

No. 757,319.

PATENTED APR. 12, 1904.

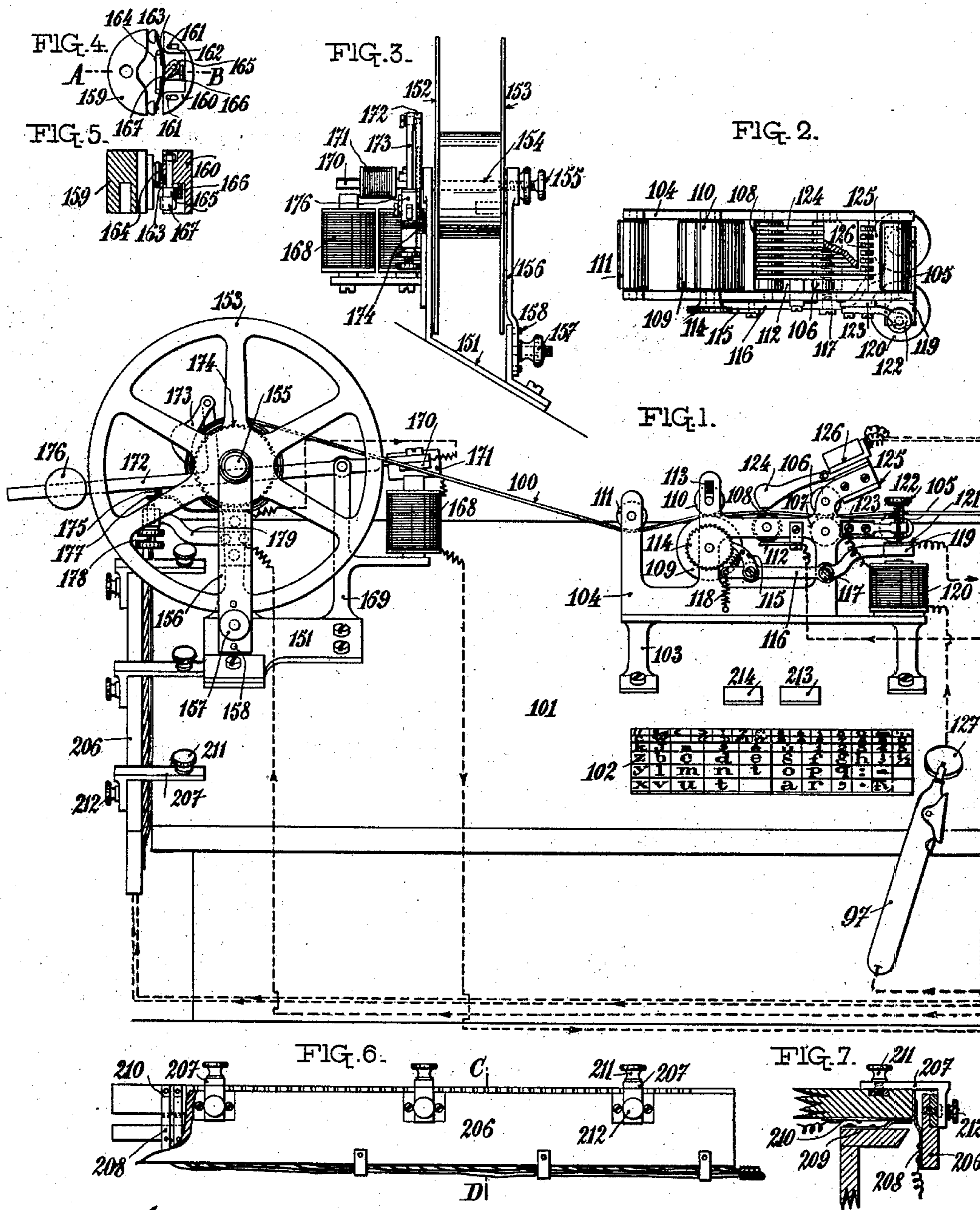
J. LAGARDE.

TYPE SETTING OR COMPOSING MACHINE.

APPLICATION FILED OCT. 29, 1902.

NO MODEL.

5 SHEETS—SHEET 1.



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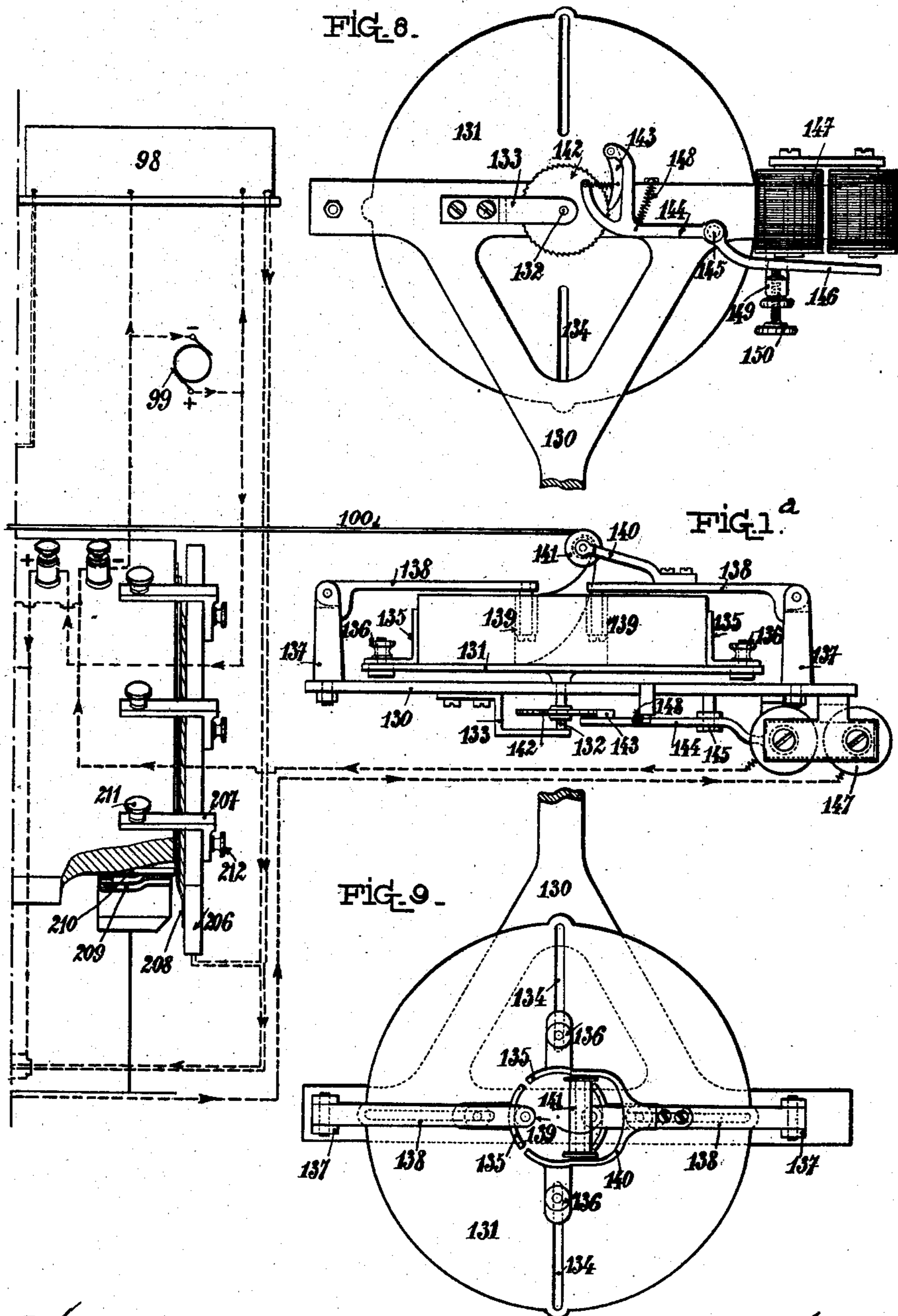
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5 SHEETS—SHEET 2.



