

(No Model.)

3 Sheets—Sheet 1.

G. H. DAVIS.
TYPE WRITING MACHINE.

No. 560,572.

Patented May 19, 1896.

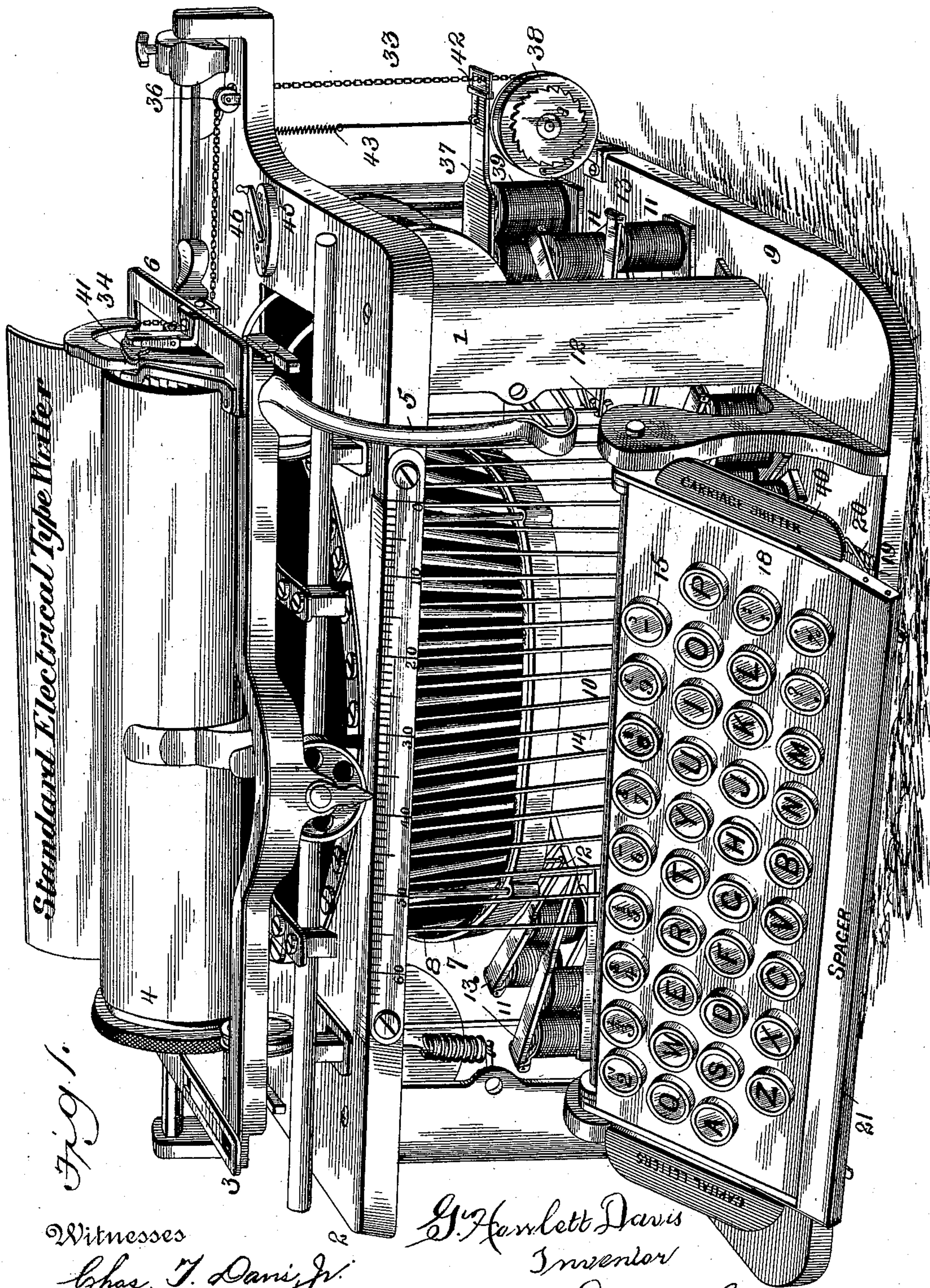


Fig. 1.

