

W. F. C. M. McCARTY.
MULTIPLE CIRCUIT CLOSER.

No. 300,098.

Patented June 10, 1884.

Fig. 1.

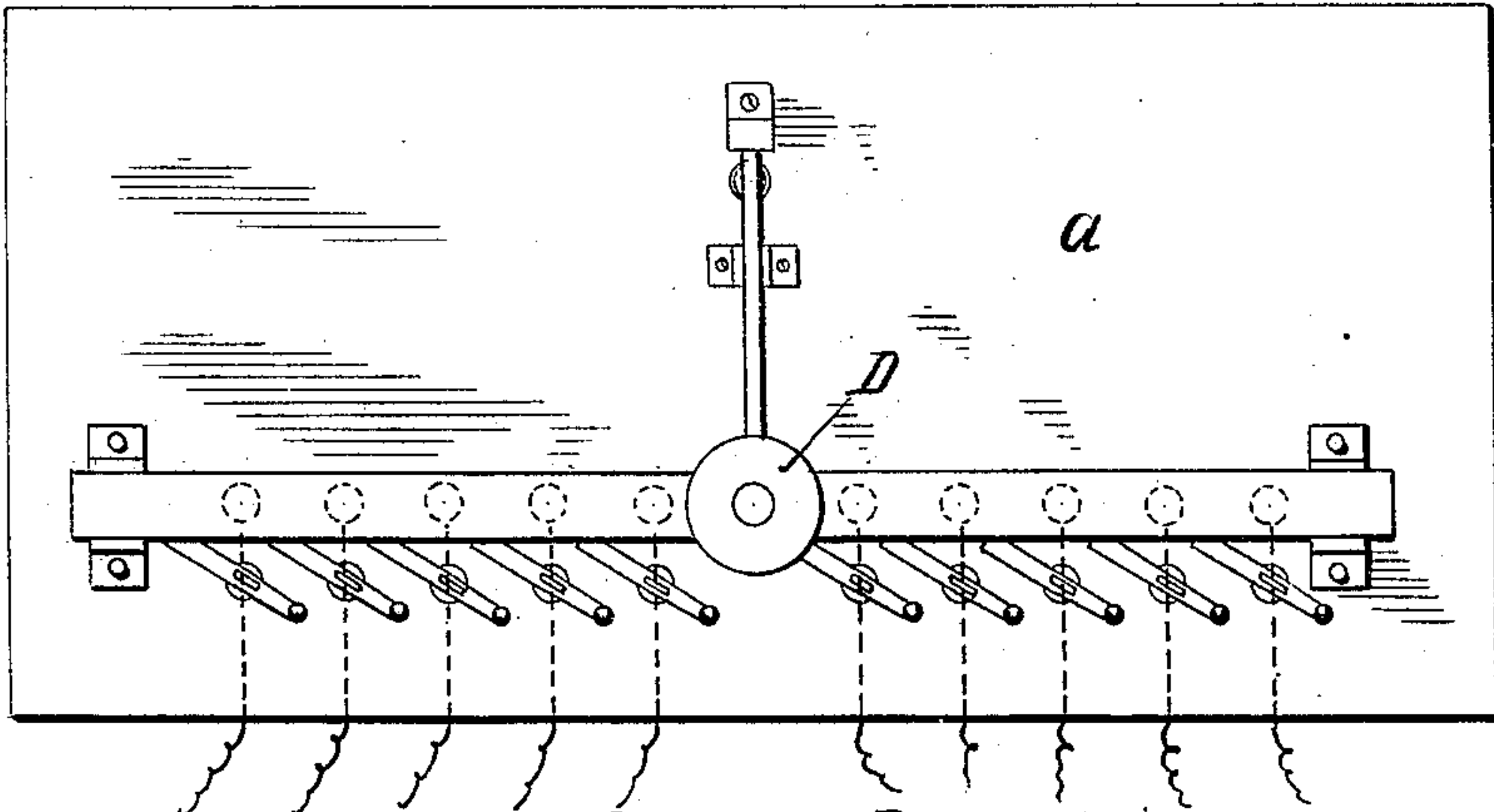


Fig. 2.