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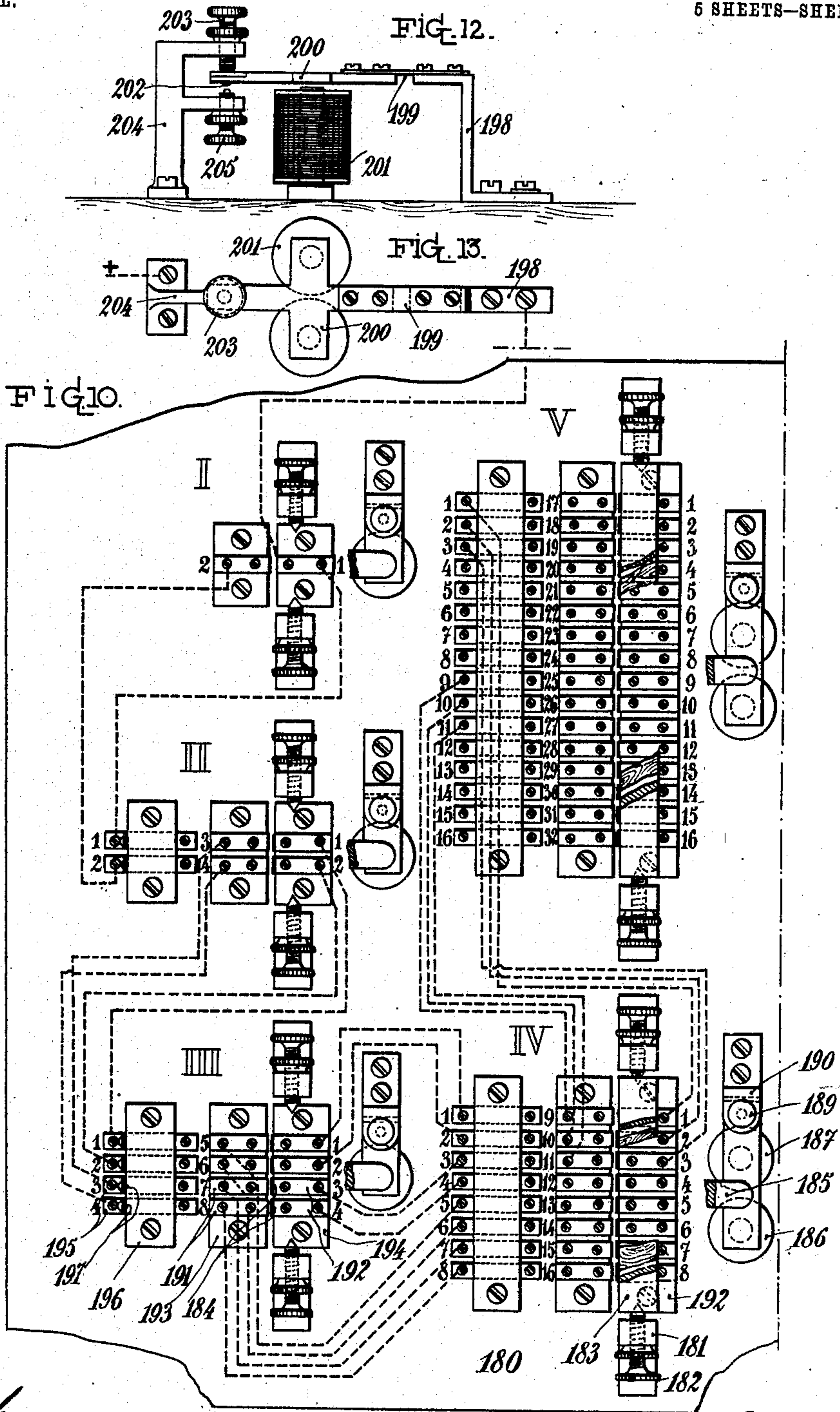
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5 SHEETS—SHEET 3.



