

No. 848,653.

PATENTED APR. 2, 1907.

B. F. HUTCHES, JR.
TYPE WRITER OPERATOR.
APPLICATION FILED MAY 15, 1905.

7 SHEETS—SHEET 1.

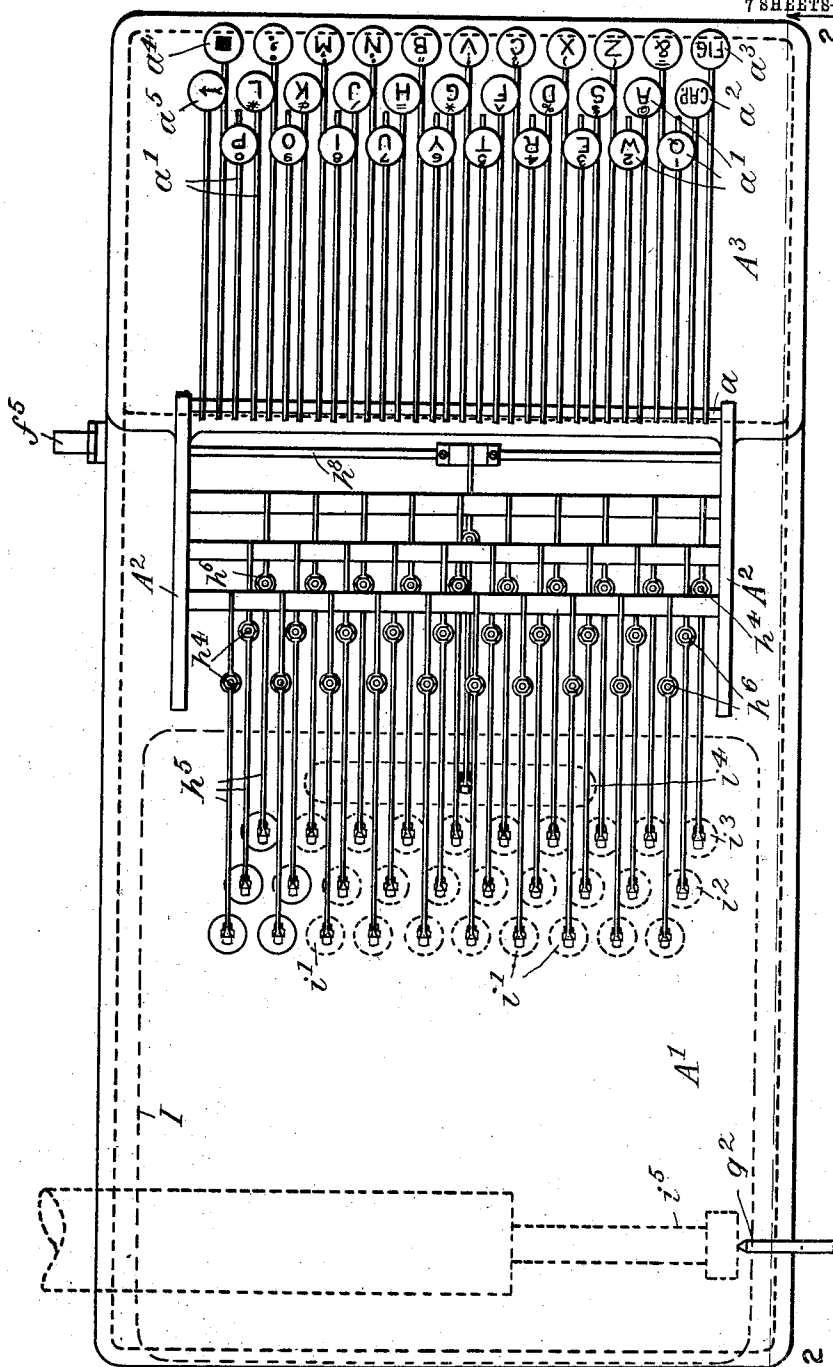


Fig. 1.

Witnesses
Arthur J. Jumper.
Fred. K. Krichelt.

Inventor
Benjamin F. Hutches, Jr.
By his Attorney Frank M. Bissell

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7 SHEETS-SHEET 2.

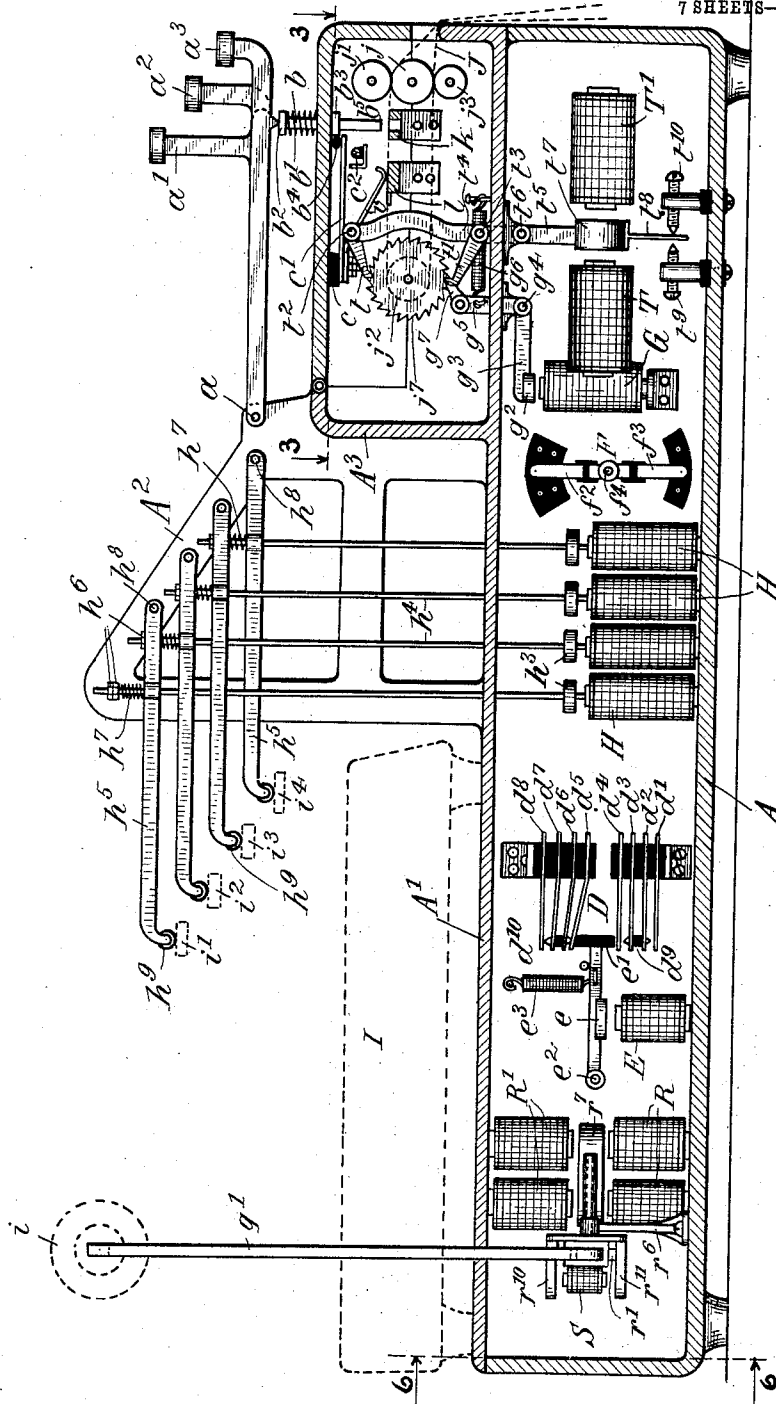


Fig. 2.

