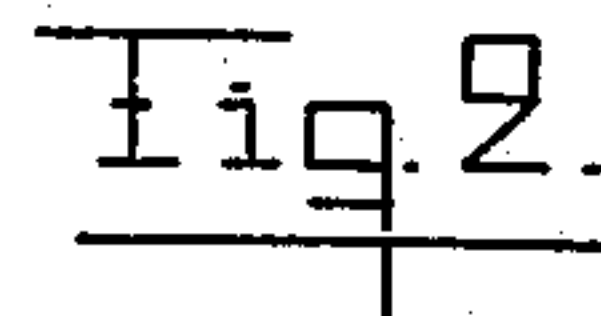
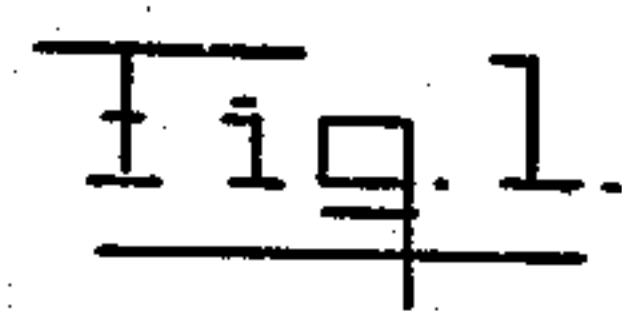


915,748.

4 SHEETS--SHEET 1.



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MEANS FOR ELECTRICALLY OPERATING TYPE SETTING MACHINES.

APPLICATION FILED JUNE 11, 1907.

915,748.

Patented Mar. 23, 1909.

4 SHEETS—SHEET 2.

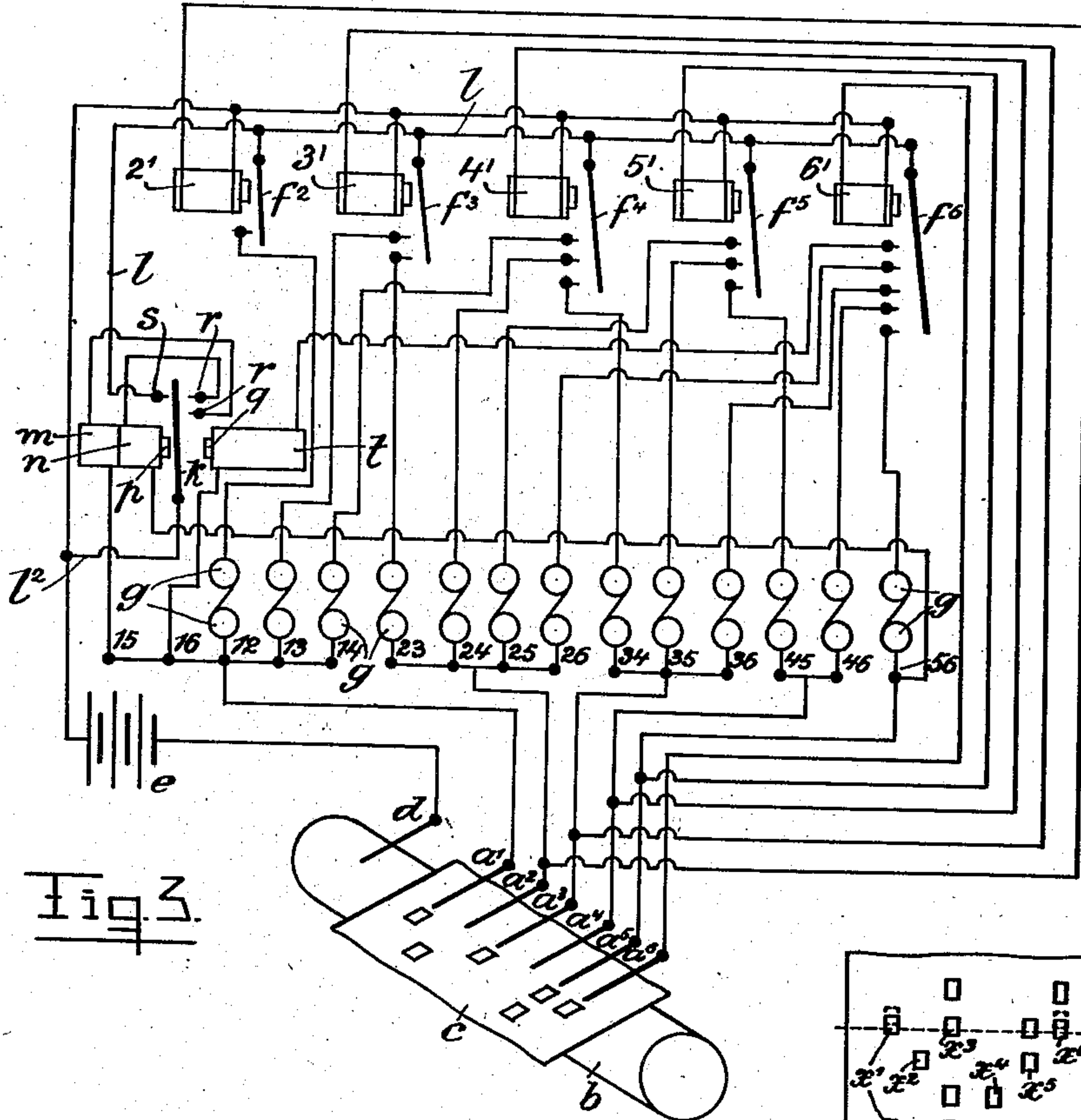


Fig. 3.