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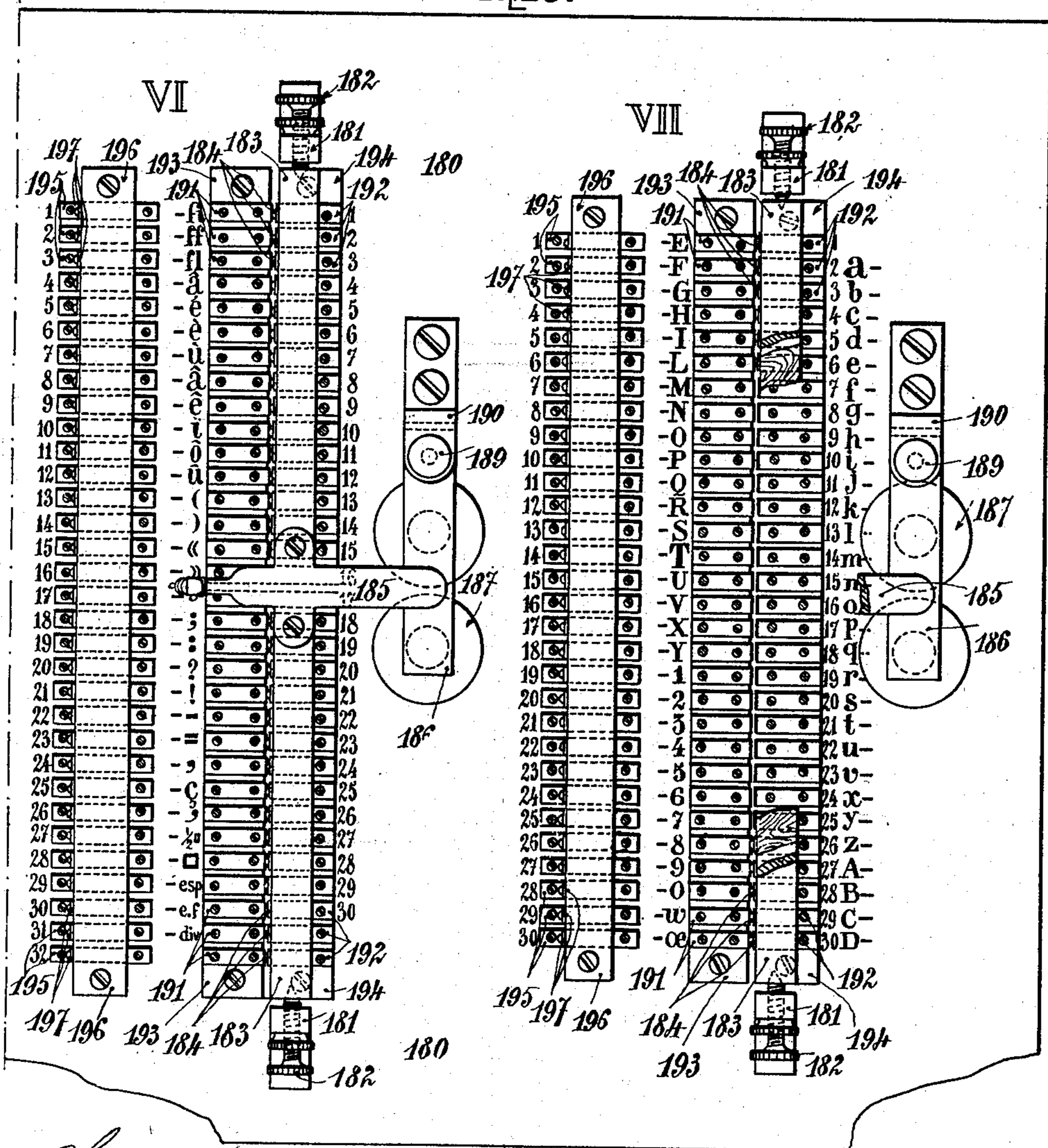
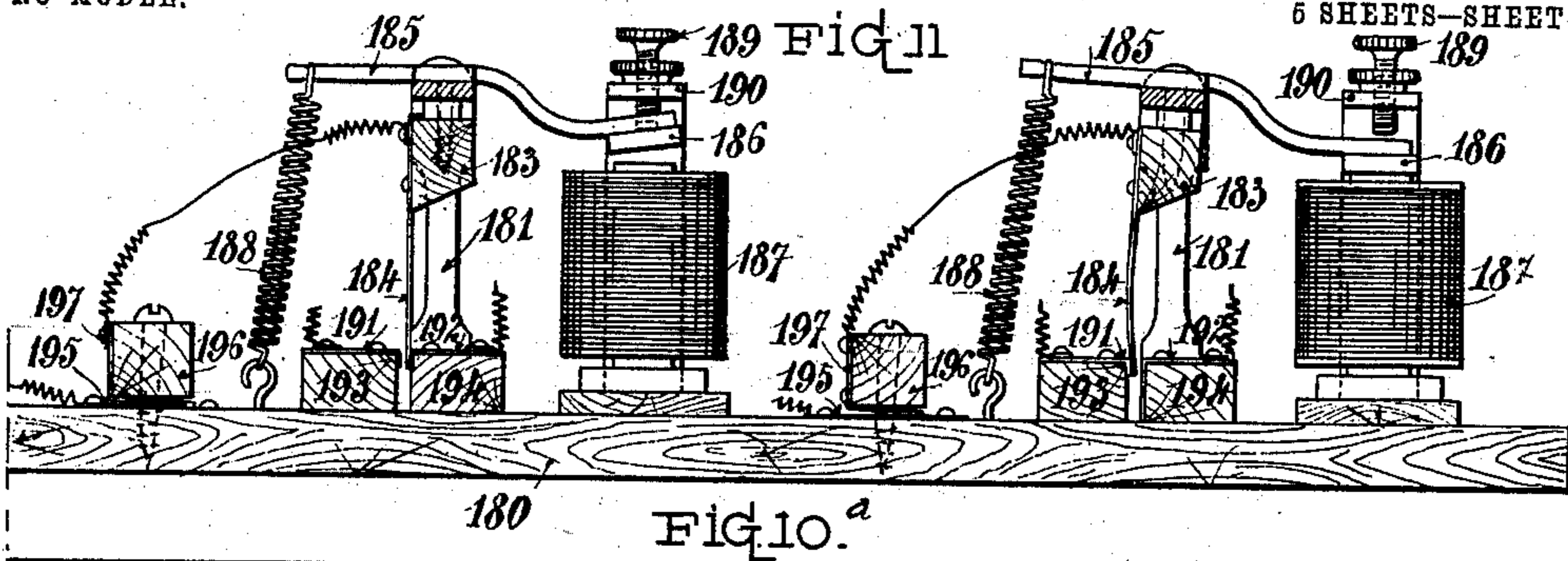
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6 SHEETS—SHEET 4.



