

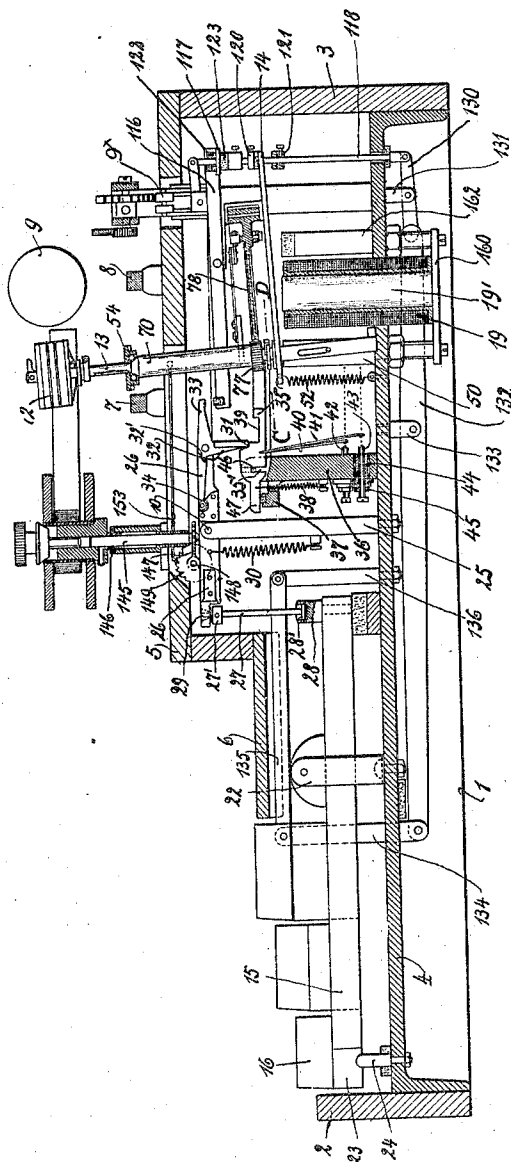
O. FISCHER.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 26, 1910.

Patented Dec. 30, 1913

4 SHEETS—SHEET 1.

1,083,076.

Fig. 1.



Witnesses:

M. Hamilton
Albert Hamilton

Inventor:

Oskar Fischer
by his attorneys
M. Hamilton & Hamilton

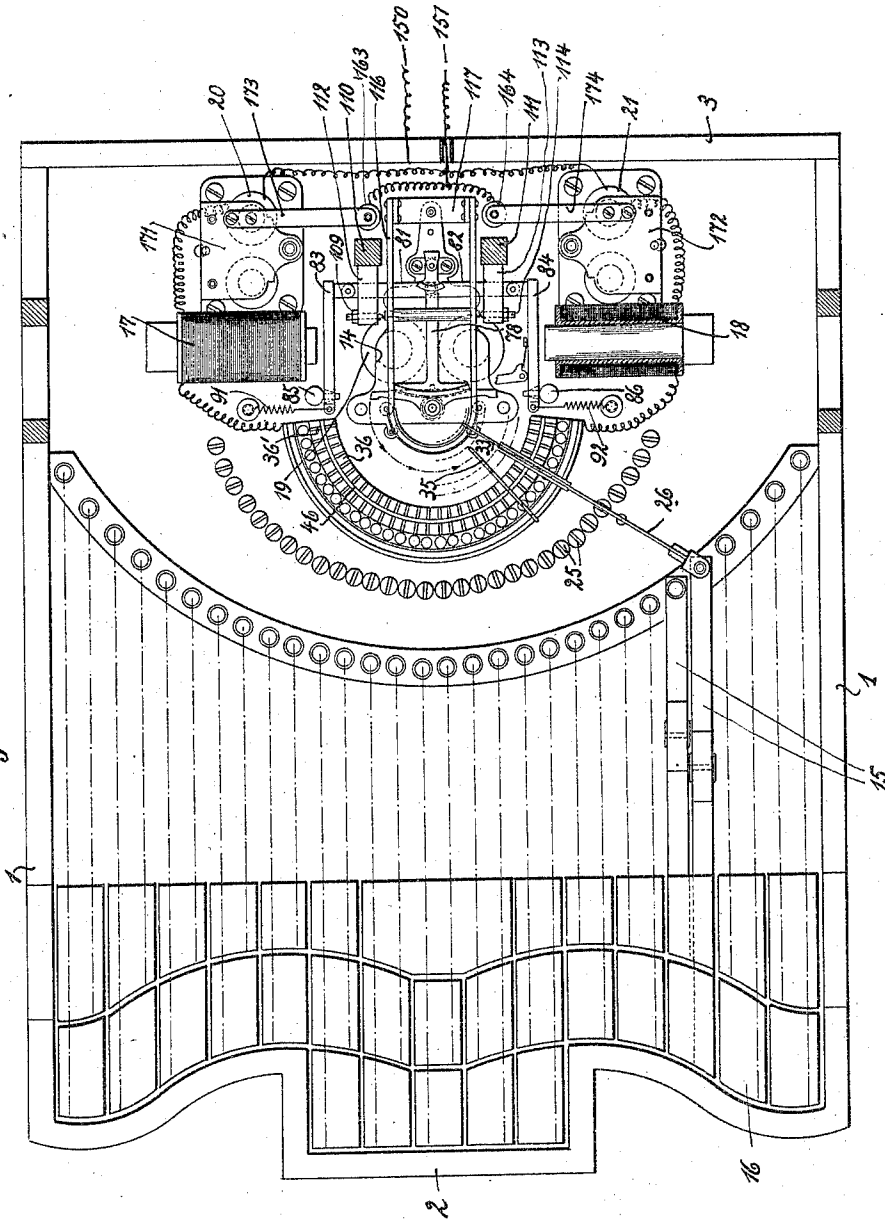
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4 SHEETS—SHEET 2.

1,083,076.

Fig. 2.



