E. HAUSBERG.

ELECTRICALLY OPERATED TYPEWRITER.

APPLICATION FILED MAR. 11, 1916.

1,328,736.

Patented Jan. 20, 1920.

4 SHEETS—SHEET 1.

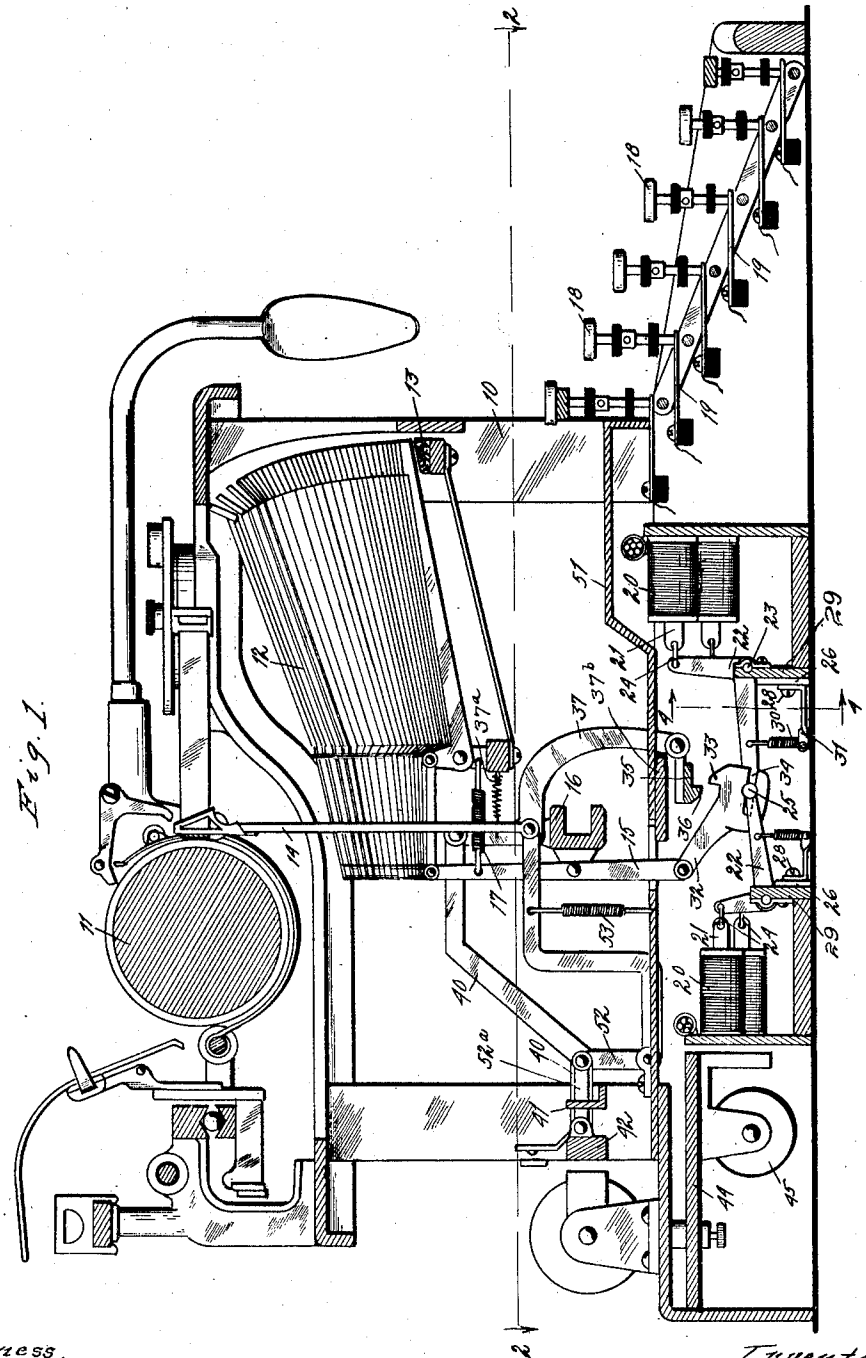


Fig. 1.

