q*, pivoted at *r*, so as to swing slightly toward and from the free edge of the armature and having a point *s* reaching slightly below said edge when the parts are in the normal positions.

From the upper end of each hook a lateral arm *t* projects under a stop-pin *u*, which being fixedly supported normally prevents hook *s* from engaging the edge of the armature, and a spring *v* forces said hook *s* forward under the edge of the armature promptly when slight initial movement of the key-lever is given by the operator, and the hook is thereby depressed slightly with relation to stud *u*, while a stop-stud *w* on the key-lever behind the hook limits it against unnecessary back movement. At the moment the hook thus engages the edge of the armature the contacts of the electric circuit are closed, the magnet is energized, and the armature being thereby attracted by the magnet completes the movement of the key-lever and relieves the operator of the principal part of the labor of working the key-lever. The means of effecting the closing of the contacts may be va-



riously contrived. What I have chosen in the present instance preferably consists of a rock-shaft 2, mounted in supports 3 transversely of the subbase *j* at a suitable distance below the key-levers and carrying in suitable upwardly-inclined arms 4 a transverse bar 5, which bears against the under edges of the key-levers through the influence of a spring 6, connected with an arm 7 of said shaft 2.

10 This shaft 2 is connected with one of the magnet-wires 8 and carries, preferably at one end, a platinum arm 9, with which an insulated contact spring-plate 10, having the return-wire 11 connected to it, is so arranged

15 that when the initial depression of a key-lever is effected by the operator contact is made at 12, and the magnet is energized and at once completes the full movement of the key-lever set in motion by the operator.

20 Before the completion of the movement of the key-lever contact-arm 9 escapes from contact-spring 10 at 13, breaking the circuit. The key-lever is then returned to its normal position by the usual spring of the type-

25 writing machine, (not shown,) causing hook *q* to be released from the armature by contact of its arm *t* with stud *u*, and the spring *p* returns the armature to its normal position, to which its movement is limited by a stop 14.

30 The contact-spring 10 ranges obliquely to the traverse of arm 9, as shown in Figs. 3 and 4, so that in the forward movement when contact is to be made said arm rubs against the spring to make good contact, at the same time pressing it sidewise, so that

35 after escaping from said spring at 13 the recoil of the spring allows arm 9 to return on the reverse side of the spring, presenting its reverse side thereto, and this side is insulated

40 by a non-conducting surface 15, preventing electrical contact in the return movement. (See Fig. 4.) Thus one electric circuit and one magnet, with the prolonged armature and the hook attachments of the respective

45 key-levers, serve for operating all the key-levers and afford simple and inexpensive auxiliary actuating apparatus; but a plurality of electromagnets, each operating a group of key-levers, may be employed.

50 In Fig. 6 I represent a modified form of contact apparatus that may be employed in the electric circuit, which consists of the elbow-lever 16, mounted on the rock-shaft 2<sup>x</sup> and in one end carrying one end of bar 5<sup>x</sup>,

55 bearing against the under edges of the key-levers, and the other arm playing in the notch 17 of the sliding contact-piece 18 and having a spring 19, maintaining said bearing with the key-lever, said shaft 2 having wire 8<sup>x</sup> connected same as in the other arrangement. A

60 shifting-lever 20 and actuating-spring 21 are provided for effecting certain shifting movements of the sliding contact, said lever being pivoted at 22 and thereat connected with the

65 circuit-wire 11.

It will be seen that normally there is no contact between the pendent arm of lever 16 and the sliding contact 18; but slight initial downward movement of the key-lever causes contact between them at 23 and effects complete operation of the key-lever through the energizing of the magnet, as before stated. The full movement of the key-lever shifts the sliding contact-piece over so far toward the stud 24 that spring 21 is shifted past pivot 22

75 and thrusts in the opposite direction, parting the contacts at 23 and breaking the circuit, and when the key-lever rises spring 19 returns shaft 2 to its normal position and also shifts lever 20 until the reverse thrust of

80 spring 21 returns slide 18 to its normal position, as shown in the drawings. In this example of my invention the hooks are attached to the key-levers by a clamp consisting of a flat bar 25<sup>x</sup>, having shoulders 26 on one side,

85 between which the key-lever fits with a set-screw 27 set in one of the shoulders to be screwed against the edge of the lever, and thus secure the bar on the key-lever, said bar having a vertical extension 28 above the key-

90 lever, on which the hook-pivot is mounted.