Witnesses
Arthur J. Jumper
Fred. C. Enfricht

Inventor
Benjamin F. Hutches, Jr.
By His Attorney, J. A. K. K. K.

No. 848,653.

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B. F. HUTCHES, JR.
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7 SHEETS—SHEET 3.

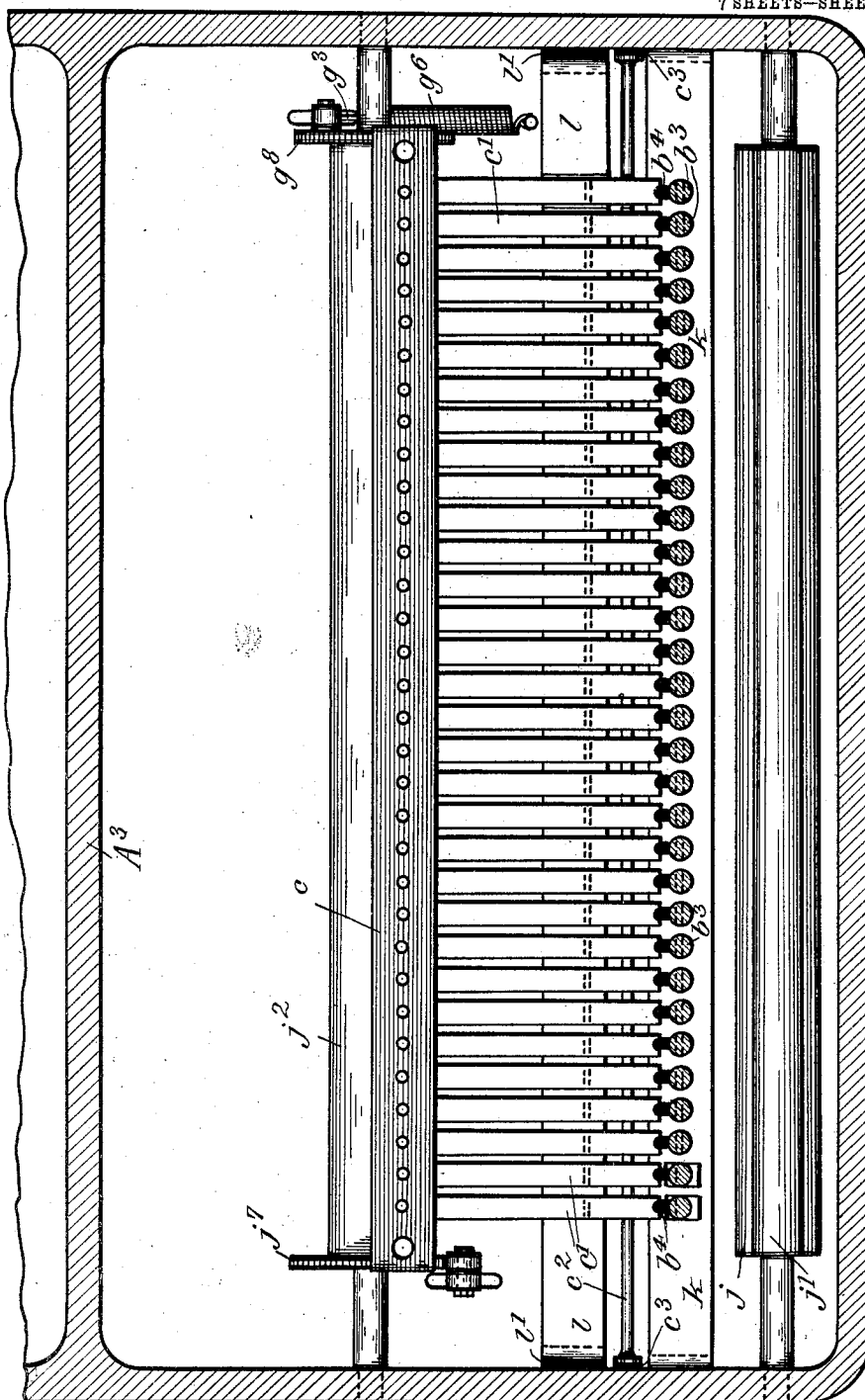


Fig. 3.

Witnesses
Arthur Grupe.
Fred. Unfricht.

Inventor
Benjamin F. Hutches Jr.
By his Attorney Frank W. Sierren

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7 SHEETS—SHEET 4.

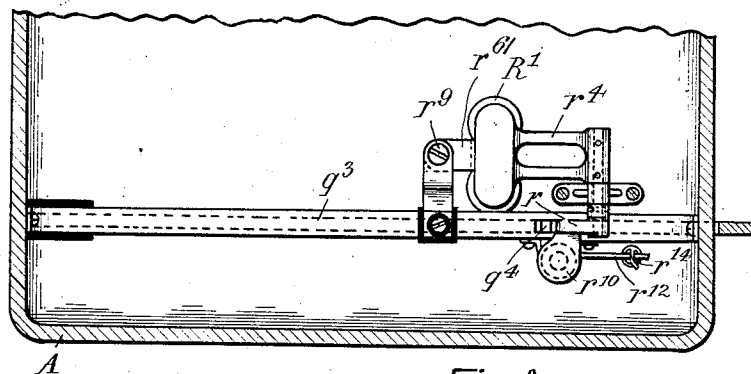


Fig. 4.

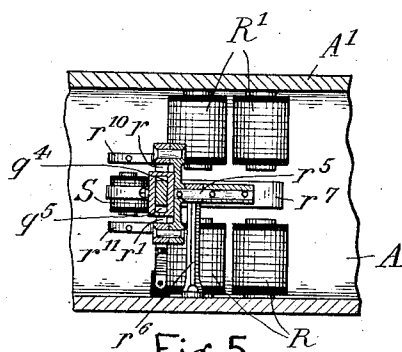


Fig. 5.