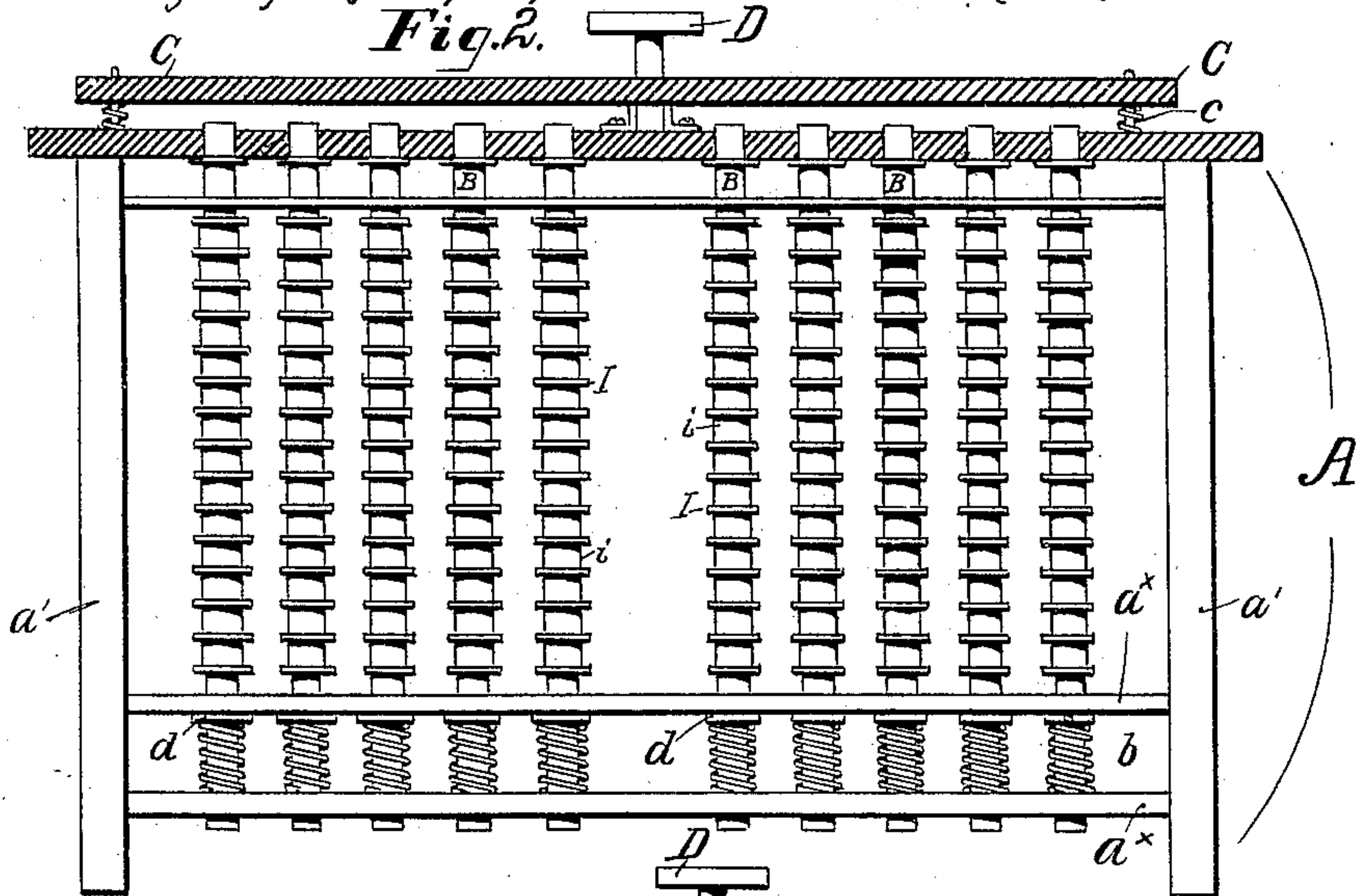