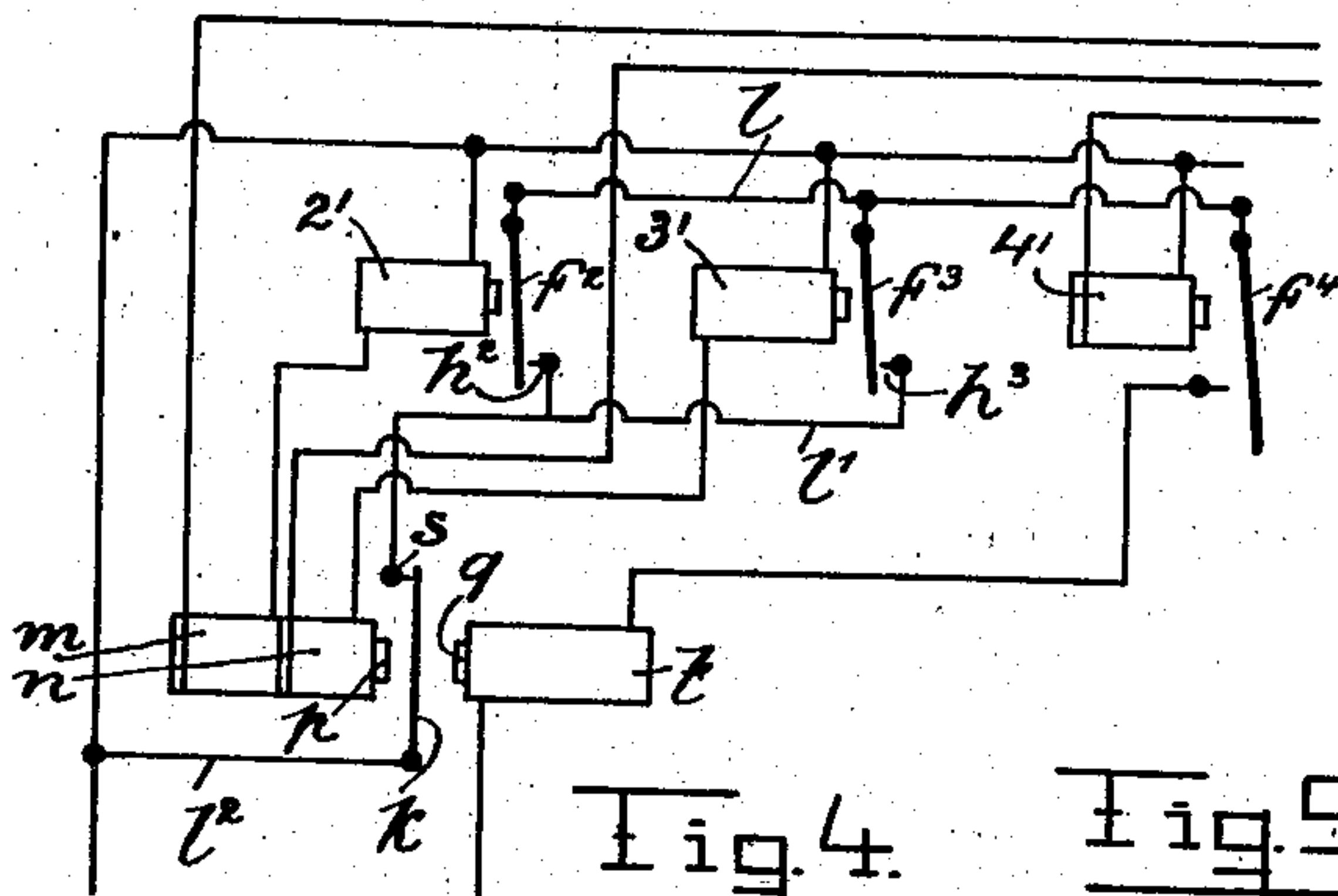


Fig. 4.