Witness.
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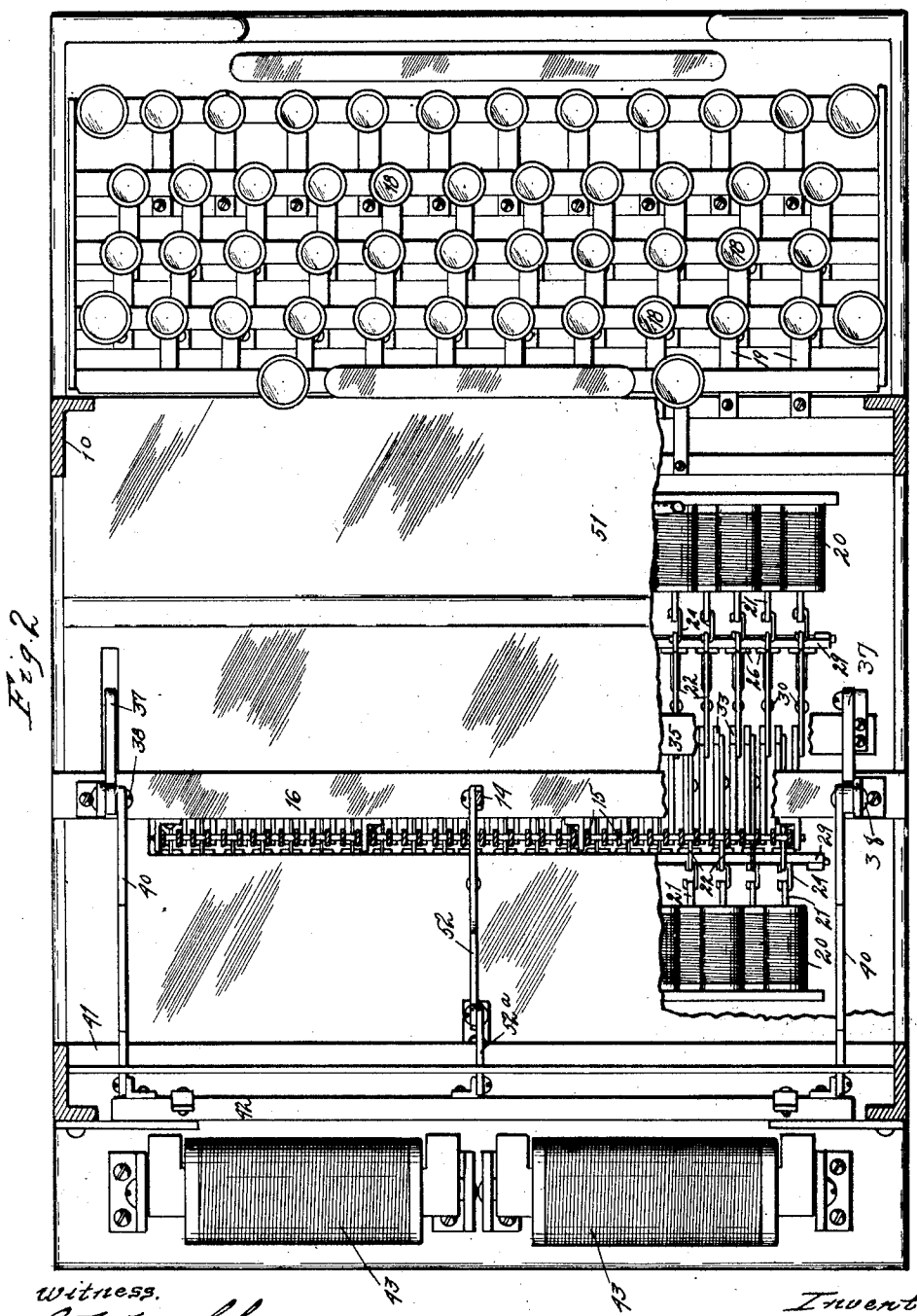


Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 4.

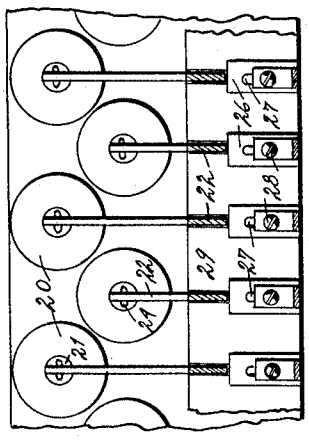


Fig. 5.

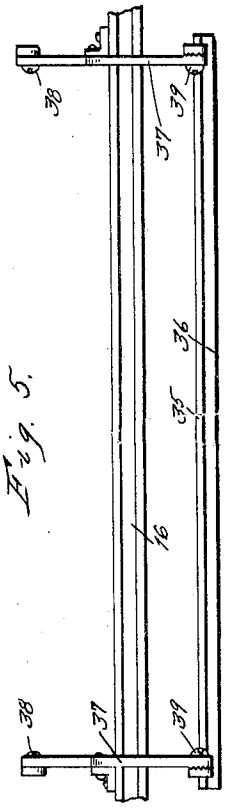
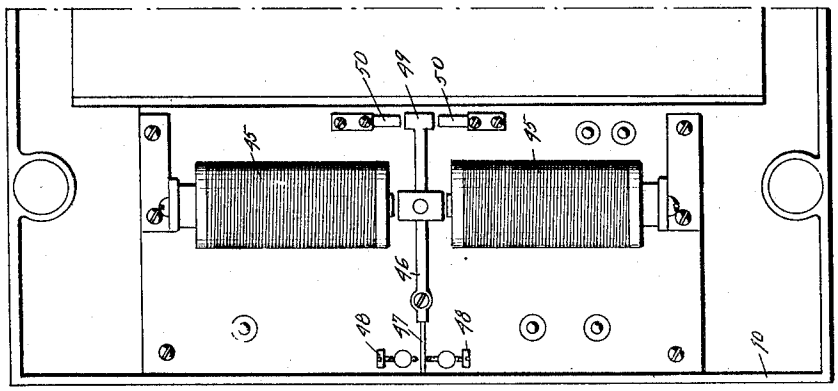


Fig. 3.