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No. 757,319.

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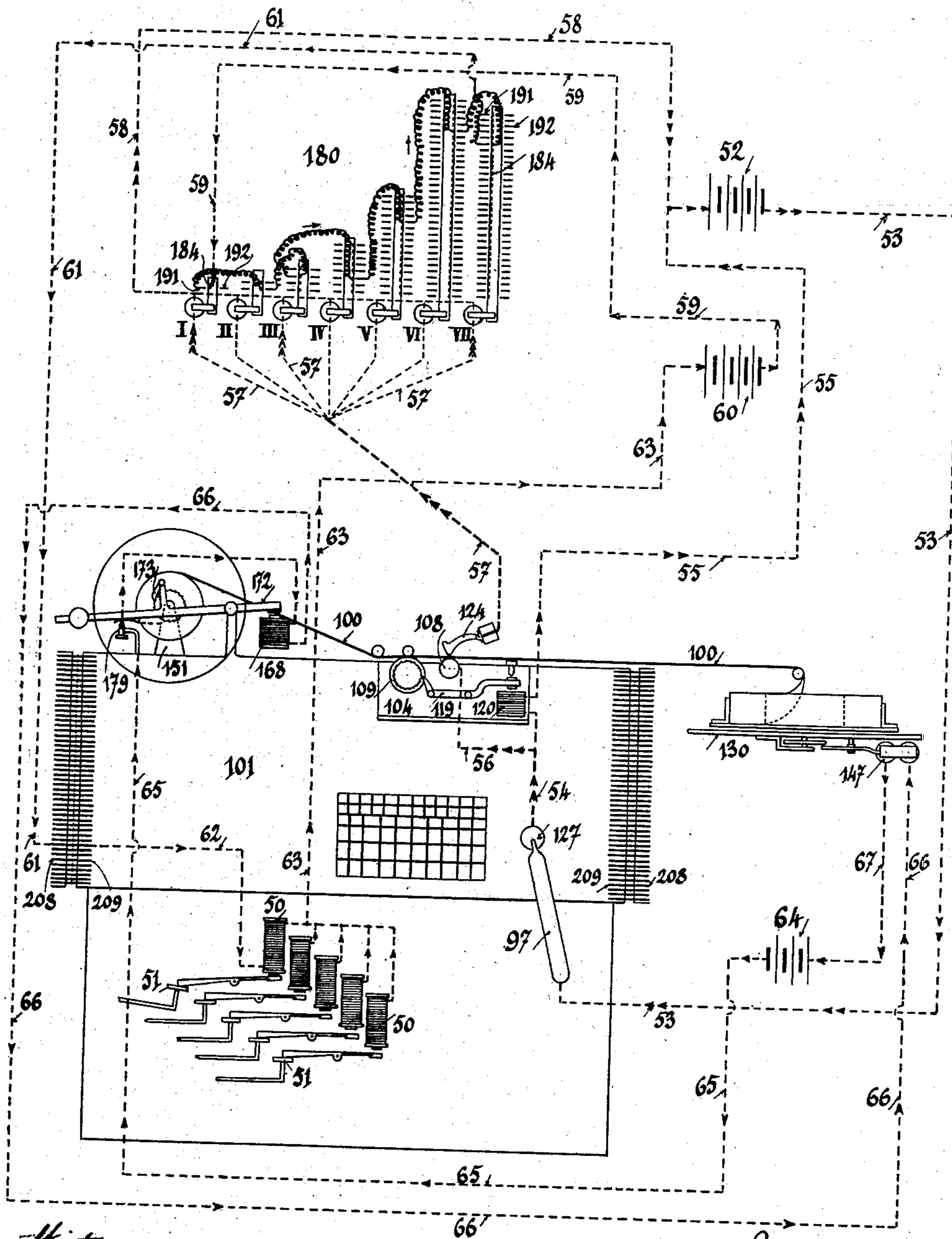
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NO MODEL.

6 SHEETS—SHEET 5.

FIG. 14.



Witnesses:

18. K. Bmclā

W. H. Thompson

Erventor

By *Jules Lagarde*
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UNITED STATES PATENT OFFICE.

JULES LAGARDE, OF CLERMONT-FERRAND, FRANCE.

TYPE SETTING OR COMPOSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 757,319, dated April 12, 1904.

Application filed October 29, 1902. Serial No. 129,231. (No model.)

To all whom it may concern:

Be it known that I, JULES LAGARDE, a citizen of the French Republic, residing at Clermont-Ferrand, France, have invented certain new and useful Improvements in or Relating to Type Setting or Composing Machines, of which the following is a specification.

The present invention relates to type setting or composing machines, and particularly to an electric controlling mechanism for automatically controlling the type-setting in such machines with the aid of record bands or strips on which the text to be composed is previously applied in the form of perforations in columns or series corresponding to the various characters or signs. The corresponding character is preferably printed below each column or series of perforations, the characters thus constituting the text to be composed. The record-band can be produced in any suitable manner and particularly by the machine or mechanism which forms the subject of a separate patent application made by me on the 27th day of July, 1901, Serial No. 69,951. Moreover, the mechanism constituting the machine of the present invention has been constructed as a result of a study of the mechanisms of said machine and the electric contact system which forms the subject of my previous patent application, Serial No. 69,950, filed July 27, 1901.

The present invention is intended to assist the operator, who in the usual way operates the keyboard of the composing-machine, by the automatic control of the keyboard and, as it has been previously stated, with the aid of a record-strip provided with the characters and signs of the text to be composed in the form of perforations, which in passing through the present machine, as hereinafter described, are adapted to produce electric contacts and corresponding currents which respectively operate the type setting and composing mechanism. Each character or typographic sign corresponds to a particular combination of these electric contacts, this combination being such that the resulting currents act upon commutators of a special combination through which they are transformed to a single current and directed according to the combination to the electromagnet corresponding to

the selected sign or character of the setting-machine corresponding to the respective column of perforations of the record-band.