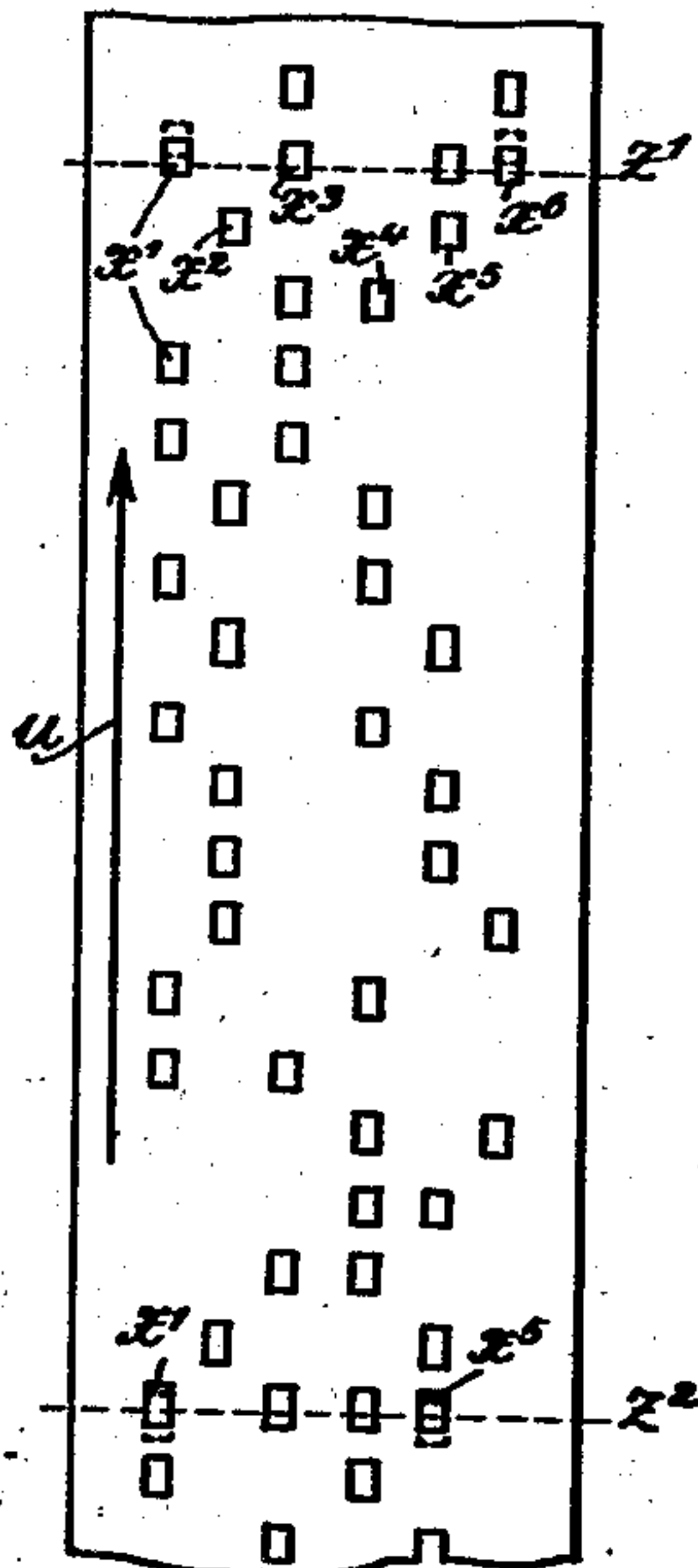


Fig. 5.