Witness.
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4 SHEETS—SHEET 4.

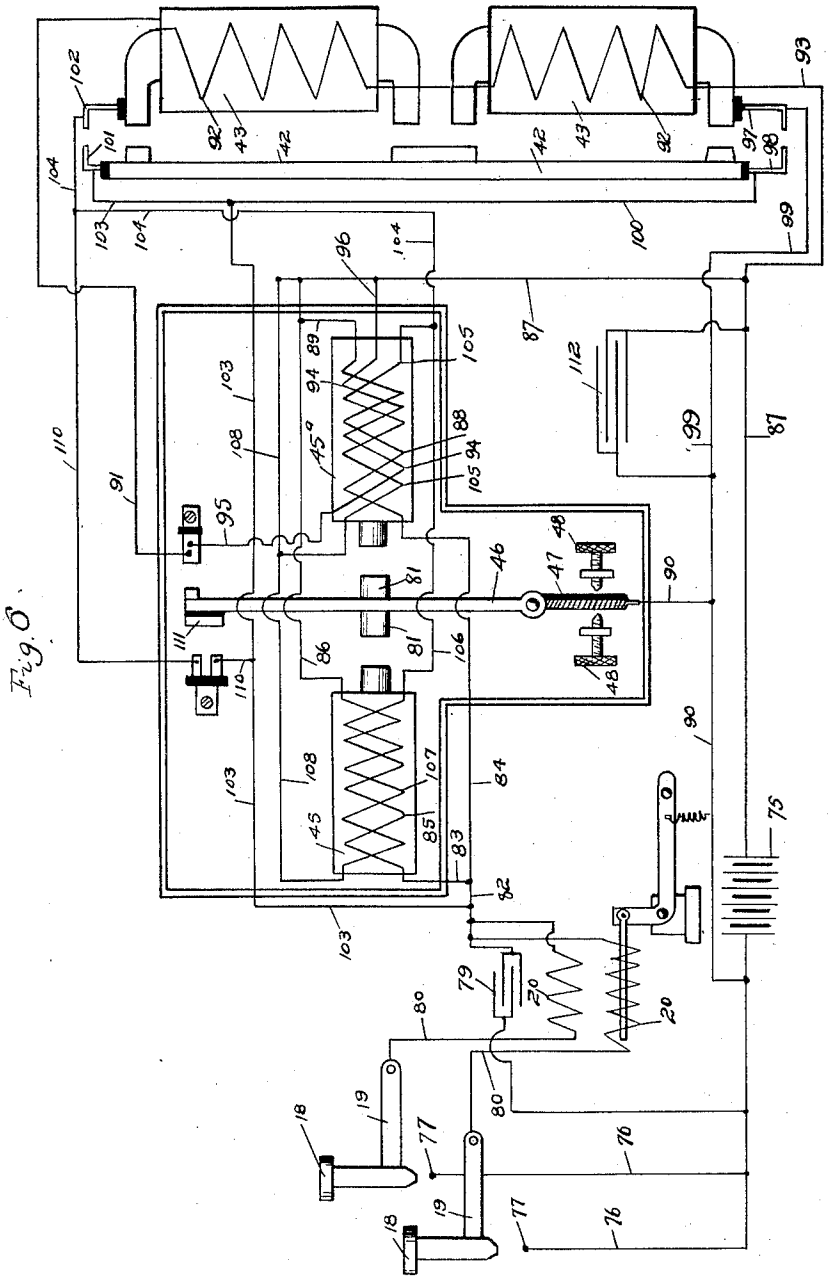


Fig. 6.

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UNITED STATES PATENT OFFICE.

ERNEST HAUSBERG, OF CHARLES CITY, IOWA.

ELECTRICALLY-OPERATED TYPEWRITER.

1,328,736. Specification of Letters Patent. Patented Jan. 20, 1920.

Application filed March 11, 1916. Serial No. 83,567.

To all whom it may concern:

Be it known that I, ERNEST HAUSBERG, a citizen of the United States, and resident of Charles City, in the county of Floyd and State of Iowa, have invented a certain new and useful Electrically-Operated Typewriter, of which the following is a specification.

My invention relates to and consists in certain improvements in electrically operated typewriters of the class illustrated and described in the application of Paul C. Rawls for United States Letters Patent Serial Number 811,103.

One of the objects of my invention is to provide electrically actuated devices so constructed as to be readily incorporated in, or applied to, a typewriter of the design usual in finger operated machines.

In the accompanying drawings I have illustrated the parts of one of the typewriters now in common use and known generally to the trade as the "L. C. Smith" typewriter, and have shown my electric operating devices applied thereto with a minimum of modification or change in the ordinary L. C. Smith finger operated typewriter.

A further object is to provide an improved construction, arrangement and combination of the various parts of the electric operating devices with relation to each other and particularly with relation to the ordinary parts or elements of the finger operated typewriter.