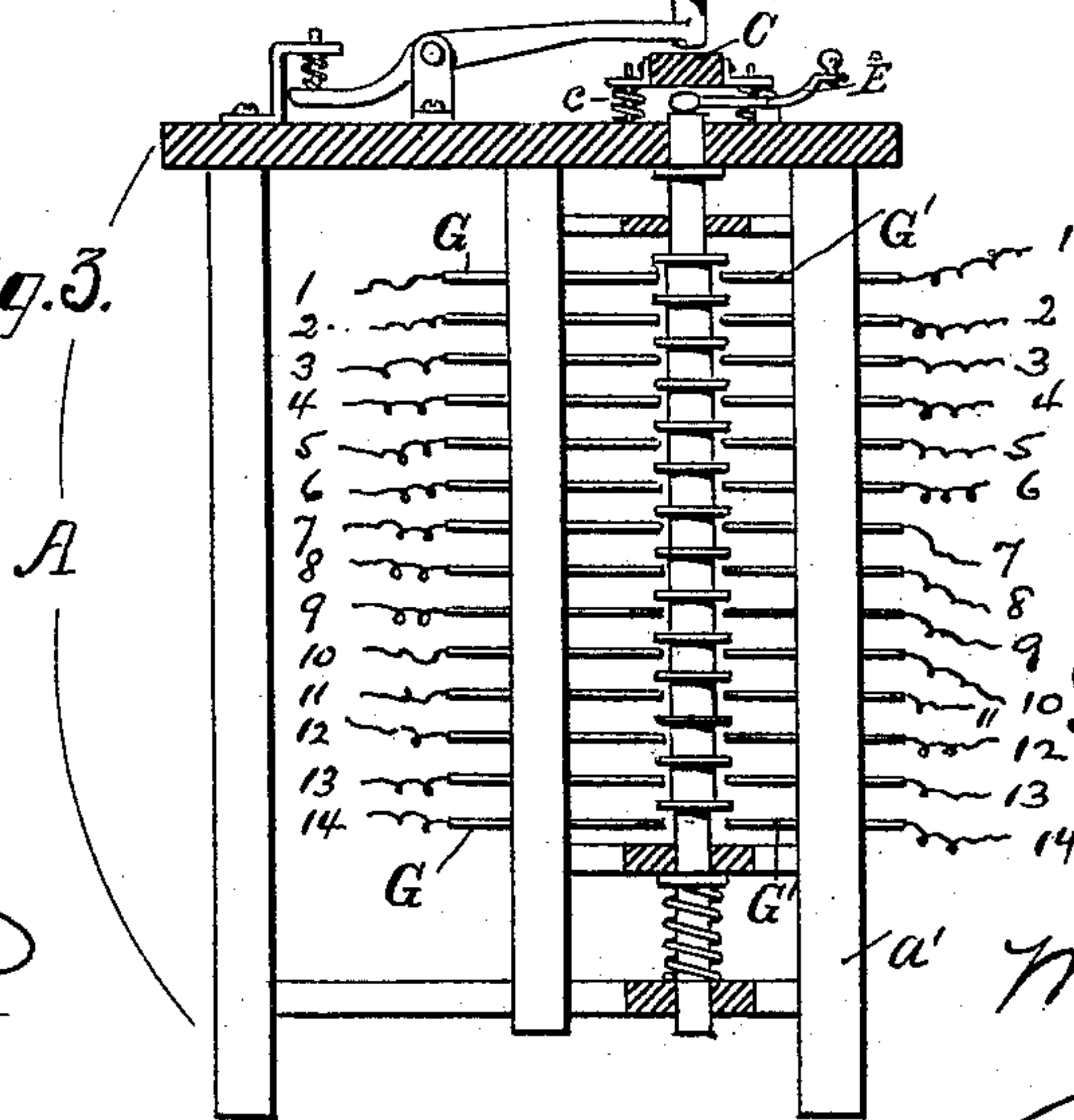