The particular feature of the mechanism with which the record-band coöperates is called the "reader" and is preferably arranged upon the electric contact mechanism under the control of the operator, so that the latter not only overlooks comfortably and easily the mechanical operation, but also the text of the composition, so that he can effect corrections by stopping the machine in case mistakes have occurred in the previous transcription in the writing-machine above mentioned. In short, the operator can combine his mental ability with the mechanical and rapid operation of the automatic mechanism.

In the accompanying drawings a construction of machine according to this invention is given by way of illustration.

Figure 1 shows the whole arrangement of the mechanism in connection with the electric contact-board, as described in application Serial No. 69,950, of 1901, and the automatic reader and winder for the perforated and printed control or record strip supported by a band-carrier to the right of the electric contact device. These parts are electrically connected with one another and with a multiplying apparatus. Fig. 1^a is an elevation of the band-carrier. Fig. 2 is a plan view of the automatic reader. Fig. 3 is a side view of the winder. Fig. 4 shows in detail one of the drums or hubs for the transport of the perforated band from one spool to the other. Fig. 5 is a horizontal section on the line A B of Fig. 4. Fig. 6 shows the upper portion of the lateral sides of the contact-board through which the electric connections with the multiplying apparatus are effected. Fig. 7 is a cross-section on the line C D of Fig. 6. Fig. 8 is an under side view of the record-band carrier as shown at the right of Fig. 1. Fig. 9 is a top plan view of the same band-carrier. Fig. 10 is a plan view of a portion of the various contacts of the multiplying apparatus. Fig. 10^a is a plan view of other contacts of the multiplying apparatus. Fig. 11 is a side elevation, partly in section, of a portion of the contacts seen in Figs. 10 and 10^a. Fig. 12 is a side view of

a device connected with the multiplier and adapted to cause the interrupting spark to be produced always at one point. Fig. 13 is a plan view of this device. Fig. 14 is a diagram showing the circuit connections of a complete apparatus.

The record-strip, which is perforated and printed by any suitable machine, passes into an automatic reading apparatus. This automatic reading apparatus (shown in Figs. 1 and 2) is secured upon a base 101 of the electric contact device above the character-board 102 under the control of the operator, so as to enable the latter to strike at a convenient moment with his stylus 97 one or the other of the blocks of the board 102 in order to act independently from the automatic operation of the mechanism upon the keyboard of the composing-machine, so as to correct any mistakes which may occur in the perforated band. This reading apparatus consists of a frame 104, secured by a support 103 upon the platform 101, between the flanges of which are arranged rollers 105, 106, 107, 108, 109, 110, and 111, which serve as a guide to the perforated record-strip 100. The cylinder 108 is of insulating material and is surrounded by a conductive sleeve which forms part of the circuit of an electric generator 99 through a spring 112, fixed upon an insulating-support of the frame 104 and bearing against the periphery of the cylinder 108. The roller 109 is covered with yielding material and insures through the pressure of the bearing-springs 113 of its corresponding roller 110 the passage of the band 100 through the machine. The roller 109 for moving the band 100 is driven by a ratchet 114, fixed on the shaft of the roller 109 and actuated by a pawl 115, resiliently mounted upon a lever 116, pivoted at 117 on the frame 104 and normally drawn down by a spring 118. At the opposite end the lever 116 forms an armature 119, which coöperates with the core of a double electromagnet 120. A flat spring 121, fixed on the armature 119, acts in combination with a set-screw 122 as an ordinary trembler under the magnetic action of the electromagnet 120. The current flowing from the generator 99 to the stylus 97 passes through the block 127 to the electromagnet 120 and from the latter to the insulated support 123 of the screw 122 and returns through the trembler 121 to the generator. It is evident that the current could flow in the opposite direction. The band 100 thus drawn from right to left on passing over the roller 108 passes under and in contact with a series of contact-fingers 124, in this case seven in number, secured independently of each other upon a cross-bar 125, of insulating material, fixed to the frame 104. These fingers, which could be replaced by conductive spring-contacts, are connected separately by corresponding contacts 126 to the multiplier mechanism, which

will be hereinafter described and is particularly represented in Figs. 10 to 13. The ends of the fingers 124 which rest above the cylinder 128 are brought in contact with the jacket of this cylinder when the perforations in the band 100 present themselves beneath the ends of the fingers 124.

The working and the resting of the reading apparatus above described is effected by placing the stylus 97 in or out of contact with a special contact-stud 127, electrically connected with the electromagnet 120. The record-strip 100 is on leaving said reading-machine wound onto a winding-spool similar to that shown at the left of Fig. 1 and as hereinafter described. The beginning of the text of the band being in the center of the wound-up band, it is necessary for the reading operation, which should begin with the beginning end of the band, that the latter should be drawn out from the center of the coil. To this end the band 100, after its having been wound on the drum on the record-making machine and after the operator has made several windings of blank band in order to avoid tearing of the printed portions, is disengaged from the drum and placed on a band-carrier specially adapted for this purpose and shown in Figs. 1^a, 8, and 9. This carrier consists of a horizontal triangular support 130 and is secured to the main frame of the composing-machine by an extension or by a bracket. Upon this support 130 is mounted a disk 131, the shaft 132 of which extends through the support 130 and turns at its lower end in a bracket 133, secured to the support 130. This disk 131 is provided with four radial grooves 134, in each of which slides an angle-bar 135, which can be secured at any convenient point by a screw 136. The vertical parts of the bars 135 are of a sufficient height to serve as a support for the roll and are preferably of semicircular or arc-shaped form. At each end of the support 130 is a standard 137, to each of which is fixed with a limited motion a horizontal lever 138, carrying a roller 139, which is arranged above the disk 131 toward the center of the latter. One of the levers 138 carries, moreover, a fork 140, in which turns a horizontal roller 141.

In order to place the perforated record-band on the carrier, the levers 138 are raised and the roll is placed upon the disk 131 by inserting it between the plates 135. The levers 138 are then turned down and their rollers enter the space previously occupied by the hub of the winder. The band is then drawn out by the end in the center of the roll and guided over the roller 141, which directs it horizontally toward the automatic reading device. The diameter of the internal opening of the roll on the band-carrier grows as the band is unwound in the same proportions as the diameter of the roll, which is formed on the winding-drum, so that the rotation of

the latter and of the band-carrier can be synchronously controlled, as will hereinafter be explained.