A further object is to provide simple, durable and inexpensive means whereby, upon the universal operating armature being attracted to its magnet, the ribbon supporting device will be moved to project the ribbon to printing position, and upon said armature moving away from its magnet the ribbon supporting device will be moved so as to withdraw the ribbon from printing position.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a vertical, longitudinal, central, sectional view of a typewriter embodying my invention.

Fig. 2 shows a top or plan view of the same, parts being broken away to show the interior construction.

Fig. 3 shows an inverted, plan view illustrating the electric switch device for controlling the universal operating electromagnet.

Fig. 4 shows an enlarged, detail, sectional view on the line 4—4 of Fig. 1.

Fig. 5 shows a detail, edge view of the universal operating bar and its supporting arms, and

Fig. 6 illustrates diagrammatically the electrical connections of my improved typewriter.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate generally the stationary parts of the frame of the typewriter. Mounted upon the frame is the movable platen 11. The type bars are indicated by the numeral 12, and are arranged to swing from the stationary support 13 to printing position relative to the platen. The vertically movable ribbon support is indicated by the numeral 14. Each type bar is connected to a type bar operating lever 15, which levers are fulcrumed to a stationary supporting bar 16.

The arrangement of these parts in the ordinary L. C. Smith typewriter is such that the type bars are extended across the machine from side to side, bearing a curved relation to each other, whereby the movement of each type bar from its position at rest to printing position on the platen, is substantially of the same length. The fulcrum bar 16 is also curved upwardly at its ends so that the lower ends of the type bar operating levers 15 may all stand in substantially the same horizontal plane near the bottom of the machine, and the same length of movement given to the lower end of each type bar operating lever will result in giving to each corresponding type bar the same kind and length of stroke. In this connection I have provided means for accelerating the return movement of the type bars by adding to each type bar operating lever 15 at its upper end, a contractible coil spring 17 attached to a stationary support and tending to exert its pressure in returning the type bars to normal position after they have contacted with the platen.

In order to utilize the above described parts of an ordinary typewriter, and also the parts not particularly mentioned but

necessarily associated therewith, and at the same time to apply my improved electrically operated devices thereto, I have provided the following construction and arrangement of the electrically operated parts. The key levers which in an ordinary typewriter are usually arranged near the base and extend from the front to a point near the rear of the machine, are omitted and instead of the key levers the keys 18 are provided, which are arranged to move up and down and when down to form an electric contact by means of a conductor spring 19. Under the central portion of the machine I arrange the selective magnets. These magnets are arranged in two series and are preferably of the solenoid type with the armatures slidingly mounted in the hollow magnets. The selective magnets are indicated by the numeral 20, and their armatures by the numeral 21.

Bell crank levers 22 are arranged in two rows on opposite sides of a transverse line through the center of the machine and are mounted upon the bearing rods 23. The upper end of each bell crank lever is connected by a link 24 with its corresponding selective armature, and the lower end is provided with a laterally extending arm 25 for purposes hereinafter made clear.

In order that the downward movement of the lower end of each of said bell crank levers 22 may be limited and the amount of such movement accurately controlled for each individual bell crank lever, I have provided an adjustable stop 26 for each bell crank lever. This stop is provided with a slot 27 and a set screw 28 which is passed through the slot and into a stationary support 29. In order to accelerate the downward movement of the lower end of each bell crank lever 22, I have provided a contractible coil spring 30 for each of the bell crank levers. The lower end of this spring is connected to a bracket 31, and said brackets are supported and held in place by the set screws 28, so that by the adjustment of any one of the set screws 28 I may control not only the downward movement of the bell crank lever, but also the tension of the spring applied thereto.

In machines of this kind when any selective magnet is energized, it is desirable to cause it to move an element to position for being engaged by a universal bar for operating the corresponding type bar. For this purpose I have provided a series of hooked levers 32, one for each type bar operating lever. These hooked levers 32 are pivoted to the lower ends of the corresponding type bar operating levers, and each is provided near its opposite end with a hook 33 and near its lower portion with a slot 34. The said slot is designed to receive the lateral projection 25 of the corresponding bell crank lever 22. By means of the foregoing arrangement it will be seen that when any selective magnet is energized, the lower end of the corresponding bell crank lever 22 will be elevated and the hook 33 will be raised. After this hook is raised, it will be seen also that the hook may be moved horizontally without moving the bell crank lever, because of the slotted sliding connection between the hooked lever 32 and the bell crank lever 22.