Fig. 3.



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(No Model.)

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2 Sheets—Sheet 2.

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Fig. 4.

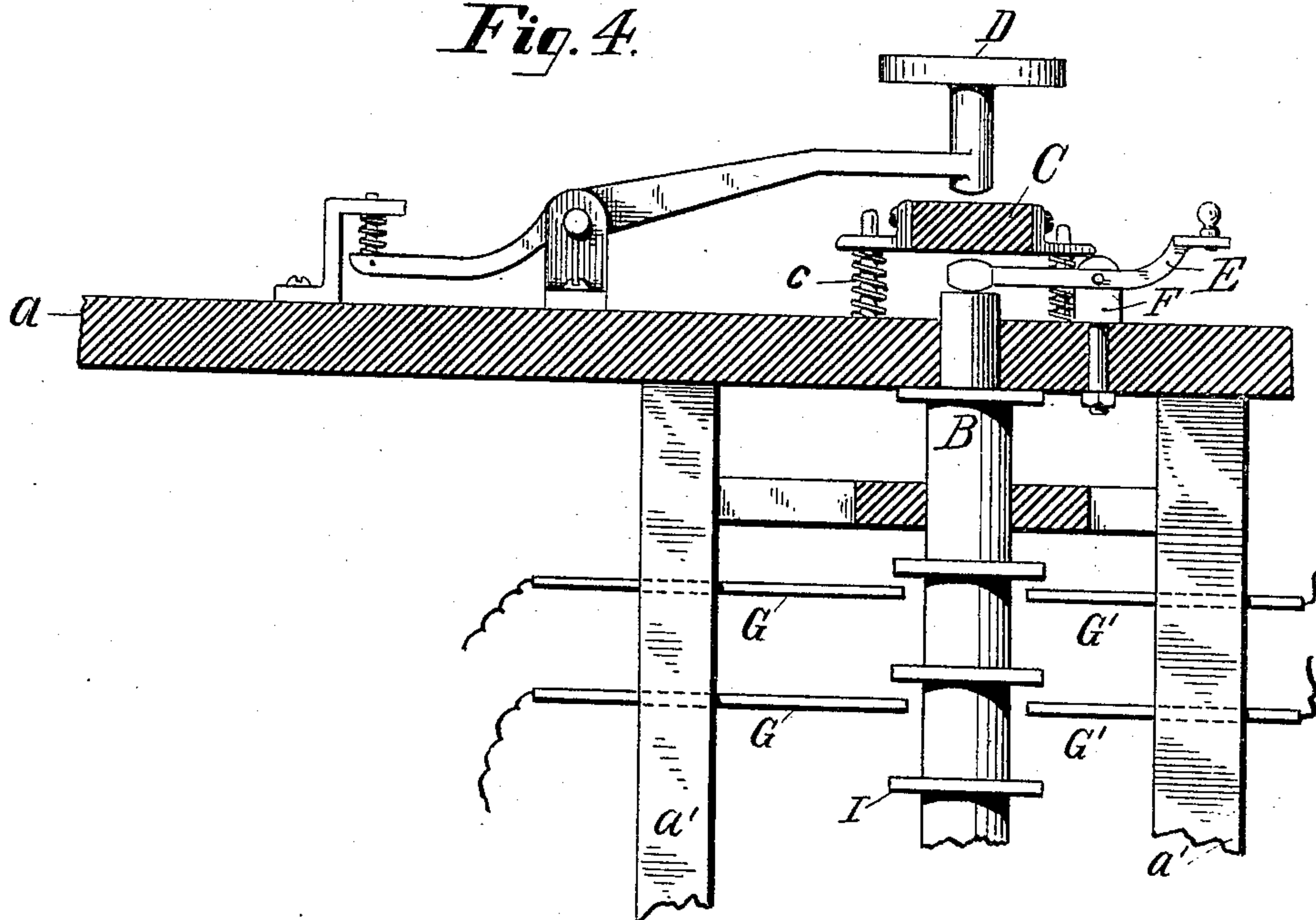


Fig. 6.