Witnesses

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Attorneys.

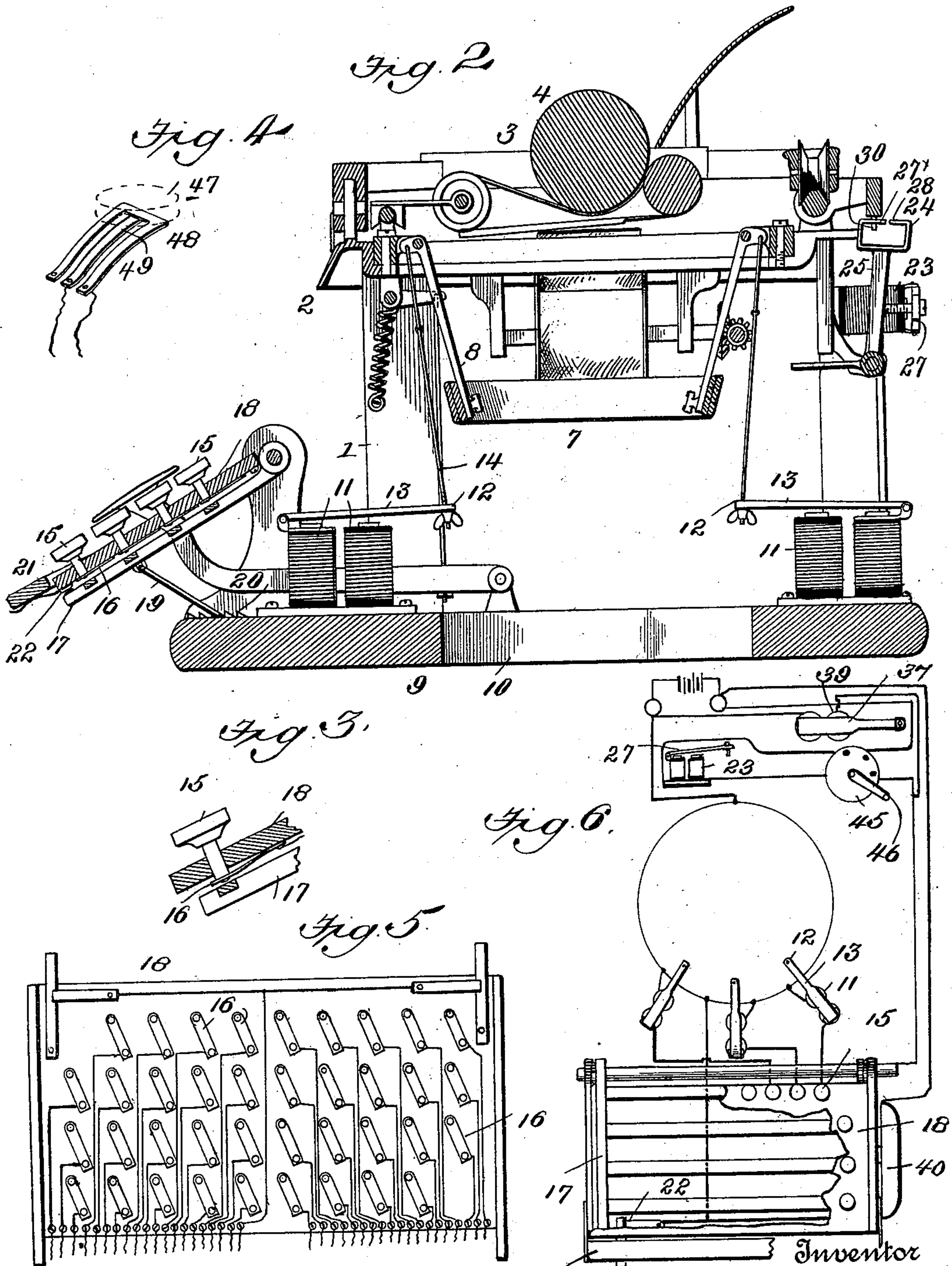