The universal operating bar is extended transversely across the machine directly above the hooks 33, and is indicated by the numeral 35 and has a hook 36 to coöperate with the hook 33. It is supported upon two levers 37 which are fulcrumed at 38 to a stationary support. A spring 37^a is provided for normally holding the universal operating bar at its rearward limit of movement, as shown in Fig. 1. The rearward movement of this universal operating bar is limited by the stop device 37^b, as shown in Fig. 1. The connection between the operating bar 35 and its levers 37 is made adjustable by means of the set screws 39, so that the universal operating bar may be raised or lowered at its rear edge relative to the levers 37. Connected to the upper ends of the levers 37 above their fulcrumed points, are the links 40 which are slidingly mounted at their rear ends in the guides 41 and are connected to the armature 42 of the universal operating magnet. By this arrangement it is obvious that when one of the hooked levers 32 has been elevated by its selective magnet, it will be in position to be engaged by the hook 36 of the universal operating bar. Then when the armature 42 is moved rearwardly, the universal operating bar 35 will move forwardly and carry with it the hooked lever 32. This will cause the corresponding type bar to be moved to printing position.

The universal operating magnet, or power magnet, is indicated by the numeral 43, and is preferably mounted at the rear of the machine frame in position adjacent to the armature 42, so that when energized this armature will be attracted to the magnet and moved forwardly.

The electrical connections of my invention are illustrated particularly in Fig. 6, in which the reference numeral 75 illustrates a battery or other source of electrical energy, which is connected by the wires 76 to the contact points 77 beneath the keys 18. Each key rests upon a conducting spring 19, which is adapted when the key is depressed to make an electrical connection between the contact point 77 and said spring. A condenser 79 is preferably provided between the conductor 76 and the conductors leading from the spring 19 for the purpose primarily of preventing sparking. In the diagram illustrated in Fig. 6, the selective

magnets 20 are illustrated by coils, which are connected by conductors 80 with the springs 19.

During the operation of writing on a machine of this kind, it sometimes happens that a key is depressed only for a very short space of time and it sometimes happens that an operator permits his finger to rest upon a key for a comparatively long time.

It is desirable in a machine of the class to have the type bar complete its printing stroke even though the depression of the key does not continue during the stroke, and to have the type bar return automatically to its normal position even though the depression of the key continues beyond the time required for the printing stroke. In order to accomplish these objects most effectively, it is necessary: first, that a selective magnet be energized and that the hook 33 be moved into engagement with the universal bar 35 (for which only a momentary depression of the key is necessary); second, that the universal power magnet, which is indicated generally by the reference numeral 43, be energized and a circuit maintained therein for a sufficient length of time to complete the printing stroke of the type bar regardless of whether or not the contact is maintained at the key; and third, that the circuit through the power magnet be broken at the completion of the printing stroke to permit the return of the type bar.

These three general operations just referred to are carried out in my improved machine as follows:

The first operation, that of energizing the selective magnet and thereby raising the hook lever 33, is accomplished by depressing key 18 which closes a circuit through wires 76 and 80, coil 20, and thence through wires hereafter described to the battery.

For performing the second operation, the specific mechanism herein shown and described is as follows:

The numeral 46 indicates a movable switch normally held in a neutral position by a spring 47 capable of moving either rearwardly or forwardly against the spring pressure. Arranged in front of the switch 46 is an electromagnet 45 and arranged in the rear of the switch 46 is another electromagnet 45a. An armature 81 is fixed to switch 46 and is adapted to be actuated by both magnets 45 and 45a. When a contact is made at a key 18, a current will flow from one side of the battery 75 through the conductor 76 to the contact 77, thence through conductor 80, selective coil 20 and conductor 82 and this current will be divided and part of it flow through the conductor 83 and part through the conductor 84. Connected with the conductor 83 is a coil 85 on the magnet 45, which is connected by the return wire 86 and the return wire 87 to the battery 75. The part of the current that goes through the conductor 84 also goes through a coil 88 on the electromagnet 45a and returns through the conductor 89 to the conductor 87 and back to the battery. The said coil 85 is arranged so that it has approximately twice the amount of resistance as the coil 88 so that when both coils are energized, the magnet 45a will overcome the pull of the magnet 45 and cause the switch 46 to move rearwardly. The coil 85 may of course be dispensed with if desired as a single coil 88 will have a similar effect to the double coil arrangement described. When the switch 46 is moved rearwardly a circuit is established from the battery to the power magnet 43 as follows:

A conductor 90 connects the battery with the switch 46 and when the switch 46 is moved toward the rear a circuit is completed through the switch to the conductor 91, which conductor connects to the coil 92 on the power magnet 43, and from the coil 92 the return wire 93 leads to the battery.

It is possible of course that after the key has been depressed and the current passed momentarily through the power magnet, as before described, the key will be released and the circuit broken. In order to insure the completion of the type bar movement, even though the key is released, I have provided a second coil 94 on the magnet 45a, preferably of high resistance, connected to a conductor 95 at one end and to the return wire 96 at the other end, so that instantly upon the movement of the switch 46 to the rear, a circuit is established from the battery through the switch 46 and through this coil 94 to further energize the said magnet 45a and thereby hold the switch 46 rearwardly even though the current through the first coil 88 on the magnet 45a is discontinued. After the establishing of this new circuit through the magnet 45a, the circuit through the power magnet is then maintained regardless of the position of the key and the armature 42 is drawn toward the power magnet.

The universal magnets 45 and 45a and the switch 46 may of course be made as small, and the spring as delicate as desired so that the action of the switch in making the power circuit and the action of the selective magnet in raising the hook will be practically simultaneous.