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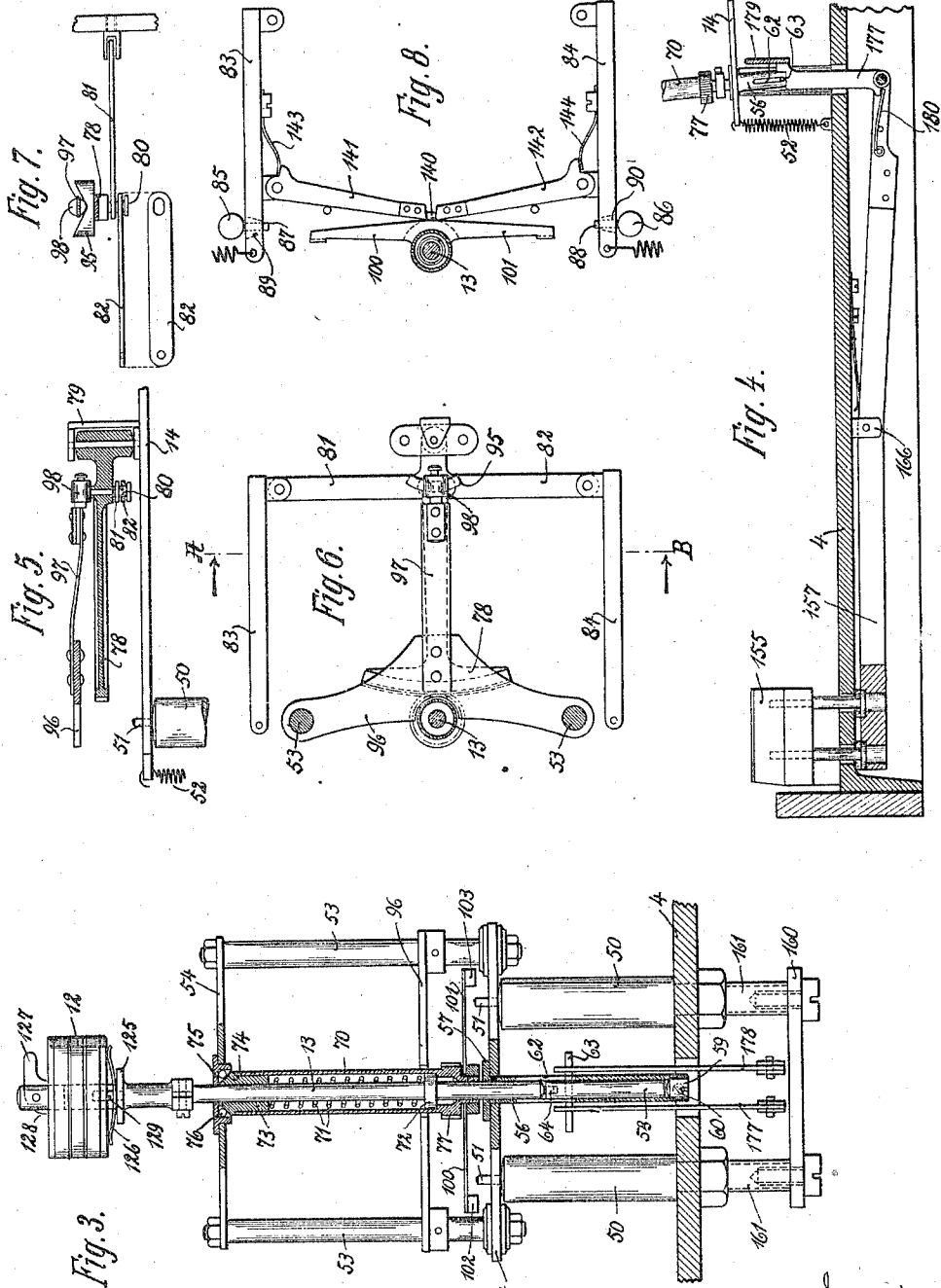
Oskar Fischer
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4 SHEETS—SHEET 3.



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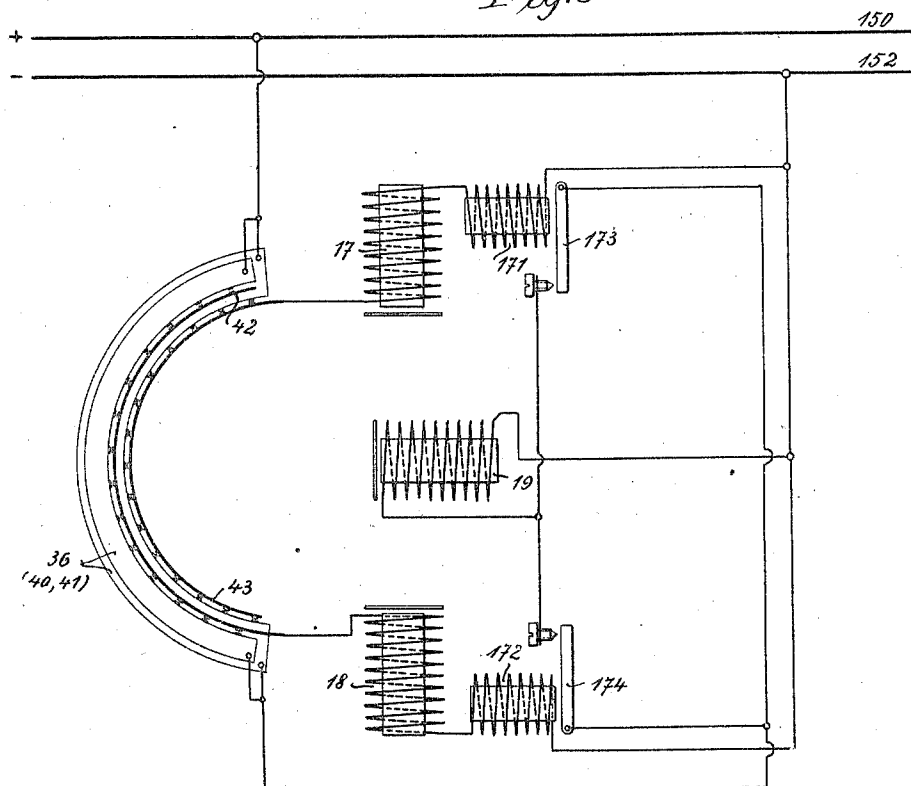
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TYPE WRITING MACHINE.
APPLICATION FILED APR. 26, 1910.

1,083,076.

Patented Dec. 30, 1913.

4 SHEETS—SHEET 4.

Fig. 9.



Witnesses:

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UNITED STATES PATENT OFFICE.

OSKAR FISCHER, OF BERLIN, GERMANY.

TYPE-WRITING MACHINE.

1,083,076.

Specification of Letters Patent.

Patented Dec. 30, 1913.

Application filed April 26, 1910. Serial No. 557,700.