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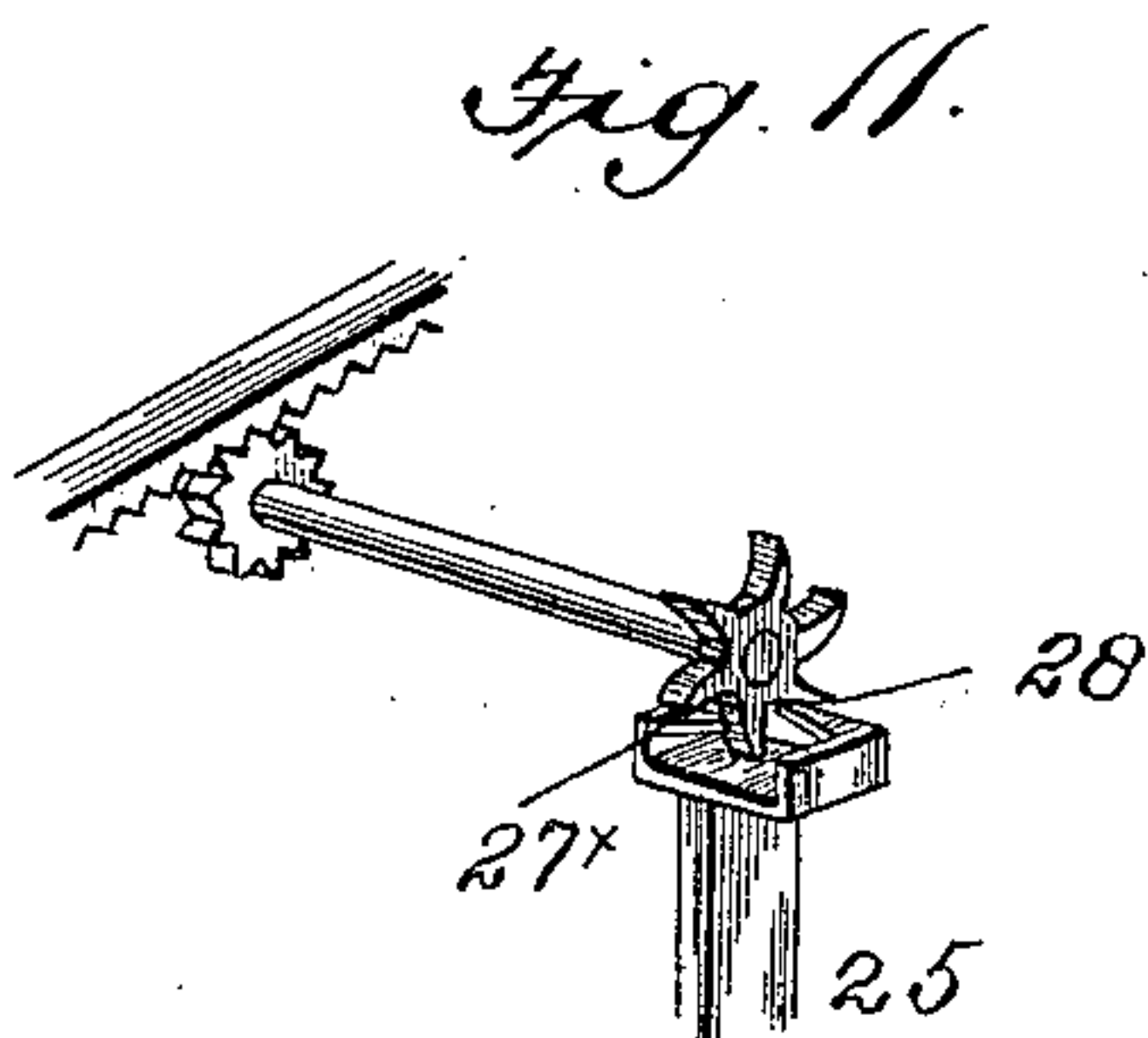
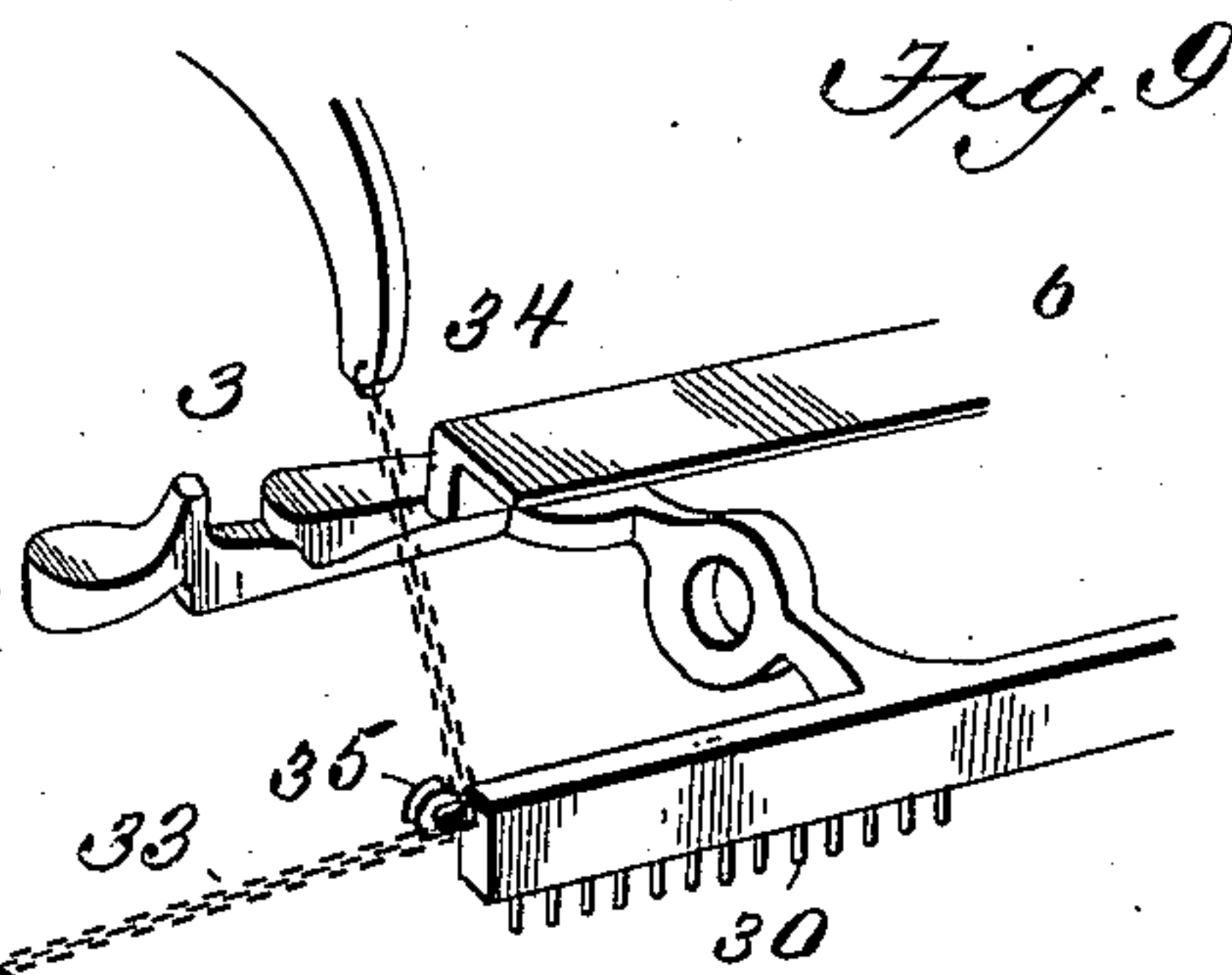