In order to perform the third operation, to wit: the breaking of the circuit through the power magnet to permit the return of the type bar, I have provided on the power magnet the contact arm 102 and on the power armature a contact arm 101. The contact arm 101 is connected to a conductor 103, which is in turn connected with the conductors 110 and 82, and the contact arm 102 is connected to a conductor 104 which leads

to the coil 105 on the magnet 45ª, which coil is wound on said magnet in a reverse direction from the coils 88 and 94 so that when a circuit is established through this coil 105, it neutralizes the magnet 45ª, thus permitting the spring 47 to move the switch 46 toward the front. This movement of course is assisted by the magnet 45, which has remained partially energized during this entire operation. However, in order to insure the magnet 45 being sufficiently energized to move the switch 46 toward the front, a branch conductor 106 is connected to the conductor 104 and this branch conductor is connected to the coil 107 on the magnet 45, to thereby increase the magnetic power. Coils 105 and 107 are connected by a return wire 108 with the conductor 87, which returns to the battery. Obviously when the switch 46 is thus moved toward the front, the circuit for the power magnet will be broken and the power armature may again move forwardly and the type bar will be returned to normal position.

In order however that these operations may be performed as described, it is of course necessary that when the contact arms 101 and 102 come together, there be an electrical current to be established through them. Whatever current there is must flow through the contact formed at the key. But if the contact at the key has been broken before the contact at 101 and 102 is made, it is obvious that the latter contact will have no effect whatever; the switch 46 will then continue to be held in its rearward position and the power magnet will continue to be energized, with the result that the type bar will be held rigidly against the platen until a key is again depressed. To overcome this difficulty, I have provided that the rearward movement of the power armature shall not only make the contact between the arms 101 and 102, but shall at the same time (or previous thereto) make a second contact to supplement, or take the place of, that at the key. The means described comprises two yielding contact arms 97 and 98, connected respectively with the magnet 43 and the armature 42. The arm 97 is connected by conductor 99 with the battery 75 and the arm 98 is connected by a conductor 100 with the conductor 103, so that, as soon as the armature 42 makes a slight movement toward the magnet, an independent circuit from the battery 75 is set up through the conductors 99, 100 and 103 to take the place of the circuit originally established through the conductor 82 by the depression of a key.

Assuming that even after the movement of the type bar has been completed, the operator still maintains pressure upon the key, obviously it is not desirable that this key contact should result in repeated movements of the same type bar and in order to prevent this I have provided the following devices:

On the switch 46 is a contact plate 111 so arranged that when the switch 46 is at its forward limit a circuit will be established between the conductors 110 and 87, which will result in preventing the circuit established by the depression of the key from moving the switch 46 rearwardly because a circuit will be established through the key and the conductors 19, 80, 103, 110, 104, and 106, through the coil 107 which, in connection with the circuit already established by the depression of the key through the coil 85, will sufficiently energize the magnet 47 to hold the switch 46 forwardly. As soon as the circuit is established through the coil 107, as before described, a circuit will also be established through the reverse coil 105 on the magnet 45ª, thus neutralizing the effect of the other coils on the magnet 45ª. It will be seen that the contact plate 111 simply takes the place of the contact arms 101 and 102. Hence, as long as the key remains depressed, the switch 46 will be at its forward limit and no further operation of the type bar may be made until said key is released, and upon a release of the key all of the circuits are broken and the switch 46 may then return by means of its spring to a neutral position, as shown in Fig. 6. I preferably provide a condenser 112 between the conductors 87 and 99 to prevent sparking at the contacts.

It will be seen from the foregoing description of the electrical connections of my device that I have provided means by reason of the contact between its points 97 and 98 whereby an electrical circuit will be insured through the proper magnets, which in turn are adapted by coacting with the proper armature to break the circuit through the power magnet at the completion of the working stroke of its armature. I have also provided means for preventing the reënergizing of the power magnet until after any key which is depressed at the completion of the working stroke of the power armature shall have been released.

I have also provided means for insuring a current through the power magnet until after the power armature has completed its working stroke so that even though the operator releases the key, the entire operation of printing the letter controlled by such key will be completed if a key has once been pressed down far enough to make a connection between spring 19 and point 77.

The switch 46 is arranged upon the detachable base 44, which is in turn mounted beneath that part of the frame which supports the universal power magnet. By

this construction and arrangement of the switch device it is obvious that the ordinary frame of the L. C. Smith typewriter may be used without change or modification and that the switch is located in such position that it is not likely to become injured or broken.

In order to protect the selective magnet and the other operating mechanism from dust and dirt, I preferably provide a detachable plate 51 having its rear end mounted on the rear of the base of the typewriter frame and its front end connected to the front portion of the typewriter frame. Suitable openings are made in this plate for the type bar operating levers 15 and the levers 37.