To all whom it may concern:

Be it known that I, OSKAR FISCHER, a subject of the King of Prussia, and resident of Schöneberg, Berlin, Germany, (whose post-office address is Berlin W. 30, Barbarossastrasse 30,) have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in typewriting machines, and more particularly to that class of typewriting machines in which the types are disposed on a type wheel which by striking a key is first turned about its longitudinal axis so as to bring the type corresponding to the depressed key in position in front of the printing point, whereupon the type-wheel is thrown against the platen.

One of the objects of the improvements is to provide a machine of this character which permits of an exceedingly rapid operation. For this purpose the connection between the keys and the type wheel is such that after printing the type wheel is automatically returned into its normal position independently of the return movement of the keys. Therefore it is not necessary to release the key before striking the next one.

My invention also relates to certain details of construction to be described hereinafter and particularly pointed out in the appended claims.

While for the purpose of explaining the invention reference has been made to a particular embodiment of the same, I wish it to be understood that my invention is not limited to the construction illustrated, and that various features of the invention may be embodied in machines of different construction.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings, in which the same letters of reference have been used in all the views to indicate corresponding parts.

In said drawings—Figure 1, is a vertical longitudinal section of the machine, Fig. 2, is a plan of the same partly in section, Fig. 3, is a vertical cross-section of the type wheel and its supporting frame, Fig. 4, is a side view of one of the shift key levers and its

connection with the type wheel, Fig. 5, is a vertical longitudinal section of the segment through which rotation is imparted to the type wheel, Fig. 6, is a plan of the said segment, Fig. 7, is a vertical cross-section of the segment taken on the line A—B of Fig. 6, Fig. 8, is a horizontal section of a part of the machine taken on the line C—D of Fig. 1. Fig. 9 is a diagram of the electrical circuits.

Referring to the example of the invention illustrated in the drawings, the operative parts of my improved typewriting machine are mounted on a frame which consists of side members 1, 1, a front member 2, a rear member 3, a horizontal base plate 4, an upper top plate 5, and a lower top plate 6 located in front of the plate 5. To the top plate 5 suitable slide bars 7 and 8 are secured which provide a support for the carriage (not shown) of the platen 9. A rotatable type wheel 12 is secured to a substantially perpendicular rotary shaft 13, and the latter is mounted on a rocker plate 14 which also carries the mechanism for rotating the wheel 12 according to the type to be printed, and which is adapted after thus positioning the type wheel to be rocked so as to throw the type wheel against the platen. Such positioning and rocking movement is derived from key levers 15 provided with operating members such as keys 16 and cooperating with electromagnets 17 and 18 for rotating the type wheel in either direction, an electromagnet 19 for actuating the rocker plate 14 and thereby throwing the type wheel against the platen, and subsidiary electromagnets 20 and 21 for throwing the electromagnet 19 into operation.

The key levers 15 are pivotally mounted on brackets 22 rising from the base plate 4, and their keys are arranged in pairs behind each other by projecting laterally over the adjacent key lever. Thereby the operator is enabled after striking a key of the higher or rearmost row of keys to strike the adjacent key of the lower or front row by merely shifting his finger toward the front side of the machine, and such operation is made possible in my improved machine, because before striking a second key it is not necessary to first release the key which has before been struck, as will be explained hereinafter. In the preferred form the various letters are so arranged on the keys, that pairs of keys which are located one be-

hind the other represent letters which are combined to form the most common syllables. For example, it may be advisable to arrange the letter "r" directly at the rear of and above the letter "i," so that for writing the syllable "ri" the operator shifts his finger from the "r" key forward over the "i" key. Obviously the speed of writing is thereby greatly increased. At their front ends the key levers are formed with longitudinal slots 23 engaged by pins 24 rising from the plate 4 and providing suitable guides for the said levers.

At the rear of each key lever a perpendicular pillar 25 rises from the base plate 4, and in a slot formed at the upper end of the said pillar a substantially horizontal rocking lever 26 is mounted on a pivot pin 10. The said lever is connected with the cooperating key lever 15 by a push rod 27. With its lower end the latter engages in a socket 28' of a block 28 secured to the key lever. At its upper end it is formed with an enlarged portion 27' which bears below the rocking lever 26, and with a pin 29 which extends through an outwardly flaring hole of the rocking lever 26. A spring 30 tends to pull the front end of the lever 26 downward, so that the push rod 27 is in engagement with the block 28 as well as with the lever 26. At its rear end the lever 26 carries a bell crank lever 32, 33. By a spring 34 engaging under a nose 32' the downwardly extending arm 32 is normally pressed forward and in engagement with a shoulder 31 formed on a rocker 35. It will be understood that for each key lever a push rod 27, rocking lever 26, bell crank lever 32, 33, and rocker 35 are provided. All the rockers 35 are mounted on a substantially semicircular plate 36 which rises from the base plate 4 and which is formed at its upper margin with a plurality of slots 36' the number of which corresponds to the number of the rockers 35. The latter are formed with slits 35' whereby they are pivoted on a semicircular wire 46 extending through the plate 36 at the upper end of the same. Normally the rear ends of the rockers are thrown upward by means of springs 38 attached to forward extensions 47 of the rockers and holding the latter in contact with a flange 37. At their rear ends the rockers are formed with notches 39 which permit the same to be rocked upward relatively to the arms 32 when the latter are released from their shoulders 31, as will be described hereinafter. Each of the rockers 35 has a flat spring 40 or 41 secured thereto which extends downward and with its lower end at the rear of a contact pin 42 or 43 screwed into an insulating sleeve 44 located in a bore at the lower end of the plate 36. The contact pins are adjustable within their sleeves by means of their screw threads

and they are provided with locking nuts 45. As shown, the contact pins are arranged in two groups one above the other and all the contact pins of each group are electrically connected with one another.