The rotation of the disk 131 is effected by a ratchet 142 on the shaft 132 of the disk and driven by a spring-pawl 143, mounted on a lever 144, which is pivoted at 145 to the support 130. This lever 144 forms with its extremity opposite to the pawl 143 an armature 146, which coöperates with the cores of a double electromagnet 147, suspended from the support 130. A spring 148 draws the lever 144 after each attraction of the electromagnet 147 back to its initial position. A post 149, fixed to the support 130, carries an adjusting-screw 150, which allows of lengthening or shortening the throw of the pawl 143 to cause it to move back over a larger or smaller number of teeth, whereby the speed of unwinding of the band is regulated.

The band 100 is upon leaving the automatic reader wound on a bobbin. (Shown in Fig. 1 to the left of the reader and in side view in Fig. 3 of the drawings.) This winding-drum is supported by a frame 151, the base of which has the same inclination as that of the platform 101 of the electric contact device. The drum consists of two disks 152 and 153, turning about an axle 154, one end of which rotates on the centering-point of an adjusting-screw 155, arranged in an adjustable bracket 156, which is fixed to the frame 151 by a screw 157, pins 158 maintaining the bracket 156 in its position precisely adjusted with regard to the other bracket fixed to the frame 151. The center of the drum, between the two disks 152 and 153, is formed by an expansible hub on which the band is wound from the reader. This hub is constituted by two halves 159 160, which when connected form a cylinder the diameter of which can when required, be reduced, so as to allow of an easy removal of the band. One of the parts, 159, is fixed on the disk 152, while the other part, 160, is movable to and from the other and is attached to the disk by pins 161, which engage in grooves or slots 162 and guide the part 160 in its movement.

A spring or trap 163, bearing with its ends against the part 159 and with its center against the part 160, tends to maintain the two halves apart from one another, so as to form with their external circumferences a cylinder of the maximum dimensions, the outward movement of the half 160 being limited by the pins 161 in the slots 162. The compression of the springs 163 in order to allow the two halves to approach each other is effected by a fork 164, the prongs of which press against the springs 163. This fork is operated by a cam 165, acting against its raised edge 166. The shaft of the cam 165 serves as a guide for the fork 164 and is provided with a handle which allows of its operation. By acting through the cam 165 upon the spring 163 in order to allow the approach of the two parts 159 160

the center of the rolled-up band is at the same time loosened, so that the roll can then be removed. The winding of the band onto the drum is effected by the action of a double electromagnet 168, mounted on a bracket 169 on the frame 151, and an armature 170, on which is mounted a small electromagnet 171. This armature is attached to the extremity of a lever 172, which is pivoted on the bracket 169 and carries toward its other end a pawl 173, engaging with a ratchet-wheel 174 on the axle 154 of the disks 152 153. A lug 175 on the lever 172 bears under the action of a counterweight 176, mounted at the end of the lever 172, against a flexible blade 177, fixed to an insulating part carried by the frame 151. On yielding this blade 177 makes contact with the central point of an adjusting-screw 178, which is carried by a bracket 179, fixed to the frame 151. The current coming from the generator 99 flows to the bracket 179 and screw 178 and passes through the blade 177 when the latter is in contact with the screw 178, thence through the armature-coil 171 and magnet 168, after which it passes through the double electromagnet 147 of the band-carrier and from here to the generator. The respective coils 168 and 147 of the winder and of the band-carrier are thus switched in one circuit, and their motions therefore take place in a synchronous manner. When the lever 172 by the action of its counterweight 176 causes the blade 177 to make contact with the screw 178, the circuit is closed, and the coils 168 and 147 are energized, so as to attract the respective armature-levers 144 and 172, and consequently effect the rotation of the disk 131 of the band-carrier and of the disks 152 and 153 of the winding-up drum. In oscillating, the lever 172 leaves the blade 177, which in its turn is separated from the screw 178 and breaks the circuit. The current thus no longer passing through the coils allows the levers 142 and 172 to oscillate in the reverse direction, and the lever 172 comes in contact under the influence of its weight 176 with the blade 177 in order to close the circuit, and consequently to produce another operation simultaneously with the rotations of the disks of the band-carrier and the winding. The band thus transported from the band-carrier to the drum on passing over the reader never travels a longer distance than that allowed by the release of the cylinders of the reader, and consequently the drum will only wind up a length of the band determined by the trembler 121 of the reader, when the counterweight of the armature-lever of the drum allows the current to act upon the driving device of this drum and of the band-carrier. The synchronism thus established releases the operator from attending to the winding and unwinding of the band. The various actions of the combined contacts of the fingers 124 at the moment of the displacement of the band are transmitted to a special multiplying device 98,

Fig. 1, the function of which consists in distributing between the various contacts of the electric controlling apparatus the current which causes the function of each of the keys when the corresponding electromagnet is brought automatically into the circuit of the current of the generator by the series of perforations of the band. This multiplying apparatus is shown in Figs. 10, 11, 12, and 13 and comprises a series of commutators, in this case seven in number, and each comprising a variable number of contacts. In order to simplify the explanation which follows, these commutators are designated with the numbers I to VII, as shown in Fig. 10. Each commutator consists of two standards 181, mounted upon a base-plate 180, which serves as the base for the whole of this apparatus. At their upper parts these standards 181 carry adjusting-screws 182, between the points of which a wooden bar 183 is mounted, to which are screwed plates or blades 184, the number of which varies for each commutator according to the combinations required. Transversely to and at the center of the bar 183 is a lever 185, one end of which carries an armature 186, which coöperates with an electromagnet 187. The other end of the lever 185 is connected to a spring 188, which tends to press the armature 186 against a set-screw 189, screwed into a support 190. The lower ends of the blades 184 lie between two series of other plates 191 192, which are arranged, respectively, for each series in equal number to the blades 184 upon bars 193 and 194, secured to the base 180. When no current passes through the electromagnet 187, the lever 185, acted upon by the spring 188, tends to maintain all the blades 184 pressed against the plates 192 on the right of the commutator.