I have also provided simple and convenient means for elevating the ribbon guide 14 during the stroke of any type bar and for lowering it immediately after the completion of a type bar stroke, as follows: A bell crank lever 52 is mounted on the typewriter frame, having one end pivoted to the ribbon guide device 14 and the other end pivoted to a link 52^a extended through the guide 41 and attached to the universal armature 42. I also preferably provide a spring 53 for normally holding the ribbon guide downwardly and to assist in the rapid downward movement of it. The arrangement of this ribbon moving device is very simple and inexpensive, because it is connected direct with the links which are necessarily used in this machine for imparting movement from the universal armature to the type bar levers.

In practical use, it is obvious that in the manufacture of my improved typewriter I am enabled to employ practically all of the mechanism of an ordinary L. C. Smith typewriter, except the key levers and a few associated parts, and since these parts that may be used with my improvement have been subjected to many years of practical test and experiment and have been in a measure standardized, I am enabled to construct my improved electrically operated typewriter in a much more simple, effective and economical manner than would be possible if the entire typewriter were redesigned for the purpose of utilizing my electrically operated mechanism.

In the said L. C. Smith typewriter and perhaps other standard typewriters, the type bar operating levers have their lower ends, at least, extended in a straight line horizontally across the machine. I have adapted my improved electrical operating device to meet this condition by providing hooked levers pivotally connected to the lower ends of these type bar operating levers. By this arrangement all of the selective magnets and the operative parts connected therewith, including the universal operating bar and the said hooked levers, may be arranged in a simple, compact manner below the protecting plate 51.

Another advantage gained by the use of my improvement is that the parts may be readily assembled and also readjusted to always maintain proper working conditions, because the hooked edge of the universal operating bar can be raised or lowered very readily and easily and the downward movement of the hooked levers 32 may be adjusted by manipulation of the stop plates 26 so that there is a considerable range of movement between the hooks 33 and 36 whereby the operator may adjust them to proper relative positions, and furthermore this adjustment may be made in the case of the hooked levers 32, at least, in such a manner that the adjustment of each hook is independent of the adjustment of every other. In speaking of the adjustability of the hooked levers 32, I refer to the fact that inasmuch as the downward movement of the bell crank levers 22 is limited by the stop plate 26, the same movement of the hooked lever 32 that is connected to the bell crank lever is also limited in a corresponding manner, so that the relative positions of the hooks 33 and 36 may be quickly and accurately adjusted for effective operation.

I claim as my invention:

1. In an electrically operated typewriter having a series of substantially vertically arranged type bar operating levers, the combination of hooked levers pivoted to the lower ends of the type bar operating levers, a universal operating bar extended across the machine frame above the said hooked levers, to coöperate therewith, a series of selective electromagnets, means for energizing any of them, means operated by said selective magnets for elevating the free ends of said hooked levers to position for engaging the universal operating bar when a corresponding selective magnet is energized, a universal operating magnet, an armature therefor, and means operated by said armature for moving said universal operating bar so as to effect a movement of the selected type bar operating lever.

2. In an electrically operated typewriter, the combination of a series of type bars, a series of type bar operating levers connected with the type bars, said type bar operating levers being arranged substantially vertically and having their lower ends arranged on a substantially horizontal line across the machine, said parts being so arranged that a movement of a predetermined length of the lower end of any of said type bar operating levers will effect a printing movement of the corresponding type bar, hooked levers pivoted to the lower ends of the type

bar operating levers, a universal operating bar extended across the machine frame above the said hooked levers, to coöperate therewith, a series of selective electromagnets, means for energizing any of them, means operated by said selective magnets for elevating the free ends of said hooked levers to position for engaging the universal operating bar when a corresponding selective magnet is energized, a universal operating magnet, an armature therefor, and means operated by said armature for moving said universal operating bar so as to effect a movement of the selected type bar operating lever.

3. In an electrically operated typewriter, the combination of a series of type bars, type bar operating levers connected therewith, hooked levers pivoted to the type bar operating levers, selective magnets, means operated by the selective magnets for elevating the hooked levers, a universal operating magnet, an armature therefor, a universal operating bar extended transversely across the machine and designed to be engaged by the said hooked levers, two levers supporting said universal operating bar and extended upwardly therefrom, and means for connecting said levers with the universal operating armature.

4. In an electrically operated typewriter, the combination of a series of type bars, type bar operating levers connected therewith, hooked levers pivoted to the type bar operating levers, selective magnets, means operated by the selective magnets for elevating the hooked levers, a universal operating magnet, an armature therefor, two levers arranged in substantially upright positions, means connecting the upper ends of said levers with the universal operating magnet, and a hooked universal operating bar capable of pivotal adjustment supported at the lower ends of said levers, and designed to coact with the said hooked levers.

5. In an electrically operated typewriter, the combination of a series of type bar operating levers, a series of hooked levers pivoted to the lower ends of the type bar operating levers and provided with slots, a series of selective magnets, armatures therefor, and bell crank levers connected to said armatures at one end and slidingly mounted in the slots of the hooked levers at their other ends.