To the base plate 4 two perpendicular pillars 50 (Figs. 1 and 3) are secured which are rounded at their upper ends and provided with pins 51. The said pillars provide a pivotal support for the rocker plate 14 and the pins 51 extend through outwardly flaring holes of the said rocker plate. To the front end of the rocker plate two springs 52 are connected which at their lower ends are attached to the base plate 4, and which tend to hold the rear end of the rocker plate upward and away from the core 19' of the electromagnet 19. Outside the pins 51 a pair of pillars 63 are secured to the rocker plate 14 which extend upward therefrom and are bridged at their upper ends by a cross plate 54. The said cross plate provides an upper guide for the shaft 13 of the type wheel which at its lower end is guided in a bore of the rocker plate 14. As shown in Fig. 3 the shaft 13 of the type wheel is mounted on the rocker plate 14 as follows: Through a central bore of the rocker plate a sleeve 56 extends downward, which at its upper end is formed with a flange 57 whereby it is secured to the plate by means of screws. Within the said sleeve a slide pin 58 is located which with its lower end bears on a screw plug 59 adapted to be adjusted longitudinally of the sleeve by means of a screw driver and to be locked in adjusted position by a locking screw 60. At its upper end the slide pin 58 is provided with a transverse pin 63 which projects laterally through longitudinal slots 62 of the sleeve 56 and provides a means to shift the type wheel so as to bring either one of its rows of types in front of the printing point, as will be explained hereinafter. The pin 58 is further formed with a longitudinal bore 64, which provides a guide and a support for the lower end of the type wheel shaft 13. Above the rocker plate 14 the shaft 13 is guided in a sleeve 70, in which it is longitudinally slidable, while it takes part in the rotary movement of the same. Within the latter a coiled spring 71 is inclosed which with its lower end bears against a collar 72 formed on the shaft 13 and with its upper end against a screw plug 73 screwed into the sleeve 70. The said spring has a tendency to force the shaft downward, so that normally the upper row of types is in front of the printing point. The plug 73 is formed with a beveled upper face 74, and the said face is adjacent to a cap 75 secured to the cross plate 54. Between the latter and the beveled face 74 balls 76 are interposed. Near the lower end of the sleeve 70 gear teeth 77 are cut into

the same (Figs. 5 and 6), and the said gear teeth are in mesh with corresponding teeth of a segment 78 having a pivotal support in a bracket 79 secured to the rocker plate 14.

5 Near the fulcrum of the segment 78 a pivot pin 80 extends downward and to the said pivot pin two links 81 and 82 are jointed which extend laterally to both sides of the machine and are jointed at their free ends to armatures 83 and 84 of the electromagnets 17 and 18. The said armatures have a rocking support on pillars 85 and 86 respectively, which rise from the base plate 4. For this purpose the said pillars are provided with horizontal studs 87 and 88 which engage in outwardly flaring bores 89 and 90 of the armatures. Springs 91 and 92 tend to pull the armatures away from their electromagnets. If however one of the said 20 electromagnets is energized, as will be explained hereinafter, the corresponding armature is attracted and thereby the toothed segment 78 is rocked, and such rocking movement is transmitted through the pinion 77 and the sleeve 70 to the shaft 13 of the type wheel, until the latter is arrested in the position in which the proper type is in front of the printing point.

Above the pivot 80 a block 95 is secured 30 to the upper side of the rearwardly-extending arm of the segment 78, and the said block is formed with a notched upper face the side faces of the said notch being inclined downward and toward the center of the block. At a point above the pinion 77 a transverse plate 96 is secured to the pillars 53 and to the said plate a flat spring 97 is secured which extends rearward therefrom and to a point near the block 95. At its rear 40 end and above the block 95 the said flat spring is provided with a roller 98 which runs on the inclined upper face of the block 95. Normally the said roller engages the lowermost or central part of the notch of the block. But when the segment 78 has been rocked it rides up one of the inclined side faces, and it tends to return the segment into its normal position.

At a point below the pinion 77 a stop 50 member (Figs. 3 and 8) is secured to the sleeve 70 which consists of two arms 100 and 101 projecting laterally of the said sleeve toward the sides of the machine. At their outer ends the said arms are formed with shoulders 102 and 103 which project downward from the said arms. Upon rotation of the sleeve 70 the said shoulders are adapted to strike against the rear end of the rocker 35 which has been depressed into the path of the said shoulders by depressing a key. The sleeve 70 constitutes a hollow rock-shaft while the arms 100 and 101 are rocker-arms projecting therefrom.

At points near the rear end of the machine two pillars 110 and 111 extend up-

ward from the base plate 4 from which arms 112 and 113 project forward. At their front ends the said arms are equipped with pivot pins 114 which are screwed through 70 holes of the said arms and are formed with conical points. The said pivot pins can be adjusted within their holes and locked in adjusted position by means of locking nuts 109. The conical ends of the pins provide a pivot for a frame which consists of a U- 75 shaped bar 116 which at its front end is bent into a semicircular bow and has its rear ends bridged by a transverse plate 117. The curved front part of the said frame is disposed adjacent to and below the rearwardly 80 extending arms 33 of the bell crank levers 32, 33, and it provides a means to disconnect the key levers from the type wheel operating mechanism, as will be explained hereinafter. The transverse plate 117 is formed 85 with a central bore through which a rod 118 extends. The said rod also extends through a bore formed at the rear end of the rocker plate, and further through a bore of the base plate. The function of the rod is to transmit the rocking movement of the rocker plate 14 to the platen-feed escapement mechanism 9* and to the frame 116, 117. For this purpose collars 120 and 121 are secured thereto above and below the rocker plate 95 and at a suitable distance from each other and two collars 122 and 123 are secured thereto above and below the transverse plate 117. At its lower end the rod 118 is jointed to a rocking lever 130 which is pivotally 100 supported on a bracket 131 depending from the base plate 4. At its front end the said rocking lever is jointed to the rear end of a rocking lever 132 which is pivotally supported on a bracket 133, and which is connected by a link 134 to a space key lever 135. 105 The latter is pivoted on a pillar 136 rising from the base plate 4.

From the hub of the lever 100, 101 a stud 140 projects rearward which provides an 110 abutment for securing an exact adjustment for the type wheel when the latter is turned backward into its normal position. The said stud coöperates with a pair of pawls or rocking levers 141 and 142 pivotally 115 mounted on the armatures 83 and 84 respectively. Springs 143 and 144 have the tendency to hold the said levers in their normal or locking positions.

At the rear of the machine two contacts 120 150 and 151 are provided which are adapted to be connected to a suitable source of electric energy. From the said contacts electrical connections are made as follows: From the contact 151 to the subsidiary elec- 125 tromagnet 21, the type-wheel-rotating electromagnet 18, the lower series of contacts 43, the spring contacts 41, the machine frame and back to the contact 150. In a similar way connection is made from the contact 130

151, the subsidiary electromagnet 20, the type-wheel-rotating electromagnet 17, the upper series of contacts 42, the spring contacts 40, the machine frame and back to the contact 150. It will be understood, that normally the said circuits are broken, because the spring contacts 40 and 41 are away from their contacts 42 and 43.