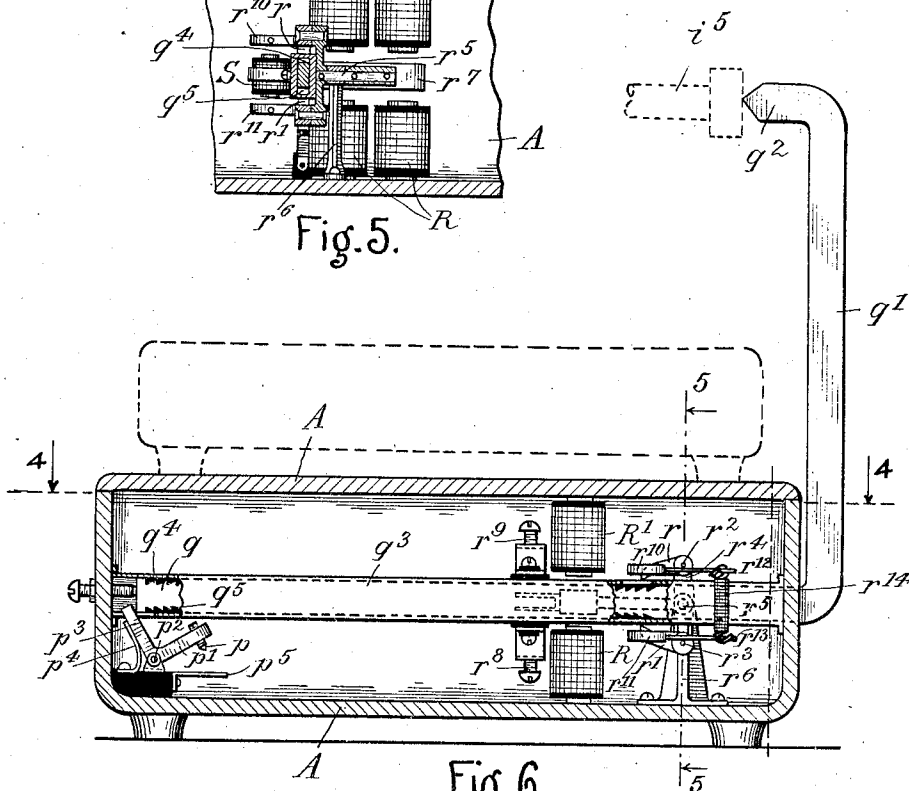


Fig. 6.

Witnesses
Arthur J. J. J.
Fred. Confricht

Inventor
Benjamin F. Hutches Jr.
By his Attorney Frank W. Sisson

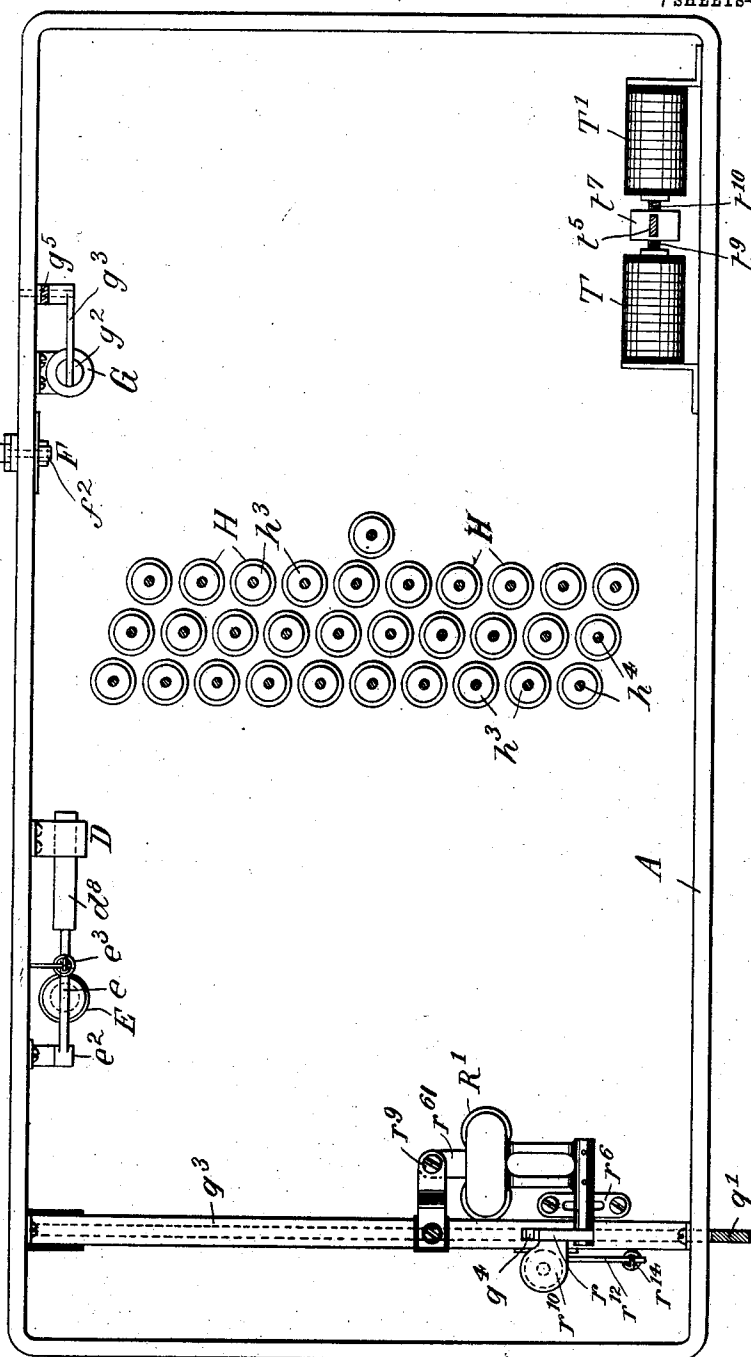
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7 SHEETS—SHEET 5.

Fig. 7.



Witnesses
Arthur J. J. J.
Fred. Unfrucht

Inventor
Benjamin F. Hutches Jr.
By his Attorney Frank R. R.

B. F. HUTCHES, JR.
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7 SHEETS—SHEET 6.

Fig. 8.

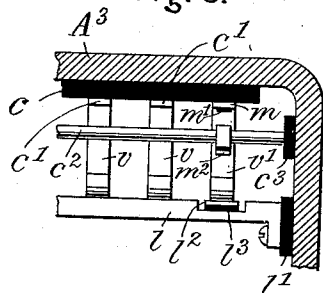


Fig. 9.

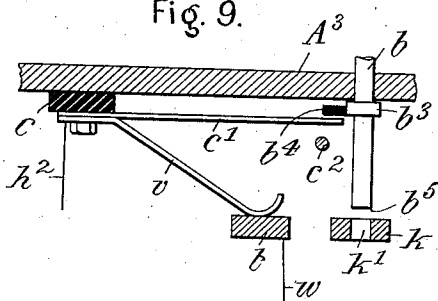


Fig. 10.