6. In an electrically operated typewriter, the combination of a series of type bar operating levers, a series of hooked levers pivoted to the lower ends of the type bar operating levers and provided with slots, a series of selective magnets, armatures therefor, bell crank levers connected to said armatures at one end and slidingly mounted in the slots of the hooked levers at their other ends, and adjustable means for limiting the downward movement of the ends of the bell crank levers that are connected to the hooked levers.

7. In an electrically operated typewriter, the combination of a series of type bar operating levers, a series of hooked levers pivoted to the lower ends of the type bar operating levers and provided with slots, a series of selective magnets, armatures therefor, bell crank levers connected to said armatures at one end and slidingly mounted in the slots of the hooked levers at their other ends, adjustable means for limiting the downward movement of the ends of the bell crank levers that are connected to the hooked levers, and springs applied to the ends of said bell crank levers that are connected to the hooked levers, for normally holding the ends of said bell crank levers and tending to move them downwardly.

8. In an electrically operated typewriter, the combination of a frame, a series of type bars spaced above the bottom of the frame, a series of type bar operating levers connected therewith and having their lower ends spaced above the bottom of the frame, a series of hooked levers pivoted to the lower ends of said type bar operating levers, a series of selective electromagnets arranged in two rows extended transversely across the machine frame on opposite sides of the said hooked levers, armatures for the selective magnets, means operated by said armatures for raising the said hooked levers when any selective magnet is energized, a universal operating magnet, an armature therefor, two levers having their lower ends extended to points adjacent to said hooked levers, means for connecting said levers to the universal operating armature, and a hooked universal operating bar carried by said levers and in position to be engaged by the said hooked levers.

9. In an electrical typewriter having a series of substantially vertically arranged pivoted type bar operating levers, the combination of hooked levers pivoted to the type bar operating levers, a universal operating bar extended across the machine frame adjacent to the said hooked levers to coöperate therewith, levers operatively connected with the said hooked levers and adapted to move the free ends thereof to position for engaging the universal operating bar, sliding contacts between the said levers and the said hooked levers, keys, means operated upon the depression of any of the keys for actuating one of the levers so connected with the said hooked levers, a universal operating magnet, an armature therefor, and means operated by the said armature for moving the universal operating bar so as to effect a movement of a type bar

operating lever when its hooked lever has been moved into position for engaging the universal operating bar.

10. In an electrically operated typewriter having a series of substantially vertically arranged type bar operating levers, the combination of hooked levers pivoted to the lower ends of the type bar operating levers, a universal operating bar extended across the machine frame above the said hooked levers to coöperate therewith, keys, means operated upon the depression of any of the said keys for elevating the free end of a corresponding hooked lever to position for engaging the universal operating bar, a universal operating magnet, an armature therefor, and means operated by the said armature for moving the said universal operating bar so as to effect a movement of the selected type bar operating lever.

11. In an electrically operated typewriter having a series of substantially vertically arranged type bar operating levers, the combination of hooked levers pivoted to the lower ends of the type bar operating levers, a universal operating bar extended transversely to the machine frame above the said hooked levers to coöperate therewith, levers operatively connected with the said hooked levers and adapted to move the free ends thereof to position for engaging the universal operating bar, sliding contacts between the said levers and the said hooked levers, keys, and means operated upon the depression of any of the keys for actuating one of the levers so connected with the said hooked levers.

12. In an electrical typewriter having a series of substantially vertically arranged pivoted type bar operating levers, the combination of hooked levers pivoted to the type bar operating levers below the pivotal points of the latter, a universal operating bar extended across the machine frame adjacent to the said hooked levers to coöperate therewith, levers operatively connected with the said hooked levers and adapted to move the free ends thereof to position for engaging the universal operating bar, sliding contacts between the said levers and the said hooked levers, keys, means operated upon the depression of any of the keys for actuating one of the levers so connected with the said hooked levers, a universal operating magnet, an armature therefor, and means operated by the said armature for moving the universal operating bar so as to effect a movement of a type bar operating lever when its hooked lever has been moved into position for engaging the universal operating bar.

13. In an electrically operated typewriter having a series of substantially vertically arranged pivoted type bar operating levers, the combination of hooked levers pivoted to the type bar operating levers below the pivotal points of the latter, a universal operating bar extended across the machine frame adjacent to the said hooked levers to coöperate therewith, keys, means operated upon the depression of any of the keys for moving one of the hooked levers to position for engaging the universal operating bar, a universal operating magnet, an armature therefor, levers supporting the said universal operating bar and extended upwardly therefrom, and means for connecting the said levers with the universal operating armature.

14. In an electrically operated typewriter, the combination of keys, type bars, type bar operating levers, hooked levers pivoted to the type bar operating levers, a universal operating bar extending across the machine frame adjacent to the said hooked levers to coöperate therewith, keys, selective magnets, means for energizing a selective magnet upon the depression of a corresponding key, sliding cores for the selective magnets, each of said cores being operatively connected with one of the hooked levers and designed to move it into position for engaging the universal operating bar when the selective magnet is energized, a universal operating magnet, an armature therefor, and means actuated by the said armature for effecting a movement of the universal operating bar.

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ERNEST HAUSBERG.