The electric connection between the commutators is effected through contacts or terminals 195, arranged upon the base 180 of the apparatus in numbers equal to those of the contact-blades 184 of each commutator. Above the contacts 195 is arranged a bar 196, carrying other corresponding contacts 197, which are bent so as to produce a resilient action in order to insure the connection. A flexible wire connects each contact 197 with the corresponding blade 184 on the movable or oscillatory part of the commutator. The electric connection of the other contacts of the commutator is effected in the manner indicated, for instance, for some of them in the drawings. This connection will be easily understood if it is noted that the wires are successively connected from one commutator to the other through their respective ends with the plates above which are indicated the corresponding reference-numbers. The characters, numerals, or signs situated near the plates of the commutators VI and VII indicate the points from which the particular current flows to each of the said characters, nu-

merals, or signs, the direction of which is given by the action of the commutators. The various oscillations or combined motions of the commutators are effected by the series of perforations of the band, which cause them to be brought into the circuit by certain of the fingers 124 of the current from the generator. The feed-wire of this current is connected to a circuit-breaker adapted to cause the break-spark to be made always at the same point in order to avoid the destructive effects upon the contact-plates of the commutators. This break device (represented in Figs. 12 and 13) consists of a bracket 198, to which is connected by a spring 199 an armature 200, coöperating with a double-acting electromagnet 201. This armature 200 bears under the action of the spring 199, against an adjustable screw 203, fixed to another bracket 204. Another adjustable screw 205 is situated opposite to the screw 203 on a bracket or arm 204 and faces the contacts 202 of the armature. The screw 205 is connected through the bracket 204 to the wire which supplies the current from the generator. This current passes through the screw 205 to the armature 200 and to the support 198, from which it passes to the blade 184 of the commutator I, from whence it takes a course, as indicated, through the various commutators controlled by the reader. The current which passes through the electric contacts of the seven commutators is connected by a common wire to the electromagnet 201 in such a manner that each time when one or more commutators are in action the current influences the said electromagnet and attracts the armature 200.

The contact-blades 164 of the commutators are very flexible, so that each time an attraction of the lever 185 takes place the blades 184 will bend at their centers, (commutator VII, Fig. 11,) so that when the current of the commutators is broken and the spring 188 returns the lever 185 to its former position the blades 184 remain with their ends for a moment in contact with the corresponding contacts 191. Though this contact of the blades 184 and 191 will be of very short duration, this period of contact nevertheless extends beyond that which is necessary for breaking the current between the two contact-points formed by screw 205 and the armature 200, and thereby protects the parts against spark destruction. The extent of movement or position of the armature 200 is regulated at will by the screws 203 and 205.

The various contact-plates 191 192 of the commutators VI and VII, Fig. 10, in front of which are indicated their typographic characters or signs, are connected to the terminals of the electric keyboard by insulating-bars 206, Fig. 1, fixed by brackets 207 to the lateral walls of the frame 101. These bars 206 carry on their inner sides as many blades 208 as there are electric terminals on the board. The

wires of these contacts make contact with the blades 209, against which bear other blades 210, which are in connection with the blocks of the contact-board 102.

5 The brackets 207 are secured to the base of the board by screws 211, which effect, by being tightened or loosened and by the separation of the bars from the board, the connection or disconnection between the multiplier and the contact device. Other screws 212 allow of the longitudinal displacement of the bars 206 with regard to the base 101, so as to position the contacts 208 and 210 relatively to one another.

15 The strip on being unwound allows, with the aid of the reading device and by means of the contact-fingers 124, corresponding to the perforations in the strip, as above described, of the passage of the current to the corresponding contacts of the multiplier, in which through the contact-plates 191 and 192 the current for the contacts of the electric board receives its final direction. If thus, for instance, the perforations of the band are combined for the production of the character "T" and the action of the reading device causes the commutators I, III, IV, and VII to oscillate, the current entering by the contact-blade 184 of the commutator I passes from this contact to the contact-plate 191, with which the blade 184 has been brought in contact by the attraction of the corresponding electromagnet 187. From here the current flows without reversal through the conductor 2 to the commutator II and leaves the latter through the contact 192, enters the commutator III, from which it passes by inversion to 6 and by a second inversion travels to 14 of the commutator IV and to this number in the commutators V and 40 VI, which are inoperative, and by inversion to the commutator VII, which it leaves through the corresponding contact-plate 191, which bears the indication "T." This action will be the same for all perforations which travel 45 through the reader and which, according to their combination, act independently of one another upon the commutators, so as to direct the current toward the acting magnet of the electric device corresponding to the characters 50 which are represented by these perforations.

It will now be easily understood that with the apparatus above described the operator need only watch the unwinding of the perforated record-strip in the reader and constantly 55 press the stylus 97 upon the button 127, so as to allow, with the aid of the current from the generator 99, the various actions of the parts of this mechanism to take place and their combined action upon the electromagnets, which 60 can be arranged above the keyboard of a type-composing machine or brought in direct connection with the levers operated by the keys.

If a mistake occurs through the wrong character being given on the perforated strip, the 65 operator need only raise the contact-fingers

124 in any convenient manner—for instance, by a single armature attracting the whole set of fingers—and touch with his stylus the correct block on the contact-board. Upon returning the stylus 97 to the block 127 the drawing-drum will move forward the band to the necessary extent so as to leave out the incorrect perforation, after which the contact-fingers on being lowered again allow the reader to continue its mechanical operation. 70 75

Insulated blocks 213 214 are arranged on the base 101 of the board in order to enable the operator by touching one or other of these blocks with his stylus to operate or to stop or start the mechanism of the type-composing machine at will. 80