The impression controlling or printing electromagnet 19 which coöperates with the rocker plate 14 to throw the type wheel against the platen is mounted on a plate 160 secured to the base plate by means of suitable rods 161. At the rear of the electromagnet a pillar 162 is provided which provides a stop for the rocking movement of the rocker plate 14. The electromagnet 19 is energized by means of a circuit which is normally broken at the contacts 163 and 164, and which is closed by energizing either one of the subsidiary electromagnets 20 or 21. The latter are mounted on the base plate 4. Their armatures 171 and 172 are provided with contact levers 173 and 174. If now by depressing a key, either one of the subsidiary electromagnets 20 or 21 is energized, as has been described above, the circuit of the electromagnet 19 is closed at the corresponding contact 163 or 164. Thereby current is supplied to the electromagnet 19 as follows: from the contact 150 over the machine frame to the contact lever 173 (or 174), the contact 163 (or 164), the electromagnet 19, and the contact 151. The electrical circuits and connections are shown diagrammatically in Fig. 9. By thus energizing the electromagnet 19 the rocker plate 14 is attracted and the type wheel 12 thrown against the printing point.

The operation of the machine is as follows: If a key is depressed, the corresponding rocker 35 is moved downward through the intermediary of the key lever 15, the push rod 27, the rocking lever 26, and the depending arm 32. Thereby instrumentalities for positioning the rotary type-carrying member 12 to bring the desired character into position for printing are brought into action and the rear end of the rocker is shifted into the path of the lever 100, 101 secured to the sleeve 70 of the type wheel shaft. Furthermore the corresponding spring contact 40 or 41 is pressed against its contact 42 or 43 of the upper or lower series of contacts. Thereby either one of the type-wheel-rotating electromagnets 17 or 18 is energized, and the corresponding armature 83 or 84 is attracted. The said armature rocks the segment 78 by means of the link 81 or 82 either to the right or left, and such rocking movement is transmitted to the sleeve 70, so that the latter and the type wheel connected therewith are rotated either to the right or to the left. Such rotary movement is possible, because

by the rocking movement of the armature 83 or 84 the lever 141 or 142 has been rocked out of the path of the stud 140 secured to the sleeve 70 of the type wheel shaft 13. The rotary movement of the type wheel shaft is arrested by one of the arms of the lever 100, 101, which comes in contact with the rocker 35 which has been depressed by the key. From this it follows that the rockers 35 are and constitute instrumentalities which limit the oscillating movement of the type-carrying member 12; and, since through the leaf-springs 40, 41, carried by them, they control the electrical circuit of the printing-controlling magnet 19 (as hereinafter explained) and inasmuch as they are through the bell-crank levers 32, 33, each normally connected with the key-controlled mechanism (the rocking lever 26, push-rod 27 and key-lever 15), they may be properly said to be instrumentalities which control the printing-controlling magnet 19 and are normally connected with said key-controlled mechanism and actuated thereby. It will be observed, that by using a stop member 100, 101 having two arms and rotating the sleeve 70 either to the right or left, the type wheel is turned over an angle of not more than 180 degrees to the right or to the left. Thereby it is positioned according to the key struck within a very short time. While the type wheel is thus being positioned, the subsidiary electromagnet 20 or 21 is energized and either one of the contacts 163 or 164 is closed, so that current is supplied to the printing or impression-controlling electromagnet 19. Thereby the rocker plate 14 is attracted and the typewheel thrown against the platen. By using the subsidiary electromagnets 20 or 21 for energizing the electromagnet 19, some time elapses, as is necessary for rotating the typewheel before throwing the same against the platen. By the rocking movement of the rocker plate 14 the frame 116, 117 is rocked by the rod 118 and the escapement mechanism is actuated, so that the carriage is shifted one space. By the rocking movement of the frame 116, 117 the crank lever 32, 33 is rocked away from the shoulder 31 of the rocker 35, so that the latter is free to move into its upper or inoperative position under the influence of its spring 38. An important feature of the invention consists in the manner in which the connection between the type wheel operating mechanism and the key levers is broken. In order to permit of a rapid operation of the machine, I deem it advisable, that the stroke of the type wheel whereby it is thrown against the platen be as small as possible, because a large stroke would require considerable time. However, in order to be able to throw the type wheel against the platen with sufficient force as to produce

sharp impressions, it is necessary, that the said type wheel be under the action of the electromagnet 19 as long as possible, and as far as possible, until the type wheel strikes against the platen. It will be remembered that the rocking movement of the rocker plate 14 has also the function to disconnect the type wheel mechanism from the key lever mechanism. When the type wheel has come in contact with the platen, the whole mechanism will be at rest. It is therefore necessary, that the disconnection of the said mechanisms be effected before the type wheel strikes against the platen, but while the electric circuit is not yet broken. This is made possible by the spring contacts 40 and 41. An inspection of Fig. 1 will show, that by the rocking movement of the frame 116, 117 the bell crank lever 32 of the key which in each operation has been struck is rocked, and thereby the said disconnection is effected. This disconnection is made a suitable time before the type wheel strikes against the platen. But while the rocker 35 is being rocked into its upper or inoperative position, the spring contact 40 or 41 will still be held in engagement with its contact 42 or 43, and the adjustment may be such that they will not be separated, until the type wheel strikes against the platen or shortly before this moment. Therefore, while the disconnection of the type wheel mechanism and the key lever mechanism is effected in a reliable way, yet the force for throwing the type wheel against the platen lasts long enough to insure a good impression. It will be understood that the same effect may be obtained by other means. For example the cores of the electromagnets 20, 21 may be so constructed as to have some remanence or residual magnetism, so that their armatures are not instantaneously released, and the circuit of the printing electromagnet 19 broken.

From the foregoing description, it is obvious that each rocker 35 is in effect a make-and-break device or a circuit-breaking device which is controlled by the U-shaped lever 116, which lever in turn is controlled by the printing-controlling magnet 19; and as will be obvious from what has been said in the foregoing, the rocker 35 is controlled by the U-shaped lever 116 in such a way as to interrupt the circuit independently of the return movement of the key. When the rear end of the rocker 35 is thrown down by the key-controlled mechanism (the lever 26, push-rod 27 and key-lever 15) with which it is connected through the bell-crank lever 32, the circuit is closed or made and the rear end of the rocker 35 is interposed in the path of the rocker-arms 100, 101 for limiting the oscillating movement of the type-wheel 12 to bring the desired character into printing position.