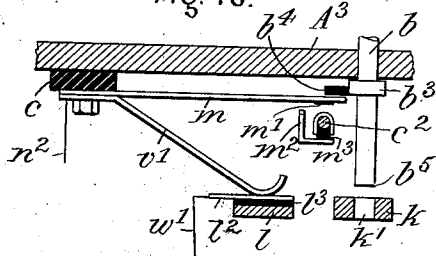
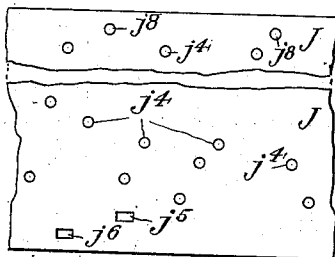


Fig. 12.



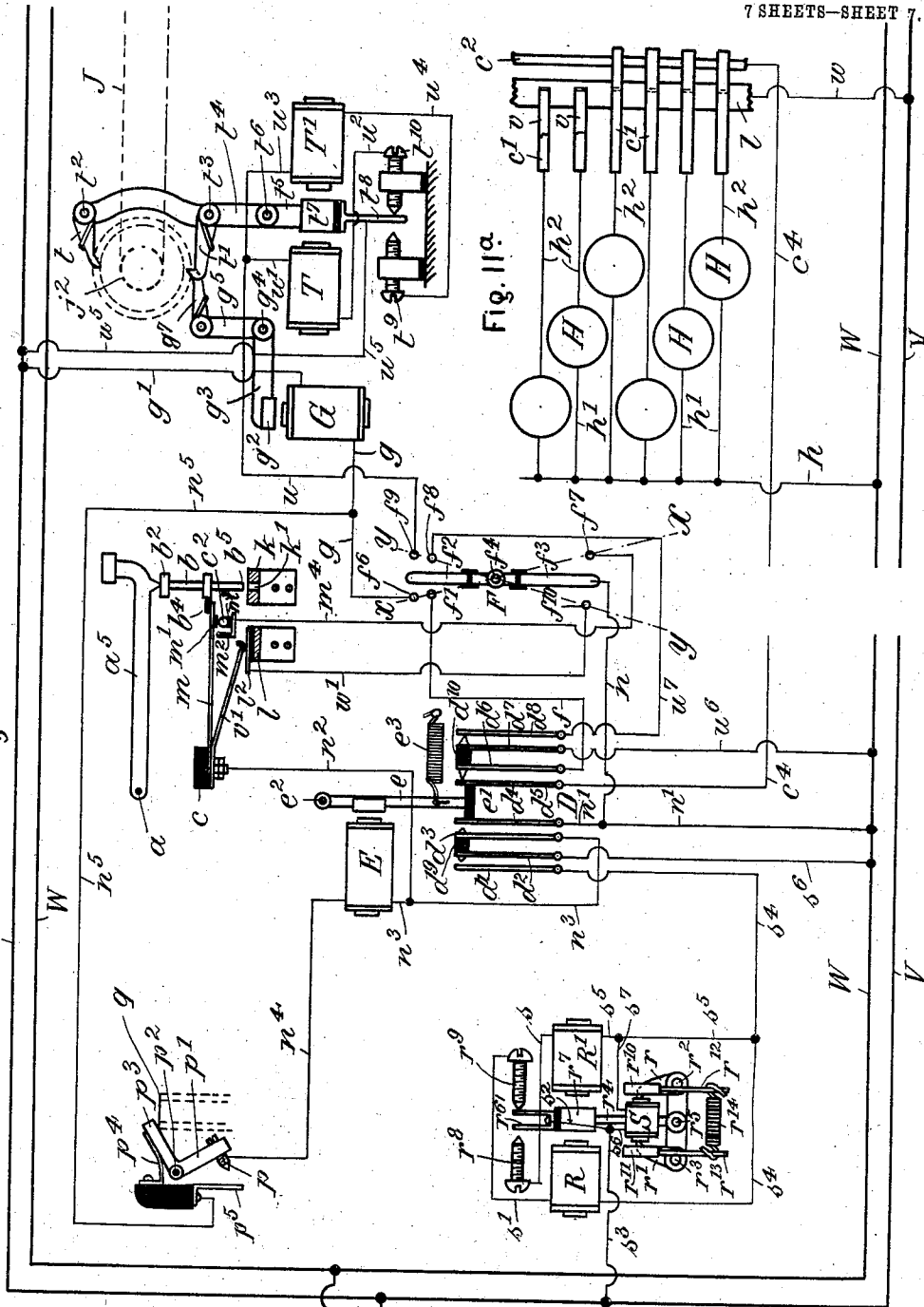
Witnesses
Arthur Guenep.
Fred. Confricht.

Inventor
Benjamin F. Hutches Jr.
By his Attorney Frank H. Pieser

B. F. HUTCHES, JR.
TYPE WRITER OPERATOR.
APPLICATION FILED MAY 15, 1905.

7 SHEETS—SHEET 7.

Fig. II.



Witnesses
Arthur Zuercher
Fred. Unfriedt

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Z

Inventor
Benjamin F. Hutches Jr.
By his Attorney Daniel W. Brier

UNITED STATES PATENT OFFICE.

BENJAMIN F. HUTCHES, JR., OF NEW YORK, N. Y.

TYPE-WRITER OPERATOR.

Nc. 848,653.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed May 15, 1905. Serial No. 260,413.

To all whom it may concern:

Be it known that I, BENJAMIN F. HUTCHES, Jr., a citizen of the United States, residing at New York city, Manhattan, county and State of New York, have invented new and useful Improvements in Type-Writer Operators, of which the following is a specification.

This invention relates to a machine adapted to be used in conjunction with a type-writer of any of the well-known constructions, and adapted to actuate such type-writer by operating the keys of the same. The machine is entirely independent from the type-writer itself, so that the type-writer may be used with or without the machine, and the machine may be used successively on any number of type-writers.

The operator or attachment is so constructed that it may be actuated either by hand or by a perforated record which has previously been formed by the attachment. The latter is provided with a keyboard which corresponds substantially to the keyboard of the type-writer to be operated. The construction is such that the depression of a key on the attachment effects the descent of a corresponding key on the type-writer to form a writing and may simultaneously punch a hole into a record-sheet. If it is desired to subsequently produce several type-written duplicates of the original writing, it is only necessary to repeatedly run the record through the attachment, when the latter will automatically actuate the type-writer to multiply the writing.