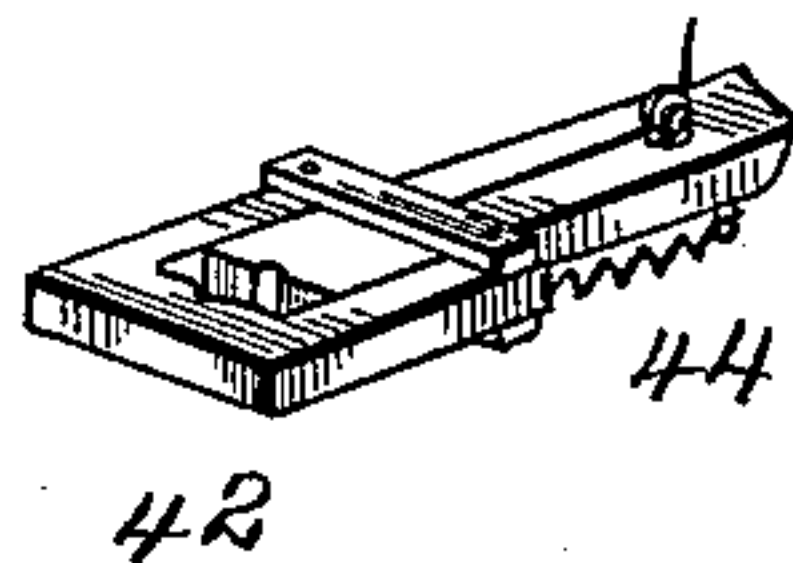
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UNITED STATES PATENT OFFICE.