As soon as in the example shown the contact spring 40 or 41 has been retracted from its contact 42 or 43 all the electromagnets release their armatures, so that the type wheel is rotated into its normal position by the spring 97 engaging on the inclined faces of the block 95, in which position it is arrested by the spring lever 141 or 142. When the type wheel arrives in its normal position, the armature 83 or 84 has of course been released and rocked into its normal position, and also the locking lever 141 or 142 has been brought into its normal position. However, the said locking lever will not prevent the type wheel from moving into its normal position, because it yields to the stud 140 by being spring actuated and pivotally supported on the armature 83 or 84. The rocker plate 14 will be released by its electromagnet 19 and retracted into its normal position by its springs 52. It will be understood that all the operations are performed whether the key has been released or not, and that a second key can be struck without first releasing the key which has first been depressed.

As shown in the drawings, the type wheel is provided with three rows of types, and accordingly two shift keys 155 and shift key levers 157 are provided. The said shift key levers have a rocking support on brackets 166 secured to the lower face of the base plate 4. At their rear ends the levers are jointed to perpendicular links 177, 178 which with their upper faces are in loose engagement with the projecting ends of the pin 63. At the rear of the pin 63 there is a guide plate 179 for the links 177 and 178, and the latter are pressed in engagement with the said plate by springs 180. The shift key levers 157 have a different range of movement, so that they will elevate the type wheel with either one of its lower rows of types in front of the printing point.

Novel means have been provided to enable the operator to speedily remove his type wheel from the shaft and to put thereon another one which may be provided with types of a different character. As shown such means are constructed as follows: Near its upper end the shaft 13 is formed with a collar 125 which provides a suitable support for the type wheel. Above the said collar a pair of spring arms 126 are secured to the shaft 13 which tend to shift the type wheel away from its seat on the collar 125. At its upper end the shaft 13 carries a pivotal cam 127 which in the position shown in Fig. 8 bears with its nose 128 on the upper face of the type wheel and presses the same downward and in contact with the collar 125. If the said cam is rocked its nose is retracted into the slot of the shaft, so that the wheel can be removed from its shaft. To prevent rotation and insure exact ad-

justment of the type wheel on its shaft a pin 129 is provided on the collar which engages in a corresponding bore of the type wheel.

5 Novel means are provided to actuate the ribbon spool mechanism and thereby to control the feed of the ribbon. As shown in Fig. 1, the ribbon spool is mounted on a spindle 145 guided in a suitable sleeve 146
10 rising from the upper top plate 5 of the machine. Near its lower end a worm gear 147 is secured to the spindle 145, and the said gear is in engagement with a worm 148 mounted below the plate 5. The worm shaft
15 has a ratchet wheel 149 secured thereto which is adapted to be actuated by a spring pawl 153 secured to the frame 53, 54. Therefore each rocking movement of the type wheel will advance the ribbon spool mechanism one step.

I claim:

1. A typewriting machine comprising a rotary type-carrying member; instrumentalities for positioning the same to bring the
25 desired character thereon into printing position; means for actuating said member to produce the printing stroke thereof; automatic means for causing the return of said member to its initial position after the impression has been made; a manually-operated device under control of the operator for
30 controlling the first-named means; and automatically-operating mechanism for disconnecting the latter from said device a substantial interval of time before the end of the printing stroke of said type-carrying member.

2. A typewriting machine comprising a rotary type-carrying member; instrumentalities for positioning the same to bring the
40 desired character thereon into printing position; means for actuating said member to produce the printing stroke thereof; automatic means for causing the return of said member to its initial position after the printing stroke has been made; a manually-operated device under control of the operator for controlling the first-named means; automatically-operating mechanism for disconnecting the latter from said device a substantial interval of time before the end of the printing stroke of said type-carrying member; and a connecting device which joins the first-named means and said mechanism together.

3. In a typewriting machine, the combination with a type-wheel, means to rotate the same, means to throw the same against the platen, and an operating member for
60 said rotating and throwing means, of means operative upon the actuation of said throwing means a substantial interval of time in advance of the type wheel striking the platen to disconnect said operating member from the rotating and throwing means, and

automatic means to return said type wheel into its normal position.

4. In a typewriting machine, the combination with a type-wheel; means to rotate the same; means to throw the same against the platen; and an operating member for
70 said rotating and throwing means; of means operative upon the actuation of said throwing means and a substantial interval of time in advance of the type-wheel striking the platen to disconnect said operating member from said rotating and throwing means and to make said throwing means thereafter inoperative by said operating member; and automatic means to return said type-wheel
75 to its initial position.

5. In a typewriting machine, the combination with a type wheel, electric means to rotate the same, electric means to throw the same against the platen, and a key-controlled operating member for said rotating and throwing means, of means operative upon the actuation of said throwing means to disconnect said operating member from the rotating and throwing means, and automatic means to return said type wheel into its normal position.

6. In a typewriting machine, the combination with a type-wheel; electric means to rotate the same; electric means to throw the same against the platen; and an operating member for said rotating and throwing means; of means operative upon the actuation of said throwing means and a substantial interval of time in advance of the type-wheel striking the platen to disconnect said operating member from said rotating and throwing means and to make said throwing means thereafter inoperative by said operating member; and automatic means to return said type-wheel to its initial position.

7. In a type writing machine, the combination with a type wheel, of electric means to rotate the same, means to throw the same against the platen, means to actuate said throwing means, an electric circuit including said electric rotating means, a contact and a spring arm cooperating with each other and included in the said circuit, a rocker providing a stop for limiting the rotary movement of said type wheel and carrying said spring arm, a key-controlled operating member for said rocker and the spring arm carried thereby, means operative upon the actuation of said throwing means to disconnect said operating member and rocker, automatic means to return said type wheel into its normal position, and automatic means to move said rocker and spring arm into normal position, said spring arm remaining in circuit closing position until after the rocker and its operating member have been disconnected.

8. In a type writing machine, the combination with a type wheel, of electric means

to rotate the same, electric means to throw the same against the platen, electric means to actuate said throwing means, a subsidiary electromagnet for operating said throwing means, an electric circuit including said electric rotating means and subsidiary electromagnet, a contact and a spring arm cooperating with each other and included in the said circuit, a rocker providing a stop for limiting the rotary movement of said type wheel and carrying said spring arm, a key-controlled operating member for said rocker and the spring arm carried thereby, means operative upon the actuation of said throwing means to disconnect said operating member and rocker, automatic means to return said type wheel into its normal position, and automatic means to move said rocker and spring arm into normal position, said spring arm remaining in circuit closing position until after the rocker and its operating member have been disconnected.