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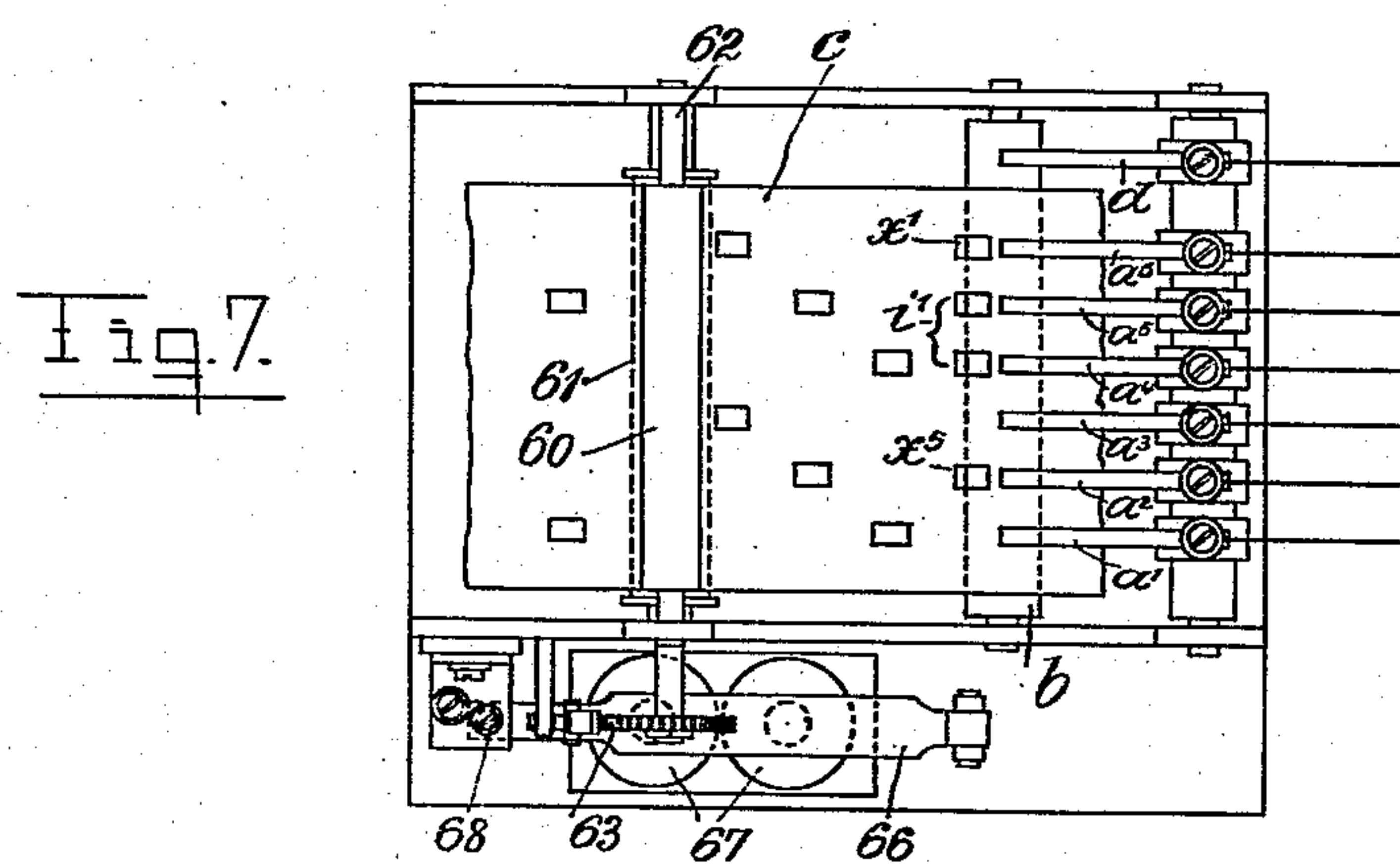
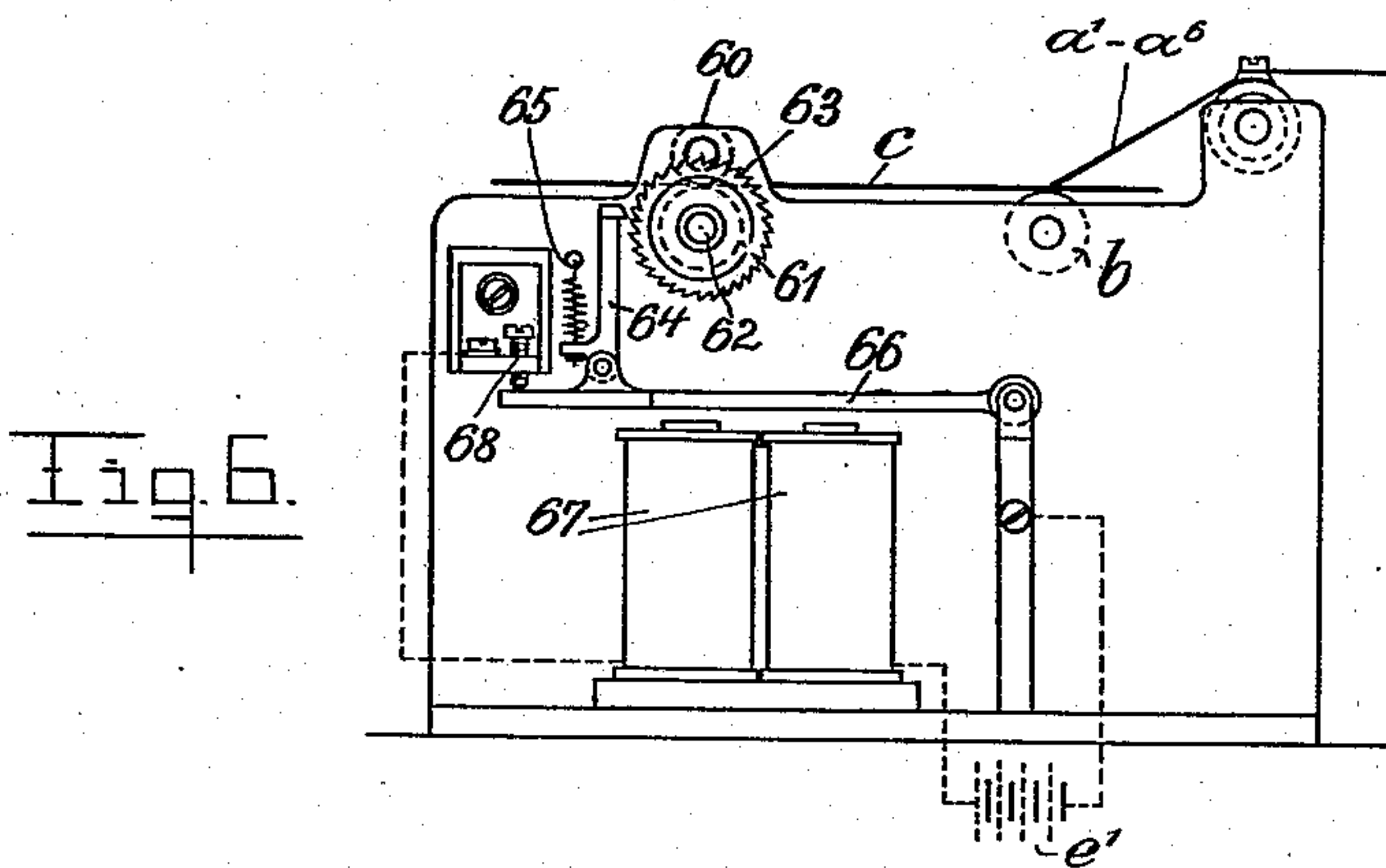