In the accompanying drawings, Figure 1 is a plan of my improved type-writer attachment, showing the type-writer diagrammatically in dotted lines; Fig. 2, a vertical section on line 2 2, Fig. 1; Fig. 3, an enlarged section on line 3 3, Fig. 2; Fig. 4, a horizontal section on line 4 4, Fig. 6; Fig. 5, a vertical section on line 5 5, Fig. 6; Fig. 6, a vertical section on line 6 6, Fig. 2, showing the carriage-return mechanism; Fig. 7, a plan of the lower section of the casing with the top plate removed; Fig. 8, a detail of the spring-contacts; Fig. 9, a detail section of the spring-contacts for the character-keys; Fig. 10, a similar section of the spring-contacts for the carriage-return key. Figs. 11 and 11^a are diagrams showing the electric connections, and Fig. 12 shows part of a perforated record.

The letter A indicates the lower portion of

the casing of the attachment, having top-plate A', which serves to support the type-writer to be operated. From the plate A' rise two upright parallel standards A², that support a transverse rod or spindle a. Upon the latter are fulcrumed the keys a' a', a², a³, a⁴, and a⁵, terminating at their outer ends in the usual finger-pieces, the whole constituting the keyboard of the attachment. a' are the character-keys.

a² a³ are respectively used for writing capitals and figures.

a⁴ is the spacing-key, and a⁵ is used for returning the carriage. It may here be stated that the keyboard of the type-writer attachment must correspond substantially to the keyboard of the type-writer to be operated, and consequently a different arrangement and number of the keys is required for each different system of type-writers.

Each key a' a⁵ rests upon a plunger b, passing through the top of a compartment A³, which is formed over the front portion of top plate A'. The plungers b are mounted in vertical alinement with the keys and are normally held in their uppermost position by springs b', engaging heads b² of the plungers. Within casing A³ the plungers are provided with collars b³, that limit their upward play and carry insulating-fingers b⁴. The lower ends of the plungers constitute punches b⁵ for perforating a record, as hereinafter described.

To a length of insulation c, secured within casing A³, are attached a series of spring-contacts c', which correspond to the number of plungers b and are adapted to be engaged by the fingers b⁴. Beneath contacts c' is arranged a horizontal contact-rail c², secured to casing A³ by insulators c³. As thus far described the depression of a key will bring the corresponding contact c' into engagement with contact-rail c². From the latter a wire c⁴ leads to a contact-spring d⁵ of a switch D. This switch is composed of eight contact-springs d' d² d³ d⁴ d⁵ d⁶ d⁷ d⁸, the springs d² d³ and d⁶ d⁷ being connected to each other by insulators d⁹ d¹⁰, respectively. Between springs d⁴ d⁵ an insulating cross-piece e' is interposed, which is carried by the free end of the armature e of an electromagnet E. This armature is pivoted at e² and is adapted to be drawn away from magnet E by spring e³. It will be seen that when magnet E is inactive spring e³ will draw armature e, and consequently cross-piece e', to the right, so that the latter closes contact between

15 springs $d^5 d^6$ and $d^7 d^8$, respectively. If magnet E is energized in manner hereinafter described, cross-piece e' will move to the left to close contact between springs $d^7 d^8$ and $d^3 d^4$, respectively, while contact between springs $d^5 d^6$ and $d^7 d^8$ is broken.

20 Spring d^6 is by a wire f connected to a contact f' of a switch F, the knife of which, consisting of two insulated sections $f^2 f^3$, is pivoted at f^4 and has a handle f^5 projecting out of casing A. The switch F is adapted to assume three different positions—the first for breaking the circuits, (full lines, Fig. 11,) the second for manual operation, (line X X,) and the third for operation by the perforated record hereinafter described, (line Y Y.) In the position X X the upper knife-section f^2 electrically connects contacts $f' f^6$, while lower knife-section f^3 is in engagement with a contact f^7 . From contact f^6 a wire g leads to an electromagnet G, hereinafter described, and which is connected by wires g' and V to one pole of a source of electricity Z. The other pole of said source is by wire W connected to a feed-wire h . To the latter are connected by branches h' a series of electromagnets H, that correspond in number to the number of keys $a' a^2$. A branch h^2 connects each electromagnet H with a corresponding spring-contact c' .

30 Each electromagnet H has a vertically-movable armature h^3 secured to a rod h^4 , which is suspended from a lever or finger h^5 by means of nuts h^6 and a spring h^7 . The levers h^5 carry rollers h^9 at their free ends and correspond to and constitute the means for operating the keys, and consequently the type-bars, of the type-writer. The levers turn on spindles h^8 , secured to the standards A^2 , and rest with their rollers h^9 upon the keys $i' i^2 i^3$ and spacing-bar i^4 of the type-writer I. This type-writer is adapted to be removably placed upon the rear portion of top plate A' , so that the levers h^5 will assume an operative engagement with the type-writer keys.

45 In Figs. 1 and 2 $i' i'$ denote the character-keys of the type-writer, while $i^2 i^3$ denote the capital and figure shift-keys, respectively.

50 As thus far described the operation is as follows: The knife of switch F is so set as to occupy position X X. The depression of one of the keys $a' a^2 a^3 a^4$ will by plunger b and finger b^4 effect an engagement of the corresponding spring c' with rail c^2 . By this engagement a current will travel as follows: from Z, through wires V g' , electromagnet G, wire g , contact f^6 , switch-knife f^2 , contact f' , wire f , spring-contacts $d^5 d^6$, wire c^4 , contact-rail c^2 , spring c' , branch h^2 , electromagnet H, branch h' , wires h and W back to source of electricity Z. The current will thus energize the electromagnet H, which by attracting its armature h^3 will by rod h^4 lower lever h^5 . The lever h^5 will thus depress the key of the type-writer upon which it rests. As a spring-con-

tact c' and an electromagnet H is provided for each key a' , as well as for each of the keys $a^2 a^3 a^4$, it is obvious that the depression of any one of such keys will effect a descent of the corresponding key $i' i^2 i^3$ or the spacing-bar i^4 of the type-writer.

The depression of any one of the keys $a' a^2 a^3 a^4$ will besides closing the circuit above referred to serve to feed and perforate a record J in the following manner: Within casing A^3 are secured a pair of transverse rails k and l , the latter being insulated from the casing A^3 , as at l' . The rail k is arranged vertically below the punches b^5 and is perforated, as at k' , in alinement with each of the punches. The record J passes between rollers $j j'$, over rails $k l$, around a feed-roller j^2 , and back between rollers $j j^3$. It will thus be seen that each depression of a key will punch a corresponding perforation into the blank-record, which is intermittently advanced in the following manner: The armature g^2 of electromagnet G is secured to one arm g^3 of an elbow-lever $g^3 g^5$, pivoted to top plate A' at g^4 . The other arm g^5 of this lever is influenced by a spring g^6 and carries at its upper end a spring-influenced pawl g^7 , engaging a ratchet-wheel g^8 , fast on feed-roller j^2 of the record J.