9. A typewriting machine comprising a type-carrying member; means for actuating the same to produce the printing stroke thereof; automatic means for causing the return of said member to its initial position after the printing stroke has been completed; key-controlled mechanism; instrumentalities which limit the movement of said member and control the first-named means and which are normally connected with said key-controlled mechanism and actuated thereby; and automatically-operating mechanism for disconnecting said key-controlled mechanism and instrumentalities after the actuation of the latter and a substantial interval of time before the end of the printing stroke of said type-carrying member.

10. A typewriting machine comprising a type-wheel; a shaft upon which the same is mounted; a spring interposed between said type-wheel and shaft and mounted below said type-wheel, said spring tending to push the type-wheel upwardly along the shaft; and a locking device which is pivotally mounted upon said shaft above said type-wheel and arranged to be swung in prolongation of said shaft to permit the removal of said type-wheel.

11. A typewriting machine comprising a type-wheel; a shaft upon which the same is mounted; a spring interposed between said type-wheel and shaft and mounted below said type-wheel, said spring tending to push the type-wheel upwardly along the shaft; and a locking device formed with a cam and pivotally mounted upon said shaft above said type-wheel and arranged to be swung in prolongation of said shaft to permit the removal of said type-wheel.

12. In a typewriting machine, the combination with a type wheel, electrically-operated means to rotate the same, means to

throw the same against the platen, and an operating member for said rotating and throwing means, of means operative upon the actuation of said throwing means to disconnect said operating member from the rotating and throwing means, and automatic means to return said type-wheel into its normal position.

13. In a typewriting machine, the combination with a type wheel, means to rotate the same, electrically-operated means to throw the same against the platen, and an operating member for said rotating and throwing means, of means operative upon the actuation of said throwing means and in advance of the type wheel striking the platen to disconnect said operating member from the rotating and throwing means, and automatic means to return said type wheel into its normal position.

14. In a typewriting machine, the combination with a type wheel, a rocker plate supporting the same, and means to rock said rocker plate so as to throw the type wheel against the platen, of a rotary sleeve mounted on said rocker plate and supporting said type wheel, means to rotate said sleeve and type wheel so as to bring either one of the types in front of the printing point, and means to return said sleeve and type wheel into normal position.

15. In a typewriting machine, the combination with a type wheel, a rocker plate supporting the same, and means to rock said rocker plate so as to throw the type wheel against the platen, of a rotary sleeve mounted on said rocker plate and supporting said type wheel, a pinion provided on said sleeve, a rocking segment engaging said pinion, means to rock said segment and means to return said segment into normal position.

16. In a typewriting machine, the combination with a type-wheel, a rocker plate supporting the same, and means to rock said rocker plate so as to throw the type wheel against the platen, of a rotary sleeve mounted on said rocker plate and supporting said type wheel, a pinion provided on said sleeve, a rocking segment engaging said pinion, means to rock said segment, a block having an angular notch and secured to said segment, and a spring actuated member engaging in said notch and tending to hold the same in its normal position.

17. In a typewriting machine, the combination with the platen, a type wheel, and means to throw the same against the platen, of means to rotate said type wheel, automatic means to return said type wheel into its normal position, and a locking lever adapted to be rocked out of locking position by said rotating means and to be returned into locking position upon the release of said rotating means.

18. In a typewriting machine, the combination with a type wheel, means to rotate the same, means to throw the same against the platen, and an operating member for said rotating and throwing means, of means operative upon the actuation of said throwing means to disconnect said operating member from the rotating and throwing means, and automatic means to return said type-wheel into its normal position.

nation with a type-wheel; a rock-shaft upon which the same is mounted and which is provided with a pair of rocker-arms; key-controlled devices arranged to be thrown into the path of said rocker-arms to limit the rotary movement of said type-wheel; and electromagnetic means which throw the latter in either direction to bring the desired character into printing position and which are controlled by said key-controlled devices.

19. A typewriting machine comprising a type-wheel; means for rotating the type-wheel to bring the proper character thereon into printing position; mechanism which carries said means and produces the printing stroke of the type-wheel; automatic means for causing the return of said member to its initial position after the impression has been made; a manually-operated device under control of the operator for controlling the first-named means; and automatically-operating mechanism for disconnecting the latter from said device a substantial interval of time before the end of the printing stroke of said type-carrying member.

20. An electric typewriter having a key-controlled type-wheel; a platen; electromagnetically-actuated devices for rotating the type-wheel and throwing the same against the platen to print the character; and means for causing the interruption of the magnetism-creating electric current a substantial interval of time prior to the completion of the printing stroke of the type-wheel.

21. An electric typewriter having a key-controlled type-wheel; a platen; mechanism for rotating said type-wheel; an electromagnet for actuating said mechanism; means for throwing the type-wheel against the platen to print the character; an electromagnet for actuating said means; and means for initiating the breaking of the electrical circuits of said electromagnets a substantial interval of time previous to the completion of the printing movement of the type-wheel.

22. An electric typewriter having a type-wheel; a platen; electromagnetically-actuated devices for rotating the type-wheel and throwing the same against the platen; key-controlled means for first closing the electric circuit of said devices; and an electromagnetically-controlled device for freeing said devices from key-control to break said circuit independently of the return movement of the key.

23. An electric typewriter having a type-wheel; a platen; electromagnetically-actuated devices for rotating the type-wheel and throwing the same against the platen; key-controlled mechanism; make-and-break devices detachably connected with the latter for controlling the flow of exciting current in the circuit of said electromagnetically-controlled devices; and a device which breaks

the connection between said key-controlled mechanism and make-and-break devices before the completion of the printing stroke of the type-wheel and thereby interrupts said exciting current.

24. An electric typewriter having a key-controlled type-wheel; a platen; mechanism for throwing the type-wheel against the latter to print the character; an electromagnet which controls said mechanism; means for rotating the type-wheel; and a second electromagnet which controls said means and the circuit through the first-named electromagnet.

25. An electric typewriter comprising a type-wheel; a platen; devices for rotating the type-wheel; an electromagnet which actuates said devices; mechanism for throwing the type-wheel against the platen to print the character; a second electromagnet which actuates said mechanism; and a device for breaking the circuit through said electromagnets, said device being controlled by the second electromagnet.

26. An electric typewriter comprising a type-wheel; a platen; carriage-controlling means; devices for throwing the type-wheel against the platen to print the character; an electromagnet which controls said devices and means; mechanism for rotating the type-wheel; and a second electromagnet which actuates said rotating mechanism and controls the circuit of the first-named electromagnet independently of said rotating mechanism.