GEORGE HOWLETT DAVIS, OF WASHINGTON, DISTRICT OF COLUMBIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 560,572, dated May 19, 1896.

Application filed October 2, 1894. Renewed April 27, 1896. Serial No. 589,329. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HOWLETT DAVIS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a certain new, useful, and valuable Improvement in Electrical Type-Writing Machines, of which the following is a full, clear, and exact description.

My present invention relates to improvements in electrical type-writing machines, and has for its objects, first, to provide a simple, practical, and economical construction and arrangement of electrical magnets which when energized operate the type-bars with greater speed and regularity than can be done by the force of the hand alone; second, to provide an ingenious keyboard which is perfectly adjustable in every particular, unlikely to get out of order, and effecting the energization of any independent magnet or series of magnets by the slightest pressure upon the respective keys; third, to provide a peculiar letter-spacing mechanism which is adapted to drive the carriage forward a letter-space upon each full movement of any type-bar or upon operating the spacing-lever or key; fourth, to provide a particularly novel and effectual mechanism whereby by touching a key the carriage is automatically returned or shifted and at the same time the platen-roller revolved and the line-spacing effected; fifth, to so construct and arrange the mechanism performing their several functions as to render the machine in its entirety even less complicated or likely to get out of order than an ordinary type-writing machine, and which in use will prove far less laborious to operate, permit more rapid writing, produce perfectly uniform work, and otherwise prove more efficient than an ordinary mechanical machine. I accomplish these ends by the mechanism illustrated in the several sheets of accompanying drawings, in which—