The depression of any one of the keys $a' a^2 a^3 a^4 a^5$ will send a current through electromagnet G, as already described. The latter being thus energized will attract armature g^2 , which will swing the upper arms g^5 of the elbow-lever $g^3 g^5$ to the left, and thus withdraw pawl g^7 from one tooth and bring it into engagement with the next tooth of ratchet-wheel g^8 without moving said wheel. Upon the release of the key spring b' lifts plunger b to withdraw punch b^5 from rail k and record J and break the contact between spring c' and rail c^2 . Electromagnet G will thus become deenergized to allow pawl g^7 by spring g^6 to advance ratchet g^8 and to correspondingly feed record J. From the above it will be seen that during the depression of a key the record remains stationary, while upon the release of the key the record is automatically advanced and brought in proper position for the next punching operation.

For returning the type-writer carriage the following mechanism is provided: The carriage-return key a^5 of the attachment depresses a plunger b of the same construction as the plungers previously described and adapted to perforate the record by its punch b^5 . Finger b^4 of this plunger is alined with a contact-spring m , Fig. 10, secured to insulator c and having an insulator m' above rail c^2 . Spring m is adapted to engage a contact m^2 secured to rail c^2 , but insulated therefrom, as at m^3 . Contact m^2 is connected by wire m^4 to contact f^7 , while from switch-knife f^3 wires $n n'$ lead to wire W. Spring m is by wires $n^2 n^3$ connected to an electromagnet E, from which a wire n^4 leads to a contact-screw

p. This screw is tapped into one arm *p'* of an angle-lever *p' p³*, pivoted at *p²*, its other arm *p³* being influenced by a spring *p⁴*. Arm *p³* is arranged in the path of a carriage-return rack *q* in such a way that upon the completed or nearly-completed return of the type-writer carriage *i⁵* rack *q* will tilt lever *p' p³* against action of spring *p⁴*. Thus screw *p* is brought out of engagement with a fixed insulated contact-plate *p⁵*. It will be seen that while the rack *q* is out of engagement with lever *p' p³* screw *p* will rest against plate *p⁵*. The latter is by wire *n⁵* connected to wire *g*.

If it is desired to return the carriage, the key *a⁵* is depressed to close a circuit, the current flowing as follows: From source of electricity *Z* through wires *V g'*, electromagnet *G*, wires *g n⁵*, closed contact *p⁵ p*, wire *n⁴*, electromagnet *E*, wires *n² n³*, contact-spring *m*, contact-piece *m²*, wire *m⁴*, contact *f⁷*, switch-knife *f³*, and wires *n n'* *W* back to the source of electricity. In this way the two electromagnets *G* and *E* will be energized, the armature of magnet *G* serving to feed the record *J* in manner hereinabove described. The energizing of electromagnet *E* will attract armature *e*, and thus by swinging the same to the left will close contacts *d' d²* and *d³ d⁴*, while the previously-closed contacts *d⁵ d⁶* and *d⁷ d⁸* are opened. Contact *d³* is by wire *n³* connected to electromagnet *E*, while contact *d⁴* is by wire *n'* connected to wire *W*. By this arrangement the magnet *E* will remain energized even after the key *a⁵* has been released and the circuit above described has been broken by the disengagement of spring *m* and contact *m²*. The current for energizing magnet *E* after the release of key *a⁵* travels as follows: From source of electricity *Z* through wires *V*, wire *g'*, electromagnet *G*, wires *g n⁵*, closed contact *p⁵ p*, wire *n⁴*, electromagnet *E*, wire *n³*, closed spring-contacts *d³ d⁴*, and wires *n' W*, back to source of electricity. The closing of contacts *d' d²* starts the mechanism for returning the carriage of the type-writer. This mechanism consists of an upwardly-extending arm *q'* of rack *q*, which with its pointed end *q²* bears against the carriage *i⁵* of type-writer *I*. (Shown diagrammatically in dotted lines in Figs. 6 and 11.) Rack *q* is longitudinally movable in a suitable guideway *q³* and is provided with an upper set of teeth *q⁴* and a lower set of teeth *q⁵*. The teeth *q⁴ q⁵* are adapted to be engaged, respectively, by an upper pawl *r* and a lower pawl *r'*, pivoted at *r² r³* to a T-shaped lever *r⁴*, which is fulcrumed at *r⁵* to a bracket *r⁶*. The lever *r⁴* constitutes a vibrator and is provided with a contact-piece *r^{6'}* and an armature *r⁷*, adapted to play between electromagnets *R R'*. Opposite contact-piece *r^{6'}* are arranged a pair of contact-screws *r⁸ r⁹*, of which screw *r⁸* is connected to electromagnet *R'* by a wire *s*, while

screw *r⁹* is connected to magnet *R* by wire *s'*. The contact-piece *r^{6'}* is further connected to wire *V* by wires *s² s³*. Electromagnet *R* is by a wire *s⁴* in connection with spring-contact *d'*, while magnet *R'* is connected to wire *s⁴* by branch *s⁵*. From contact *d²* a wire *s⁶* leads to wire *W*. Each pawl *r r'* is provided with the armatures *r¹⁰ r¹¹*, respectively, of an electromagnet *S*, located between said armatures. The armatures *r¹⁰ r¹¹* are extended to form tailpieces *r¹² r¹³*, which are drawn toward each other by a spring *r¹⁴*. It will be seen that by this spring the pawls *r r'* are normally held out of engagement with the rack *q*, so that the latter is free to move during the writing operation. Electromagnet *S* is by wires *s⁶ s⁷* connected to wires *s³ s⁵*, respectively.

The operation of the carriage-return device is as follows: As has been stated, spring-contacts *d' d²* have been brought into engagement by the energizing of electromagnet *E*, so that a current will flow from source of electricity *Z*, through wires *W s⁶*, contacts *d² d'*, wire *s⁴*, electromagnet *R*, wire *s'*, screw *r⁹*, contact-piece *r^{6'}*, and wires *s² s³* *V* back to source of electricity. A current will also flow in shunt-circuit to electromagnet *R*, from wire *s⁴*, through wires *s⁵ s⁷*, electromagnet *S*, and wire *s⁶* to wire *s³*. This current will energize electromagnet *S*, and will consequently draw the pawls *r r'* into engagement with rack *q* against the action of spring *r¹⁴*. The energizing of electromagnet *R* will attract its armature *r⁷*, and thus open contact between piece *r^{6'}* and screw *r⁹*, while a contact is closed between piece *r^{6'}* and screw *r⁸*. In this way a current will now flow from wire *s⁵* through electromagnet *R'*, wire *s*, screw *r⁸*, to contact-piece *r^{6'}*, which current will energize electromagnet *R'* to attract armature *r⁷*. In this way lever *r⁴* will continuously oscillate as long as contacts *d' d²* are closed. This oscillation of lever *r⁴* will return rack *q*, through the action of the oscillating pawls *r r'*, which are held in engagement with the rack by electromagnet *S*. As soon as the carriage arrives at the terminal position it will tilt lever *p' p³*, so as to break contact between screw *p* and plate *p⁵*. In this way the current which was flowing through electromagnet *E* will be broken to release armature *e*. Spring *e³* will now draw armature *e* away from electromagnet *E* to again close spring-contacts *d⁵ d⁶* and *d⁷ d⁸*, while contacts *d' d²* and *d³ d⁴* have become disengaged. This will stop the operation of the carriage-return device and spring *r¹⁴* will withdraw pawls *r r'* from rack *q*.