The manner of attaching the hook-carrying pivot may of course be varied in different ways, and I do not limit myself in this respect, but prefer such contrivance of the same

95 as will enable the connection to be readily made to the key-levers of a machine which is in complete operative condition, so that my attachment may be applied to machines in use which I effect with this means of connection;

100 but any other approved means of connecting the hooks may of course be employed.

It will be seen that the hooks of the key-levers are so placed on them that when the type-writing machine is placed in position on

105 the subbase said hooks are so gaged by the seating at *k* as to occupy the proper position with relation to the armature for coacting therewith, as described, and the bar 5 of the contact apparatus is so positioned that the

110 key-levers range over it in the proper relation for actuating it, as required for making the contacts. Thus operative connection of the electric actuating apparatus with the type-

115 writing machine is made simply by placing the said machine in position on the subbase, and as the type-writing machine may be operated in the ordinary manner without the actuating apparatus any approved device may

120 be provided to hold the contact apparatus out of gear when it may be so desired, or it may be effected by unhooking spring 6 from its stud 25 and swinging bar 5 down to or slightly below the range of the key-levers, in which

125 position it will be maintained by the conflict of contacts 9 and 10.

If the circuit be opened by a switch, or in case the use of the machine is wanted when electric power is not available, the ordinary manual operation may be proceeded with

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whether the contact apparatus be so engaged or not.

The hook attachments to the key-levers make no hindrance to the ordinary manual operation of the key-levers.

I do not claim, broadly, electromagnetic means located under the key-levers in a base attachment for type-writing machines and connected with the key-levers for operating them.

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

1. The combination with a type-writing machine, of a subbase attachment thereto, an electromagnet located thereon and being in electric connection with a suitable source of electric energy, an armature of said magnet adapted for connection with a plurality of the type-writing-machine key-levers individually, and means connecting such armature with such plurality of levers, whereby any individual key-lever being initially set in motion by the operator will be further actuated by the magnet.

2. The combination with a type-writing machine, of a subbase attachment thereto, an electromagnet located thereon and being in electric connection with a suitable source of electrical energy, an armature of said magnet adapted for connection with a plurality of type-writing-machine key-levers individually, and means whereby any key-lever individually initially depressed by the operator will be automatically connected with the armature and be further actuated by the magnet.

3. The combination with a type-writing machine, of a subbase attachment thereto, an electromagnet located therein and being in electric connection with a suitable source of electric energy, an armature of said magnet extending along the range of a plurality of the key-levers of the type-writing machine transversely and adapted for connection with a plurality of said key-levers, a hook on each key-lever and means whereby the hook of any key-lever individually depressed by the operator will be automatically engaged with the armature and said key-lever will be further actuated by said magnet.

4. The combination with a type-writing machine, of a subbase attachment thereto, an

electromagnet located thereon and being in electric connection with a suitable source of electric energy, an armature of said magnet extending along the range of a plurality of the key-levers of the type-writing machine transversely and adapted for connection with a plurality of said key-levers, a hook on each key-lever for engagement with the armature when the key-lever is initially depressed by the operator, a spring for effecting such engagement for further operation of the key-lever by the magnet, and a stud for effecting disengagement of said hook when the key-lever retires and maintaining such disengagement while other key-levers are in operation.

5. The combination with a type-writing machine, of a subbase attachment thereto, an electromagnet located thereon, an armature of said magnet adapted for connection with a plurality of the type-writing-machine key-levers individually, means connecting such armature with said levers and means connecting the electromagnet with a suitable source of electricity consisting of the moving contact of the electric circuit adapted to be actuated by any individual key-lever when depressed, and the stationary contact of said circuit adapted for the making and breaking of the circuit in the forward traverse of the moving contact.

6. The combination with a type-writing machine, of a subbase attachment thereto, an electromagnet located thereon, an armature of said magnet adapted for connection with a plurality of the type-writing-machine key-levers individually, means connecting such armature with said levers, and means connecting the electromagnet with a suitable source of electricity consisting of the rock-shaft carrying the moving contact adapted to be actuated by any individual key-lever when depressed, and the stationary contact of said circuit adapted for the making and breaking of the circuit in the forward traverse of the moving contact.

Signed at New York this 10th day of December, 1903.

EDWARD K. CURTIS.

Witnesses:

WM. WATT,

C. SEDGWICK.