Figure 1 is a perspective view of my complete machine, showing its general appearance and the relative positions of nearly all its parts. Fig. 2 is a transverse sectional view. Fig. 3 is an enlarged detailed view of one form of key and contact. Fig. 4 is a modified form of the same. Fig. 5 is a view of the under side of the keyboard. Fig. 6 is a

diagrammatic view showing the several circuits connected to the keyboard. Fig. 7, Sheet 3, is a rear elevation of the machine. Fig. 8 is an enlarged detailed view showing a part of the letter-spacing mechanism. Fig. 9 is a perspective view showing the general construction and relative positions of the co-operating parts of the mechanism for line-spacing and returning carriage. Fig. 10 is an enlarged view of the free end of the armature-lever 37, showing the clutch. Fig. 11 is a modified form of mechanism to be used in connection with my improved pawl, instead of the rod provided with downwardly-projecting pins 30.

I will give a particular and detailed description of the several parts of the machine which are novel, and which parts are specifically pointed out in the claims concluding this specification, while to such parts of the machine as are old and which I have found necessary to show in order to better describe my improvements I shall describe only so far as they affect the operation of the novel parts.

I am fully aware that electrically-operated type-writers are not entirely new, but their construction heretofore has embodied such complicated, impractical, and expensive elements as to render them undesirable for general use, which is evidenced by the fact that up to this time there is no electrical type-writing machine on the market. Furthermore, my improvements are such that they may be applied to nearly any make of type-writing machine, and I have chosen in this instance to show them as applied to a Remington type-writer.

Similar numerals of reference indicate corresponding parts throughout the several views.

The standards 1, the plate 2, the carriage 3, having the roller 4, handle 5, frame 6, &c., together with the basket 7, and fulcrumed type-bars 8, are all of a well-known construction and do not form a part of this invention.

I provide a base-board 9, preferably of hard wood and having a circular opening 10, directly under and about the size of the basket 7. Around this opening is circumferentially arranged a series of magnets 11, the inner ends 12 of the armatures 13 of which are piv-

otally connected to the lower ends of the rods 14, which are connected at their upper ends to the type-bars 8 near their fulcrum, as clearly shown at Fig. 2.

5 Each type-bar is connected to its respective magnet in the manner described, so that whenever said magnet is energized its armature 13 instantly pulls down the rod 14, causing the type-bar 8 to be raised at its inner end, and its
10 type or character impinges and prints through a ribbon upon the paper upon roller 4.

The energization of any particular magnet is effected whenever one of the series of keys 15 with which said magnet is in circuit is depressed slightly, so as to cause the free end of the spring 16 to come in contact with the metallic frame 17, completing the circuit therethrough, as shown at Fig. 6. The said frame 17 is hinged upon a bar which is supported by uprights or standards secured to the base-board 9, as is also the board 18, through which the said keys 15 work, and to the under side of which are secured the said contact-springs 16. The said frame 17 and
20 board 18 may be independently or conjointly raised to a vertical position, thus taking up but little room when folded up, and permitting them to be conveniently separated whenever it is desired to examine the connections.
30 By means of the arm 19 working in the rack 20 the key-board, consisting of said frame 17 and board 18, may be adjusted at any angle to suit the operator by simply moving the lower end of said arm 19 in or out on said rack 20.
35 To the lower edge of said board 18 is hinged the spacing-bar 21, which when depressed forms a contact with the piece 22, thus completing the circuit through the rear magnet 23, operating the letter-spacing double pawl 24,
40 while when one of the keys 15 is depressed the circuit is also completed through this rear magnet 23, as well as through the one of the type-magnets 11 in circuit with said key, as will be understood from a study of the diagram of the circuits shown at Fig. 6.