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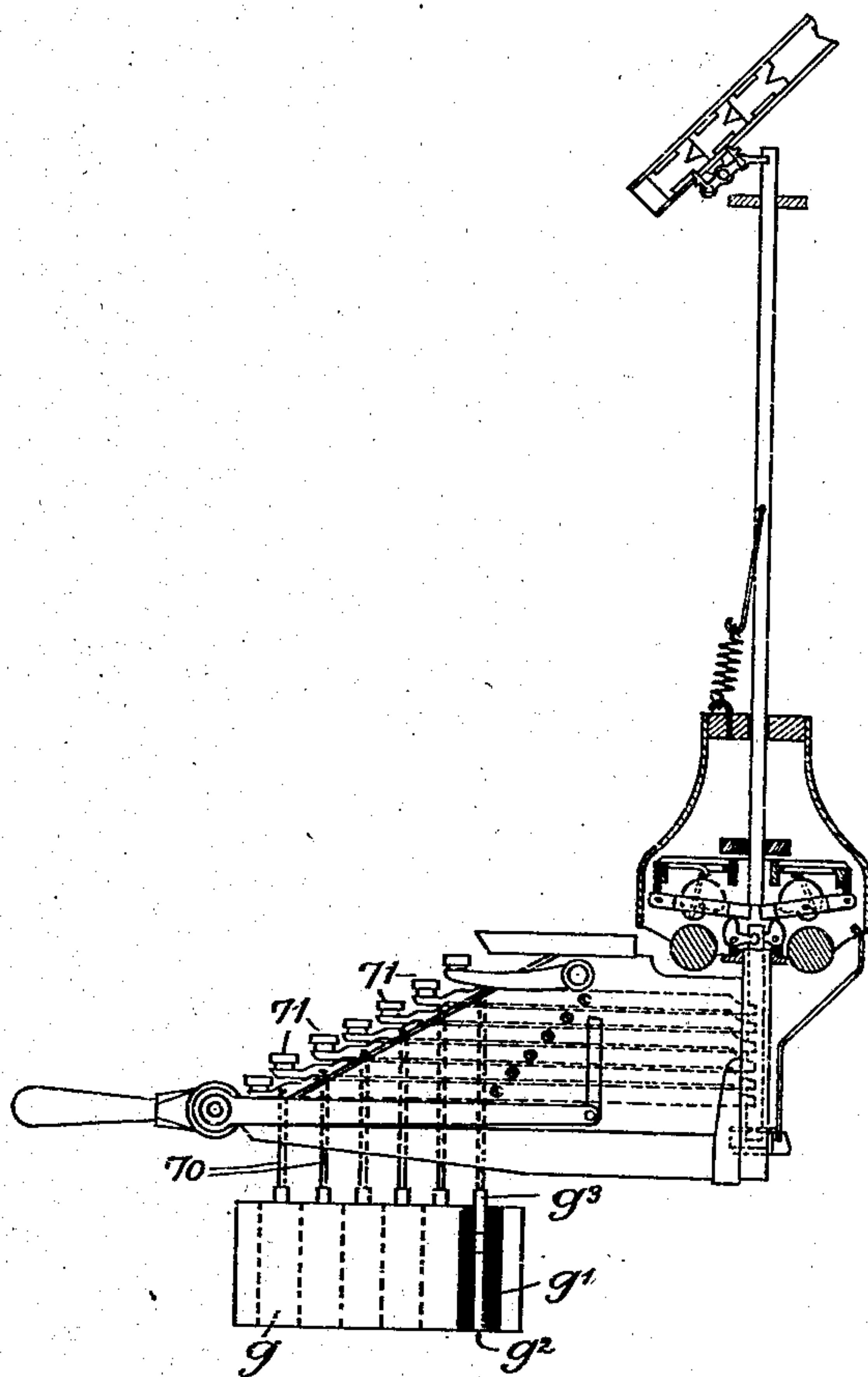