When desired, instead of all the circuits of the complete apparatus being connected to a single generator, as above described, independent batteries may be employed, and such 85 an arrangement is shown diagrammatically in Fig. 14. In this arrangement the electric contact-board 101 supports the reader 104, through which passes the paper band 100 from the unwinding-roller 130 to the winding-up roller 151 and which the operator operates by means of a style 97 to actuate the keyboard of a type-setting machine. The contacts of this contact-board are connected by connections, hereinafter explained, to the 95 multiplier 180, the object of which is to guide by inversions the combinations of electric impulses toward one of the outlet-blades 191 or 192 of the said multiplier, said blades being respectively connected by contact-blades 208 209 to the various electromagnets 50, arranged each opposite one of the keys 51 of the keyboard of the type-setting machine. The connections between the various parts are as follows: The style 97, 105 held by the operator, is arranged in the circuit of a battery 52, from which it receives current by means of a wire 53, so that when this style constantly rests on the key 127 the current passes through the wire 54 and actuates the electromagnet 120 of the reader 104 and from thence returns through wire 55 to the battery 52. The trembler 119 of the reader, thus actuated by the electromagnet 120, acts in a continuous manner on the roller 115 109 in order to effect the supplying of the perforated band. The positive pole of the battery 52 is also connected by a shunt-wire 56 from the wire 54 to the metal cylinder 108, against which rest the seven brushes 124, 120 which come, respectively, opposite to the seven series of holes which in the example illustrated constitute the various combinations of the perforated band. Each of the brushes 124 is connected by a wire 57 to one of the 125 commutators I, II, III, IV, V, VI, and VII of the multiplier 180, and the return-wires of these commutators are connected by a single conductor 58 to the battery. By being placed in contact with the blades 191 or 192 130

the blades of the commutators direct the current of the battery 60 by a wire 59, connected to a commutator I, (according to the inversions effected and corresponding to the combination of the perforations of the band that may come under the contact-brushes 124 of the reader,) toward one or the other end blades 191 or 192. These blades 191 and 192 of the multiplier are respectively connected by wires 61 to blades 208 of the contact-board, which are in their turn in contact with the blades 209, coupled by wires 62 to the electromagnets 50, which act on the keyboard of the setting-machine, and from these the circuits are completed through a single conduit 63 to the battery 60.

The circuits of the unrolling and the re-winding mechanism for the perforated band 100 are as follows: A battery 64 is connected by a wire 65 to the contact 179 of the winding-up drum, and the contact is connected to the electromagnet 168 intermittently by the pivoted lever 172, said lever being operated by the magnet 168 in one direction and in the opposite direction by a counterweight and during its movement acting, by means of a pawl 173, on the said drum. From the electromagnet 168 the circuit passes by wire 66 through the magnet 147 of the unwinding-drum (which is thus started simultaneously with the winding-up drum) and from thence by wire 67 to the battery 64.

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

1. Electrical controlling mechanism for type setting and composing machines comprising a "reader" operated by a perforated strip to transmit current impulses, and a multiplier for distributing such impulses, said devices being combined and operated so that as the perforated tape passes through the "reader" current impulses are transmitted to the multiplier in an order and combination determined by the nature of the perforations in the tape and such multiplier directs current impulses according to the order and combination determined by the reader to circuits operating the keys of a type setting or composing machine.

2. Electrical controlling mechanism for type setting and composing machines comprising a "reader" operated by a perforated strip to transmit current impulses, a multiplier for distributing such impulses and a distributing and controlling contact-board operated in combination so that as the perforated tape passes through the reader, current impulses are normally transmitted to the multiplier in an order and combination determined by the nature of the perforations in the tape and such multiplier directs current impulses according to the order and combination determined by the reader to contact on the distributing and controlling contact-board and through these to electromagnets operating

the keys of a type setting or composing machine, but wherein the circuits through the reader and multiplier may be broken and coupled through the contact-board directly to any desired circuit operating the keys of the type setting or composing machine to facilitate the correction of errors.

3. In electrical controlling mechanism for type setting and composing machines wherein a reader operated by a perforated strip transmits current impulses to a multiplier and such multiplier directs current impulses, according to the order and combination determined by the reader, to circuits operating the keys of type setting or composing machines, a reader wherein a perforated tape is fed, a feed-drum for the tape, a ratchet-wheel coupled to such drum, a pawl, a trembler carrying such pawl and an electromagnet and contact for the trembler, both of which are in the transmitting-circuit, a metal cylinder included in the transmitting-circuit and over which the strip is fed, and a series of contact-fingers, also contained in the transmitting-circuit but insulated one from the other, and coupled independently to the different parts of the multiplier.

4. In electrical controlling mechanism for type setting and composing machines wherein a reader operated by a perforated strip transmits current impulses to a multiplier and such multiplier directs current impulses according to the order and combination determined by the reader, to circuits operating the keys of type setting or composing machines, unwinding and rewinding mechanism for the perforated strip wherein the strip is unwound from the center of the unwinding-spool and rewound upon a drum, comprising a carriage and drum respectively, a ratchet-wheel and a pawl gearing therewith for operating the carriage and drum, tremblers, and the electromagnets and contacts for said tremblers, said electromagnets and contacts being arranged in a common circuit so that the operation of the one synchronizes with that of the other.

5. In electrical controlling mechanism for type setting and composing machines wherein a reader operated by a perforated tape transmits current impulses to a multiplier and such multiplier directs current impulses, according to the order and combination determined by the reader to circuits operating the keys of type setting or composing machines, a multiplier composed of a series of commutators each having an oscillating arm, an electromagnet for operating each arm, each electromagnet being controlled by one of the contact-fingers of the reader, and in which the contact on the oscillating arm of the first of the series of commutators is connected to a generator and making contact with one of two fixed contacts coupled with contacts on the oscillating arm of the second commutator of the series which contacts make contact with one of two sets of contacts coupled to contacts on the oscillating

arm of the third commutator of the series and so on in multiple, and the fixed contacts of the last commutator of the series are coupled to the circuits operating the keys of the type setting or composing machine.

5 6. An automatic electric controlling device for type composing or setting machines comprising a perforated record-strip unwinding and winding mechanism a record "reading"
10 device with a series of contact-arms adapted to rest upon the record-strip and in electrical connection with a corresponding series of commutators electrically connected with the keys
15 of the type composing or setting machine substantially as described.

7. In electrical controlling mechanism for type setting and composing machines, record-strip-unwinding mechanism consisting of a revoluble carriage having adjustable supports for supporting a spool of record-strip, means 20 for revolving such carriage and a guide for conducting the record-strip from the center of the spool as said strip is unwound.

In testimony whereof I have signed my name to this specification in the presence of two sub- 25 scribing witnesses.

JULES LAGARDE.

Witnesses:

LOUIS SULLIGER,
EDWARD P. MACLEAN.