In the example illustrated by the drawings it is assumed that a type-writer is used which is so constructed that the platen for feeding the paper is turned automatically for one or more line-spaces whenever the carriage arrives at its terminal position. If

type-writers of other systems are used, various means may be provided for advancing the paper without departing from the spirit of the invention.

5 When the type-writer is to be operated by a record previously punched, switch D is turned, so as to assume position Y Y. In this way a pair of contacts $f^8 f^9$ will be engaged by switch-knife f^2 , the latter bearing
10 against a contact f^{10} . The record J is automatically fed by roller j^2 in the following manner: A ratchet-wheel j^1 of roller j^2 is engaged by a pair of spring-influenced pawls $t^1 t^2$, pivoted at $t^2 t^3$, respectively, to the upper arm t^4
15 of a double lever $t^4 t^5$. The latter is fulcrumed at t^6 and carries on its lower arm t^5 an armature t^7 and a tongue t^8 . Opposite armature t^7 there are placed two electromagnets T T', while opposite tongue t^8 are mounted
20 two contact-screws $t^9 t^{10}$. Electromagnet T is connected to contact f^9 by wires $u' u$ and to screw t^{10} by a wire u^2 . Electromagnet T' is in connection with wire u by a wire u^3 and with screw t^9 by a wire u^4 , while from tongue
25 t^8 a wire u^5 leads to wire V. Spring-contacts $d^7 d^8$ are by wires $u^6 u^7$ connected to wire W and contact f^8 , respectively. By the construction described a current will flow in the following manner: From source of electricity
30 Z through wires W u^6 , closed contacts $d^7 d^8$, wire u^7 , contact f^8 , knife f^2 , contact f^9 , wires $u u'$, electromagnet T, wire u^2 , screw t^{10} , tongue t^8 , and wires u^5 V back to source of electricity. This current will energize electro-
35 magnet T to attract armature t^7 and to bring tongue t^8 into contact with screw t^9 , while the contact between tongue t^8 and screw t^{10} will be broken. A current will consequently flow from wire u through wire u^3 ,
40 electromagnet T', wire u^4 , screw t^9 to tongue t^8 to energize electromagnet T', while electromagnet T is deenergized. In this way an oscillating movement will be imparted to lever $t^4 t^5$, which in turn by pawls $t^1 t^2$ will inter-
45 mittently advance ratchet-wheel j^1 . In this way the perforated record J is continuously drawn over rail l. To each spring-contact c' is secured a second spring-contact v , which is in alinement with the longitudinal
50 row of perforations j^4 of the record previously made by the corresponding punch. Rail l is connected to wire V through wire w.

It will be seen that as long as an imperforate section of the record moves between
55 rail l and spring-contact v the latter will be insulated from the rail; but as soon as a perforation in the record arrives beneath contact v the latter will touch rail l through the perforation j^4 . In this way a current will be
60 closed as follows: from source of electricity Z, through wires W $h h'$, electromagnet H, wire h^2 , spring-contact v , rail l, and wires w V, back to source of electricity. Electro-
65 magnet H being energized will draw its armature h^3 downward to depress the corre-

sponding key of the type-writer by finger h^5 . The operation of the capital and figure shift-keys is effected in a like manner by perforations $j^5 j^6$, respectively, of the record. It will
70 be seen from Fig. 12 that the perforations $j^5 j^6$ are longer than the character-perforations j^4 . By these means the spring v , co-operating with the capital or figure perforations $j^5 j^6$, will come into contact with rail l in
75 advance of the spring v , coöperating with the character-perforation j^4 . Thus the carriage will be shifted before the key strikes the paper and will be held in this position until the character has been properly printed. The
80 return of the carriage takes place as soon as the carriage-return perforation j^8 arrives under a spring-arm v' , secured to contact m. This will effect two different operations—
85 i. e., it will stop the automatic feed of the record and it will start the carriage-return mechanism. After the carriage has been returned the return mechanism is stopped, while the automatic feed of the record is re-
90 sumed. For this purpose spring-contact v' is adapted to engage a plate l^2 , insulated from rail l, as at l^2 . From plate l^2 a wire w' leads to contact f^{10} of switch F. After a carriage-return perforation has arrived beneath
95 spring-contact v' a circuit is closed, the current flowing as follows: from source of electricity Z, through wires W $n' n$, switch-knife f^3 , contact f^{10} , wire w' , plate l^2 , spring-contact v' , wires $n^2 n^3$, electromagnet E, wire n^4 ,
100 closed contact $p p^5$, wires $n^5 g$, electromagnet G, and wires $g' V$, back to source of electricity. This current will cause electromagnet E to attract its armature e , so as to break contacts $d^7 d^8$ and stop the automatic record-
105 feeding device by disenergizing electromagnets T T'. Simultaneously contacts $d^7 d^8$ have been brought into engagement to start the carriage-return device in the manner hereinabove described. At the arrival of the
110 carriage at its terminal position contact $p p^5$ will be broken to stop the carriage return by disenergizing electromagnet E and releasing its armature. In this way contacts $d^7 d^8$ are again closed and the automatic record-feed
115 mechanism is restarted. After a type-written copy has been produced by the record the apparatus may be arrested by bringing switch F into its neutral position.

It will be seen that the manipulation of the attachment when coupled to a type-writer
120 produces an original on the type-writer and simultaneously a record of such original on the attachment. If at any time subsequent this record is fed through the attachment in
125 manner hereinabove described any number of duplicates of the original are produced on the type-writer. These duplicates are not
the carbon copies heretofore made, but are all originals—i. e., they are all formed by a
130 direct contact of the type with the paper. In this way an unlimited number of dupli-

cates can be automatically turned out, each duplicate being, in fact, an original writing and receiving the attention usually accorded to original writings only.

5 What I claim is—

1. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, manually-actuated means on the operator-frame for
10 operating the keys of a type-writer, and additional automatically-actuated means for operating said keys, substantially as specified.

2. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, manually-actuated keys on the operator-frame for operating the keys of the type-writer, and means actuated by the operator-keys for
15 simultaneously producing a record, substantially as specified.

3. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, manually-actuated means on the operator-frame adapted to operate type-writer keys, and a record also adapted to operate said keys,
25 substantially as specified.

4. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, means on the operator-frame adapted to actuate type-writer keys, keys for manually operating said actuating means, and means for automatically operating said actuating means, substantially
30 as specified.

5. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, means on the operator-frame adapted to actuate type-writer keys, keys for manually operating said actuating means, and a record for automatically operating said actuating means, substantially
35 as specified.

6. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer characters, keys on the operator-frame for manually operating said electrically-controlled means, and means on the operator-frame for automatically operating said electrically-controlled means, substantially as specified.
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7. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer characters, keys on the operator-frame for manually operating said electrically-controlled means, and a record adapted to also operate said electrically-controlled means, substantially
45 as specified.

8. As a new article of manufacture, a type-

writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer characters, means for manually operating said actuating
70 means, and means for automatically operating said actuating means, substantially as specified.

9. As a new article of manufacture, a type-writer operator provided with electrically-controlled means adapted to actuate type-writer characters, keys for manually operating said actuating means, and a record for automatically operating said actuating means, substantially as specified.
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10. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer characters, keys for manually operating said actuating means, and means operated by the keys for producing a record, substantially as specified.
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11. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, means on the operator-frame adapted to actuate type-writer keys, and punches adapted to simultaneously perforate a record, substantially as specified.
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12. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, manually-actuated keys on the operator-frame adapted to operate type-writer keys, and punches simultaneously actuated by said operator-keys and adapted to form a record, substantially as specified.
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13. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer keys, punches adapted to perforate a record, means for intermittently feeding the record, and keys for actuating the electrically-controlled means and the punches, substantially as specified.
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14. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer characters, keys for manually operating said actuating means, means actuated by the keys for producing a record, and means adapted to be controlled by the record for operating the actuating means, substantially as specified.
100

15. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer shift-keys, and means for manually operating said actuating means, substantially as specified.
105

16. As a new article of manufacture, a

type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer shift-keys, and means for automatically operating said actuating means, substantially as specified.

17. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame adapted to actuate type-writer shift-keys, keys for operating said actuating means, and means actuated by the keys for producing a record, substantially as specified.

18. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame for depressing and maintaining depressed a type-writer shift-key, electrically-controlled means for depressing a type-writer character-key, electrically-controlled means for releasing both keys, and means for manually operating the electrically-controlled means, substantially as specified.

19. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame for depressing and maintaining depressed a type-writer shift-key, electrically-controlled means for depressing a type-writer character-key, electrically-controlled means for releasing both keys, and means for automatically operating the electrically-controlled means, substantially as specified.

20. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, means on the operator-frame for returning a type-writer carriage, and means for automatically operating the carriage-return means, substantially as specified.

21. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, means on the operator-frame for returning a type-writer carriage, and a record for operating the carriage-return means, substantially as specified.

22. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, means on the operator-frame for returning a type-writer carriage, and means for producing a carriage-return record, substantially as specified.

23. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, means on the operator-frame for returning a type-writer carriage, means for manually operating the carriage-return means, and means for producing a record, substantially as specified.

24. As a new article of manufacture, a

type-writer operator provided with electrically-controlled means for actuating type-writer character-keys and type-writer shift-keys, means for returning a type-writer carriage, and manually-operated means for controlling the first and second named means, substantially as specified.

25. As a new article of manufacture, a type-writer operator provided with electrically-controlled means for actuating type-writer character-keys and type-writer shift-keys, means for returning a type-writer carriage, and manually-controlled means for controlling the first and second named means and for producing a record, substantially as specified.

26. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, electrically-controlled means on the operator-frame for actuating type-writer character-keys and type-writer shift-keys, means for returning a type-writer carriage, and automatically-operated means for controlling the first and second named means, substantially as specified.

27. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, fingers pivoted to the operator-frame and adapted to actuate the type-writer characters, and means for automatically actuating the fingers, substantially as specified.

28. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, a key on the operator-frame, a contact, an electromagnet in circuit, means for actuating a type-writer character and adapted to be operated by the electromagnet, and a punch adapted to be simultaneously operated by the key, substantially as specified.

29. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, a key on the operator-frame, a pair of electromagnets, means for operating a type-writer character and adapted to be actuated by one of said electromagnets, a punch adapted to be actuated by the key, and record-feeding means adapted to be actuated by the second electromagnet, substantially as specified.

30. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, a key on the operator-frame, a vibrator, pawls on the vibrator, and a rack which is engaged by the pawls and is operatively connected to the type-writer carriage, substantially as specified.

31. As a new article of manufacture, a type-writer operator comprising a frame independent of the type-writer frame, an electromagnet on the operator-frame, a switch operated thereby, a vibrator in circuit with

the switch, means for returning the type-writer carriage, and means for operatively connecting the vibrator with the carriage-return means, substantially as specified.

5 32. As a new article of manufacture; a type-writer operator provided with a rack adapted to engage a type-writer carriage, a double lever adapted to be engaged by the rack, a contact controlled by said lever, an
10 electromagnet in circuit, and means controlled by the electromagnet for operating the rack, substantially as specified.

33. As a new article of manufacture, a type-writer operator comprising a frame in-
15 dependent of the type-writer frame, an electric vibrator on the operator-frame, spring-influenced pawls pivoted thereto, a rack adapted to engage the type-writer carriage, and an electromagnet for effecting an en-
20 gagement between the pawls and the rack, substantially as specified.

34. As a new article of manufacture, a type-writer operator comprising a frame in-
25 dependent of the type-writer frame, a record-feed roller on the operator-frame, a record, contacts at opposite sides thereof, a ratchet-wheel mounted on the feed-roller, pawls engaging the ratchet-wheel, an armature to which the pawls are operatively connected,
30 and a pair of electromagnets on opposite sides of the armature, substantially as specified.

35. As a new article of manufacture, a type-writer operator comprising a frame in-
35 dependent of the type-writer frame, a pair of contacts on the operator-frame, an interme-

diated record, means for feeding the record, an electromagnet in circuit with the contacts, and means operatively connected to said electromagnet for actuating the type-writer
40 characters, substantially as specified.

36. As a new article of manufacture, a type-writer operator provided with means for feeding a record, means operated by the re-
45 cord for automatically returning a type-writer carriage, and means for automatically arresting the record-feeding means during the carriage-return motion, substantially as specified.

37. As a new article of manufacture, a
50 type-writer operator provided with means for feeding a record, contacts at opposite sides of the record, an electromagnet in circuit, a switch operated by the electromagnet-armature, and means controlled by the switch for
55 returning a type-writer carriage and operating the record-feeding means, substantially as specified.

38. As a new article of manufacture, a type-writer operator provided with a record
60 having differently-sized perforations, contacts controlled thereby, means controlled by the larger perforations for shifting a type-writer carriage, and means controlled by the
65 smaller perforations for operating the type-writer characters, substantially as specified.

Signed by me at New York city, Manhattan, New York, this 13th day of May, 1905.

BENJAMIN F. HUTCHES, JR.

Witnesses:

FRANK V. BRIESEN,
WM. R. SCHULZ.