Fig 8

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UNITED STATES PATENT OFFICE.

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MEANS FOR ELECTRICALLY OPERATING TYPE-SETTING MACHINES.

No. 915,748.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed June 11, 1907. Serial No. 378,393.

To all whom it may concern:

Be it known that I, HEINRICH DREWELL, engineer, subject of the German Emperor, residing at Pertalozzistrasse 9, Charlottenburg, near Berlin, Germany, have invented new and useful Improvements in Means for Electrically Operating Type-Setting Machines, of which the following is a specification.

10 The present invention relates to means for canceling or neutralizing the effect of groups of holes which have been punched incorrectly in register bands used for operating type setting and composing machines.

15 Type setting machines are already known, in which the casting and composing of types is controlled by a perforated band, which, when the band contains errors, also contains the representation of a stop or canceling action which stops the action of the casting and composing device until the incorrectly perforated holes on the band have passed the machine. Hitherto in these machines it has been possible to omit whole lines only; even 20 if one character of the line was incorrectly perforated, the whole line had to be canceled and the perforation of the line had to be repeated. The present invention, however, provides very simple means for canceling both single characters, and groups of characters of optional length. Another advantage of this invention is that the stop action or the subsequent releasing action occurs immediately when the respective holes come into the 25 machine. For this reason only it is possible to cancel other parts of the perforated matter than whole lines, for example single characters or words, and to avoid unnecessary loss of time.

40 The means hereinafter described in accordance with the present invention are particularly suitable for employment in matrix or type composing machines in which the matrix or type releasing devices are operated by electromagnets, the latter being controlled by the perforated band. The employment of the invention is not limited however to this kind of machine.

50 To attain an immediate effect of the canceling and subsequent releasing holes when they come into the type setting machine the operation of the machine is stopped by disconnecting the character controlling electromagnets from the source of electric power, this disconnection being brought about by 55 using the ordinary character selecting means

in a suitable manner. No special space is required in the width of the band for the canceling holes, because any combination of the ordinary character selecting holes may be 60 used for canceling single characters or groups of characters.

In order that the invention may be clearly understood reference is made to the accompanying drawings in which connections are 65 represented diagrammatically, by way of example, which can serve the purpose stated above, and in which the mechanism for feeding the register band and the mechanism by which the electromagnets are operated in a 70 machine of the Mergenthaler type are also represented.

In the drawings:—Figure 1 shows an arrangement by means of which single groups of holes are neutralized or made ineffective; 75 Fig. 2 represents a portion of a perforated band with groups of holes which are made ineffective; Fig. 3 shows an arrangement for canceling the effect of a longer row of holes; Fig. 4 is a variation of the arrangement 80 shown in Fig. 3, whereas Fig. 5 represents a portion of a register band upon which a longer series of holes is made ineffective. Fig. 6 is a side elevation and Fig. 7 a plan of the mechanism for feeding the register-band, 85 whereas Fig. 8 is a side elevation, partly in section, of the mechanism by which the electromagnets are operated in a linotype machine of the Mergenthaler type.

The connection shown in Fig. 1 substantially agrees with the parts of the connection 90 which are already known and described in a prior patent No. 864,519, which serves for distributing electric currents by means of a register band in such a manner that the electromagnet which corresponds to the perforation of the band at any time is operated. The arrangement of the connection is as follows:—*e* is the source of current, *d* the contact brush which connects the roller *b* with 100 the source of current *e*; *a*¹, *a*², *a*³, *a*⁴, *a*⁵, *a*⁶, are six more contact brushes which lie on the roller *b*. The register band *c* is passed between the brushes *a*¹ to *a*⁶ and the roller *b* and it permits some of the brushes *a*¹ to *a*⁶ 105 to contact with the roller *b* as soon as two of the holes in the band pass between the roller and the brushes. Electromagnets *g* are connected in groups with the brushes *a*¹ to *a*⁵, and the coils 2' to 6' of the automatic switches 110 *f*² to *f*⁶ are connected with the brushes *a*² to *a*⁶. The armature levers *f*² and *f*³ of the

automatic switches connect the electromagnets g with the other pole of the source of current e by means of the conductors l and l^1 . When two holes of the register band pass simultaneously under two of the brushes a^1 to a^6 , a circuit is formed through one of the electromagnets g with the coöperation of one of the corresponding automatic switches f^2 to f^6 . The electromagnet g which is put in circuit becomes energized and causes the corresponding matrix or type to be composed. In this arrangement all the groups of holes consist of two holes. Any of these possible pairs of holes can be used for making pairs of holes inoperative which have been punched falsely. Suppose for example that the group of holes i^1 (Figs. 1 and 2) which effects a simultaneous contact of the brushes a^2 and a^3 shall act as a correction symbol. For this purpose the arrangement as above described is altered as follows:—

The armature levers of the automatic switches f^2 to f^6 , which are in connection one with another through the conductor l , are not connected directly with the source of current, but by means of two contacts h^2 and h^3 which are connected in parallel by the conductor l^1 connected with the source of current; these contacts serve as stops limiting the normal position of the armature levers which belong to the coils $2'$ and $3'$ of the first two switches f and which open the circuit as soon as the current flows through the coils. Now as long as one of these contacts h^2 or h^3 is open the manner in which the arrangement works is not disturbed; as soon as both contacts are opened simultaneously however, the supply of current to the electromagnets g , g of the type controlling mechanism is interrupted, whereas, on the contrary, the coils $2'$, $3'$ remain connected with the source of current. The interruption in the supply of current to the magnets g , g continues, however, just as long as the brushes a^2 and a^3 contact with the roller b through the group of holes i^1 , and ceases again when these holes no longer influence the brushes. In accordance with the present invention the arrangement is such that a group of two correction holes i^1 which belong to the brushes a^2 , a^3 is punched in the same transverse row of the band with the false ones, that is with the group consisting of the two holes x^1 , x^5 which are to be made inoperative (Fig. 1).