The double pawl or escapement 24, arranged upon the upper end of arm 25, is normally kept pressed outward against the spring 26, and is pressed inward whenever any one of
50 the keys 15 or the spacing-bar 21 is depressed, owing to the inward movement or attraction of the armature 27 thus caused. The pawl-teeth 27^x and 28 alternately engage with each of the downwardly-projecting pins or teeth
55 30, first the tooth 28 forcing a pin forward a half letter-space and slightly beyond the point of tooth 27^x, which in its next forward movement drives the pin forward another half letter-space and thus permits the tooth 28 to engage with the next pin to the left, as looked
60 at from the rear, when the same action is repeated upon the energization of the magnet 23. By this peculiar pawl the carriage may be driven against a spring instead of feeding

toward a spring, as in most writing-machines, 65 and when operating against a spring or weight the spring-catches 31 32 (see Fig. 7) are employed to engage with and prevent the pins 30 from receding whenever they are driven forward a half letter-space by the alternate action of the teeth 27^x and 28. 70

The carriage-returning mechanism consists of the chain or cord 33, connected to the rear end of the line-spacing arm 34, passing loosely through a pulley at 35 and at 36 through the end of armature-arm 37, and around a spring-drum 38, which drum may be adjusted as to only wind up the slack of the chain, or it may be set to exert a considerable backward pull upon the carriage, so that by simply releasing the rack the carriage is drawn back to the extreme right; but I prefer to adjust the drum 38 with only a slight tension and employ a magnet 39, which when a circuit is completed through it by pressing down the key 40 the armature 37 descends, biting and pulling the cord 33, which first pulls down the arm 34 and revolves the plate 44 one or two notches, according as the regulating-arm 41 is set, and immediately after which the entire pull of the armature-lever 37 is exerted upon the cord 33 and serves to quickly jerk the carriage into motion, whereby it rides freely on its support, and this action, assisted by the slight tension exerted by the drum 38, carries the carriage
95 back to the extreme right, ready for another line. The biting of the cord 33 is effected in the commencement of the downward movement of the armature 37, owing to the inward pull upon the sliding end 42 by the spring 43 overcoming the spring 44, which keeps said sliding end 42 normally pressed outward or open. 100

It will be understood that the rod carrying the pins 30 is mounted on a rocking frame, as is usual in type-writers now in use, and by simply tilting or pressing down the forward portion of said rocking frame the rear portion or pin-rod is raised, thereby freeing said pins from the escapement or pawls 27^x and 28 and allowing the carriage to return to its starting-point. In my invention the pin-rod is raised out of engagement with the pawls by means of the end of the arm 34 coming in contact with the forward portion of the rocking frame during its downward movement exerted by the pull on the cord or chain 33 by the armature-lever 37 when the key 40 is depressed. 110 115

In order to regulate the strength of the series of type-magnets, I employ in circuit therewith a resistance-box 45, which, by simply turning its handle 46, regulates the impression—i. e., if considerable impression or a hard stroke is desired for manifolding the handle 46 would be turned so as to cut out all the resistance. 120 125

Instead of employing the form of contact-keys 15 I may employ that shown at Fig. 4,

in which the index part 47 is fixed to the part 48, which, when depressed, contacts with the under spring 49, thus completing the circuit.

Many minor changes may be made without avoiding the spirit of my invention, as

What I claim is—

1. In an electrical type-writing machine, the combination with the frame thereof, of an electrically-connected supporting-frame suitably hinged in front of said type-writer frame, a hinged keyboard located above the supporting-frame, and a series of electrically-connected keys carried by the keyboard, said keyboard and its supporting-frame being adapted to be folded upward, substantially as described.

2. In a type-writing machine, the combination with the frame thereof, of a keyboard-frame suitably hinged in front of said type-writer frame, and a hinged keyboard supported by the keyboard-frame, said keyboard and its supporting-frame being hinged at a point below the top of the type-writer frame and adapted when not in use to be folded upward against and supported by said latter-named frame, substantially as described.

3. In a type-writing machine, the combination with the base thereof provided with upwardly-projecting standards, a rod connecting the upper ends of said standards, a metallic frame hinged to the rod, and a keyboard hinged to the rod above the frame, said keyboard and frame being adjustably-supported.