27. An electric typewriter comprising a type-wheel; a platen; ribbon-feed mechanism; devices for throwing the type-wheel against the platen to print the character; an electromagnet which actuates said devices and ribbon-feed mechanism; means for rotating the type-wheel; and a second electromagnet which controls said rotating means and the circuit through the first-named electromagnet.

28. An electric typewriter comprising a type-wheel; a platen; carriage-controlling means; ribbon-feed mechanism; devices for throwing the type-wheel against the platen to print the character; an electromagnet which controls said devices, means and ribbon-feed mechanism; means for rotating the type-wheel; and a second electromagnet which controls said rotating means and the circuit through the first-named electromagnet.

29. An electric typewriter comprising a type-wheel; a platen; mechanism for throwing the type-wheel against the platen to print the character; an electromagnet which controls said mechanism; devices for rotating the type-wheel; and a pair of electromagnets one of which is arranged to actuate said devices to rotate the type-wheel in one

direction and the other of which is arranged to actuate said devices to rotate the type-wheel in an opposite direction each of the last-named electromagnets being arranged to control the circuit through the first-named electromagnet independently of said type-wheel-rotating devices.

30. An electric typewriter comprising a type-wheel; means including a pair of locking pawls for holding the same in normal position; means for rotating the type-wheel; and a pair of electromagnets which actuate said means and said pawls and which are arranged to swing the latter out of locking position to permit the rotation of the type-wheel.

31. In an electric typewriter comprising keys, the combination with a rotary type-wheel and a platen; of key-controlled type-wheel-rotating electromagnets; a printing-controlling electromagnet; carriage-feed-controlling mechanism; and automatically-operating devices for interrupting the circuit through said electromagnets independently of the return movement of the key; said mechanism and devices being controlled by said printing-controlling electromagnet.

32. In an electric typewriter comprising keys, the combination with a rotary type-wheel, and an inking ribbon; of key-controlled type-wheel-rotating electromagnets; a printing-controlling electromagnet; and ribbon-feed-controlling mechanism controlled by the latter.

33. In an electric typewriter comprising keys, the combination with a rotary type-wheel and an inking ribbon; of key-controlled type-wheel-rotating electromagnets; a printing-controlling electromagnet; ribbon-feed-controlling mechanism; and automatically-operating devices for interrupting the circuit through said electromagnets independently of the return movement of the key; said mechanism and devices being controlled by said printing-controlling electromagnet.

34. In an electric typewriter comprising keys, the combination with a rotary type-wheel and a platen; of key-controlled type-wheel-rotating electromagnets; a printing-controlling electromagnet; make-and-break devices in the circuit of said electromagnets; carriage-feed-controlling mechanism; and automatically-operating devices for actuating said make-and-break devices to interrupt the circuit through said electromagnets independently of the return movement of the key; said mechanism and means being controlled by said printing-controlling electromagnet.

35. In an electric typewriter comprising keys, the combination with a rotary type-wheel and an inking ribbon; of key-controlled type-wheel-rotating electromagnets;

a printing-controlling electromagnet; ribbon-feed-controlling mechanism; and automatically-operating devices for actuating said make-and-break devices for interrupting the circuit through said electromagnets independently of the return movement of the key; said mechanism and means being controlled by said printing-controlling electromagnets.

36. In an electric typewriter comprising keys, the combination with a rotary type-wheel, a platen and an inking ribbon; of key-controlled type-wheel-rotating electromagnets; a printing-controlling electromagnet; make-and-break devices interposed in the circuits of said electromagnets; devices for transmitting the working movement of the keys to said make-and-break devices to close the circuit through said electromagnets; and automatically-operating devices for interrupting the circuit through said electromagnets independently of the return movement of the key; the last-named devices being controlled by said printing-controlling electromagnets.

37. In an electric typewriter comprising keys, the combination with a rotary type-wheel having a shaft provided with arms, a platen and an inking ribbon; of key-controlled type-wheel-rotating electromagnets; a printing-controlling electromagnet; make-and-break devices interposed in the circuit of said electromagnets; said devices being arranged to cooperate with said arms to limit the rotary motion of said type-wheel shaft.

38. In an electric typewriter comprising keys, the combination with a rotary type-wheel, a platen and an inking-ribbon; of key-controlled type-wheel-rotating electromagnets; a printing-controlling electromagnet; circuit-breaking devices interposed in the circuit of said electromagnets; connecting devices which connect said keys with said circuit-breaking devices; and automatically-operating devices for disconnecting the keys from said circuit-breaking devices to permit the interruption of the circuit independently of the return movement of the key.

39. In an electric typewriter comprising keys, the combination with a rotary type-wheel; of key-controlled type-wheel-rotating electromagnets; a make-and-break device interposed in the circuit of said electromagnets; and mechanism controlled by the latter for controlling said make-and-break device to interrupt the circuit of said electromagnets independently of the return movement of the key.

40. In an electric typewriter, the combination with a rotary type-wheel; of a printing-controlling electromagnet; a circuit-breaking device interposed in the circuit of said

printing-controlling magnet; and means controlled by the latter for controlling said circuit-breaking device to interrupt the circuit of said electromagnet independently of the return movement of the keys.

41. In an electric typewriter, the combination with a rotary type-wheel; of type-wheel-rotating electromagnets; links connecting the armatures of said electromagnets with each other; a pinion upon the type-wheel shaft; and a toothed segment meshing with said pinion and connected with said links.

42. In an electric typewriter the combination with a rotary type-wheel; of type-wheel-rotating electromagnets; a printing-controlling electromagnet; links connecting the armatures of said electromagnets with each other; a pinion upon the type-wheel shaft; a toothed segment in mesh with said pinion and connected with said links; and automatically-operating devices for interrupting the circuit through said electromagnets independently of the return movement of the keys.

43. In an electric typewriter the combina-

tion with a rotary type-wheel having a shaft formed with a lug; of type-wheel-rotating electromagnets; and pawls hinged to the armatures of said electromagnets; said lug being arranged to cooperate with the free ends of said pawls to position said type-wheel shaft.

44. In an electric typewriter the combination with a rotary type-wheel having a shaft formed with a lug; of type-wheel-rotating electromagnets the armatures of which are connected with each other; a pinion mounted upon said shaft; a toothed-segment which meshes with said pinion and is connected with the armatures of said electromagnets; and pawls hinged to said armatures; said lug being arranged to cooperate with the free ends of said pawls to position said type-wheel shaft.

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

OSKAR FISCHER.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.