Fig. 2 shows a portion of a band in which two canceling groups i^1 , i^2 , have been subsequently punched. All the four holes at both the places are made inoperative with respect to the electromagnets controlling the type in the manner above described.

It follows from the manner in which the arrangement in Fig. 1 works as above described that more than two contacts, such as h^2 , h^3 , which are connected in parallel can effect the supply of current to the armature

levers of the automatic switches f^2 to f^6 . But all the contacts must be interrupted simultaneously when the correction symbol is in action. The correction group must thus contain a hole for each of the contacts which are connected in parallel. If a somewhat long series of holes is to be made inoperative, in accordance with the present invention the correction symbols or holes for interrupting the current must be added to each group of holes. As this would be very troublesome and as it would occupy much time another arrangement is indicated in Fig. 3 in which one definite symbol or hole interrupts the current until another symbol or hole closes it again. In this arrangement the armature levers of the automatic switches f which are connected with each other by a conductor l must likewise be separated from the battery e , only not by the armature lever itself, but by a special switch k which is under the action of or controlled by two electromagnets p and q . The switch k is connected with the source of current e by a conductor l^2 and with the armature levers by a conductor l and in its normal position makes contact with a contact s and thereby connects the levers of the automatic switches f with the source of current e . The electromagnet q has a coil t in circuit instead of that of the type-electromagnet g , g corresponding to the combination of armature lever and brush 1, 6. As soon as the corresponding groups of holes in the band c are situated under the brushes a^1 to a^6 , the electromagnet q is energized and the lever k is withdrawn from the contact s . The circuit of the electromagnets g is thereby interrupted. The lever k now lies against the two contacts r which connect two coils n and m on the electromagnet p to the source of current e . These coils are connected on the other side with the brushes a^1 and a^5 and receive current as soon as the group of holes x^1 , x^5 passes under the appertaining brushes. The lever k is so arranged that it remains in the position which it occupies at any time until it is moved over by one of the electromagnets p or q . The manner in which it works may be brought about in known manner by the entire switching means including lever k and electromagnets p and q with coils m , n , t being made like a polarized relay such as is used in telegraphy for operating with two currents. Further, the electromagnet p is so proportioned and adjusted that it only works when both its coils m and n have current flowing through them simultaneously. In this connection therefore, the group or combination of holes x^1 , x^6 acts as circuit breaker and the combination x^1 , x^5 as circuit closer.

In Fig. 5 in which a portion of a register band is shown in which the combination of holes x^1 , x^6 and x^1 , x^5 are added at z^1 and z^2 to the incorrect combinations which are pres-

ent, it is taken for granted that the bands run through the contact device of the composing machine in the direction of the arrow u so that the row z^1 of holes acts first. This then interrupts the current until the row at z^2 closes it again. At z^1 and z^2 there are other holes besides the holes x^1 , x^6 and x^1 and x^5 which are necessary for removing the errors. In order that no uncertainty may arise at z^1 , the lever k must be moved very quickly so that it interrupts the current before the electromagnets which control the types are operated. The rapid movement of the lever k at z^2 would however bring about the disadvantage which is thereby avoided at z^1 ; for when the circuit at the contact s is closed too early, the electromagnets which control the type are operated simultaneously by the groups of holes at z^2 . This disadvantage can be avoided in various ways. For example, the holes x^1 and x^5 which effect the closing of the circuit may be set back from the remaining ones so much that the circuit is closed too late in order to allow the remaining holes of the row to act, as shown in dotted lines in Fig. 5. Namely in this figure the holes x^1 , x^6 on line z^1 are represented in dotted lines in an advanced position for the purpose of interrupting the current in time. Another possible manner of avoiding this defect consists in a group of holes for closing the circuit being employed which is used repeatedly on the band for other reasons, for example the sign for the end of the line, which sign does not contain holes which are able to actuate type. In this case it is true only whole lines or those which are begun can be removed, which however is not disadvantageous because the removal of single parts of a line generally leads to difficulties. A double action of the sign which could take effect before z^1 and at z^2 is then not inconvenient.

A third method of removing an unintentional effect of the correction sign for closing a circuit leads to the connection which is indicated in Fig. 4. In this case the employment of the connection in Fig. 1 is combined with that in Fig. 3 by the coils m , n of the electromagnet p (Fig. 4) being connected in series with the coils $2'$ and $3'$ of the automatic switches f . Further, the conductor from the contact s is not led directly to the armature levers belonging to the coils $2'$ and $3'$ of the first two switches f , but first to two contacts h^2 and h^3 which are arranged symmetrically and act as in Fig. 1. The coil t of the electromagnet q is likewise connected as in Fig. 3. The manner in which this arrangement works is as follows: The correction symbol for interrupting the current acts just as in the connection according to Fig. 3. The correction symbol for closing the circuit does not now consist of the holes x^1 , x^5 however, but of the

holes x^2 , x^3 . When these come into action the lever k is returned to the contact s . But the circuit of the electromagnets for operating the types is simultaneously interrupted at h^2 and h^3 for the entire period of the correction symbol for closing the circuit and is only completely closed when the lever of the automatic switches $2'$ and $3'$ return into their normal position. Thus there is no uncertainty with regard to the point of time when the circuit is closed. The arrangement according to Fig. 4 moreover gives the possibility of making single errors inoperative by the combination of holes x^2 , x^3 .