4. In an electrical type-writing machine, the combination with the base thereof provided with standards, a rod journaled in said standards, an electrically-connected metallic frame hinged to the rod, and forming electrical contacts, a keyboard hinged to the rod and adapted to rest on the metallic frame, a series of electrically-connected keys arranged on the keyboard, and adapted when depressed to complete an electric circuit, substantially as described.

5. In an electrical type-writing machine the combination with the base thereof, provided with standards, a rod connecting said standards, an electrically-connected metallic frame hinged to said rod, cross-bars on said frame, a keyboard hinged to the rod above the metallic frame, a series of keys arranged in apertures in said keyboard, and a series of electrically-connected contact-springs secured to the under side of the keyboard and adapted when depressed to complete an electric circuit as and for the purpose described.

6. In an electrical type-writing machine, the combination with the movable carriage, of a cord or chain connected to said carriage, an electromagnet and armature, a clutch-block sliding upon the end of said armature, and springs for controlling the movement of the clutch-block, said cord or chain passing between the armature and clutch-block and

adapted to be grasped thereby, as and for the purpose described.

7. In an electrical type-writing machine, the combination with the movable carriage, of a cord or chain connected to said carriage, an electromagnet and armature, and a clutch at one end of said armature adapted to grasp the chain or cord when the electromagnet is energized, as and for the purpose described.

8. In an electrical type-writing machine, the combination with the carriage and platen, a lever for rotating said platen, a cord connected to the rear end of said lever and to the carriage, a drum around which the other end of said cord is wound, an electromagnet and armature-lever therefor, and a clutch on the end of the armature-lever, adapted to grasp and impart a sudden jerk to the carriage and platen-lever, when the magnet is energized, substantially as described.

9. In an electrical type-writing machine, the combination with the movable carriage provided with a rack-bar, of a double-toothed pawl, having inclined teeth, adapted to engage with the rack-bar, and an armature-lever adapted to vibrate the pawl, whereby the rack-bar and carriage are advanced substantially as described.

10. In an electrical type-writing machine, the combination with an adjustable keyboard, of a series of circumferentially-arranged electromagnets adapted to operate the type-levers, a movable paper-carriage and platen provided at its rear portion with a bar provided with downwardly-extending pins, an electrically-operated double-toothed pawl adapted to advance the paper-carriage, a lever for rotating the platen, a cord connected to one end of said lever and passing over a pulley on the pin-rod, a spring-drum connected to the base of the machine and around which the opposite end of the cord is wound, an armature-lever located intermediate the two ends of said cord and below the pin-rod, and a clutch on the end of said armature-lever adapted to grasp the cord, as and for the purpose described.

11. In an electrical type-writing machine, the combination with the movable carriage provided with a toothed bar of a spring-pressed vibrating arm journaled at its lower end to the machine-frame below the toothed bar, a pair of wedge-shaped teeth mounted upon the upper end of said arm and engaging with the toothed bar, an electromagnet and armature-lever arranged to vibrate the arm and feed the carriage forward, and spring-catches acting upon the toothed bar, as and for the purpose set forth.

12. In an electrical type-writing machine, the combination with the movable carriage provided at its rear portion with a toothed bar, of a vibrating arm journaled at its lower end to the machine-frame, a pair of wedge-

shaped teeth arranged slightly in advance of
each other and mounted upon the upper end
of the vibrating arm, an armature-lever ar-
ranged upon the rear of the machine-frame
5 and acting to vibrate the arm, a spring ar-
ranged upon the lower end of the arm and
adapted to normally keep the latter in con-
tact with the armature-lever, and spring-
catches engaging the toothed bar and adapted
10 to hold the carriage against backward move-

ment when the latter is being fed forward by
the double-toothed pawl, substantially as de-
scribed.

In testimony whereof I affix my signature
in presence of two witnesses.

GEORGE HOWLETT DAVIS.

Witnesses:

WM. F. LETT,

CHAS. T. DAVIS, Jr.