In Figs. 6 and 7 is shown the mechanism for feeding the register band. In these figures c is the register band which passes first over the contact roller b and then between the feed-rolls 60 and 61. On the axle 62 of the roll 61 is located a ratchet-wheel 63, the teeth of which are engaged by a pawl 64. The pawl 64 is pressed by spring 65 on the teeth of the wheel 63 and is attached to the armature 66 of the electromagnet 67. The electromagnet is located in the manner of an automatic interrupter in the circuit of the source of current e^1 . In the circuit is a contact-screw 68 against which the armature 66 rests when the electromagnet 67 is not excited. As soon as the circuit of the source of current is closed the electromagnet 67 attracts its armature 66 and moves the ratchet-wheel 63 by means of the pawl 64. The current passing simultaneously through the electromagnet 67 is interrupted at the contact-screw 68 and the armature 66 is returned by the action of the spring 65. This action is repeated as long as the circuit of the electromagnet is not interrupted at some other place and the ratchet-wheel 63 is rotated a tooth at a time. With the same there is moved the small feed-roll 61, which again feeds the paper band c . For each type which is to be set the register band has two holes x , i etc. which are placed simultaneously under the brushes a^1 to a^6 and close the corresponding circuits.

Fig. 8 illustrates the mechanism by which the electromagnets are operated in a linotype machine of the Mergenthaler type. The mechanism for releasing the matrices is of the usual form, and therefore needs no description. Under the keys of this apparatus are placed the electromagnets g shown in Fig. 1. They consist of a coil g^1 , core g^2 and armature g^3 . The armature is connected by means of a rod 70 with the corresponding key-lever 71. When the current flows through the coil g^1 , the core g^2 pulls the armature g^3 down, the key is depressed, and the known releasing mechanism is brought into operation.

It will be readily understood that the arrangements indicated above are capable

of employment in other connections which serve for distributing currents corresponding to the perforation of the band. Consideration must however be paid to the fact
5 that all the holes of a combination or group which is used for canceling single mistakes must act on switches of the kind described as forming part of the embodiments of the present invention.

10 Generally speaking the arrangements hereinbefore described in accordance with the present invention have the advantage that symbols for opening and closing the circuits are in the same transverse row of the band
15 with other symbols and accordingly can be punched subsequently.

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

1. In means for the electric operation of
20 typesetting machines, wherein a plurality of character electromagnets are directly controlled by a plurality of automatic switches, and the circuit connections for said automatic switches are controlled by a register
25 band containing character selecting holes, the combination with the switch levers of said automatic switches, of a conductor common to the switch levers, and switching means connected with the circuit connections
30 and adapted to connect said common conductor with and disconnect the same from the circuit connections, said switching means being operated by suitable combinations of holes in the band, the holes of these combinations being chosen from the ordinary character selecting holes, as set forth.

2. In means for the electric operation of
typesetting machines, wherein a plurality of character electromagnets are directly controlled by a plurality of automatic switches,
40 and the circuit connections for said automatic switches are controlled by a register band containing character selecting holes, the combination with the switch levers of
45 said automatic switches, of a conductor common to the switch levers, and an automatically operated switch connected with the circuit connections and adapted to connect said common conductor with and disconnect the same from the circuit connections,
50 said automatically operated switch being operated by suitable combinations of holes in the band, the holes of these combinations

being chosen from the ordinary character selecting holes, as set forth. 55

3. In means for the electric operation of typesetting machines, wherein a plurality of character delivery electromagnets are directly controlled by a plurality of automatic switches, and the circuit connections for said
60 automatic switches are controlled by a register band, the combination, with the switch levers of said automatic switches, of a switch lever (*k*), two electromagnets for operating the latter, electrical connection,
65 substantially as shown, connecting said switch lever (*k*) and its electromagnets with the circuit connections, and a conductor common to the switch levers of the automatic switches adapted to be connected with
70 and disconnected from said lever (*k*) by said electromagnets, the electrical connections of the lever (*k*) and its electromagnets with the circuit connections being such that the lever is operated by suitable combinations of
75 holes in the band, the holes of these combinations being selected from the ordinary character selecting holes, as and for the purpose specified.

4. In means of the character described for
80 the electrical operation of type-setting machines, the combination with a source of current, a contact roller, a sliding contact connecting the source of current with said roller, and the circuit connections including
85 a plurality of character electromagnets controlled by a plurality of automatic switches, of a conductor (*l*) common to the switch levers of the latter, a lever (*k*) connected with the source of current and adapted to
90 contact said conductor (*l*), an electromagnet having two windings for bringing said lever into its operative position, a second electromagnet for bringing said lever into its in-
95 operative position, and conductors, substantially as shown, connecting said latter electromagnets with the circuit connections, substantially as shown for the purpose specified.

In testimony whereof I have signed my
100 name to this specification in the presence of two subscribing witnesses.

HEINRICH DREWELL.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.