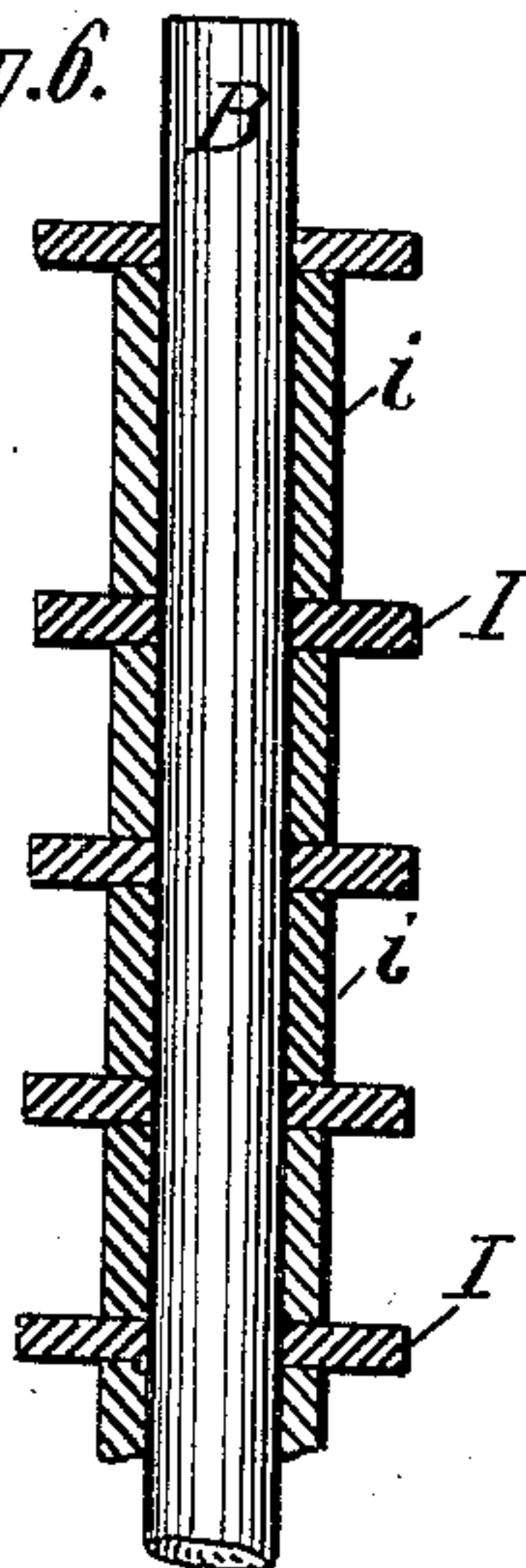
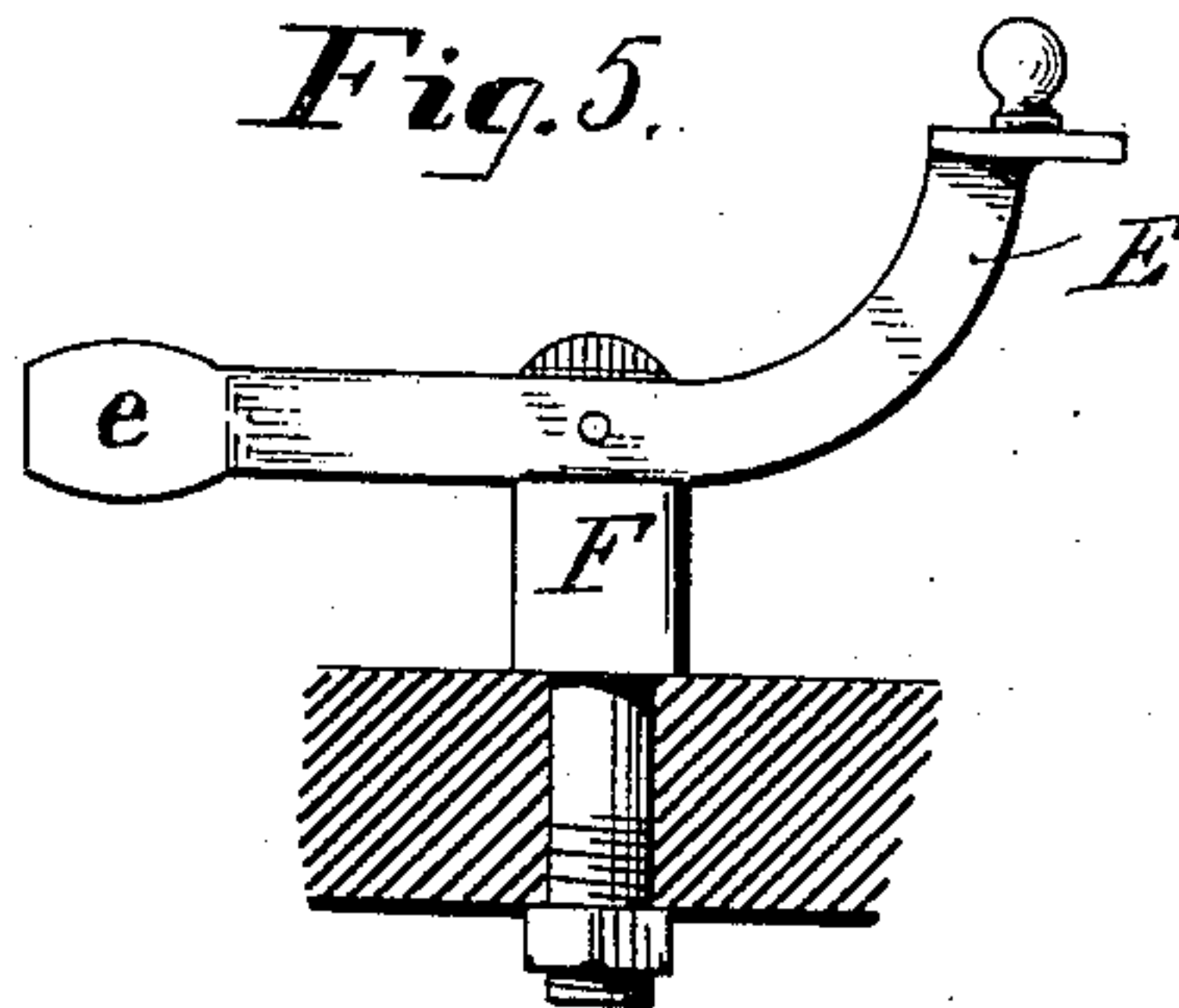


Fig. 5.



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UNITED STATES PATENT OFFICE.

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MULTIPLE-CIRCUIT CLOSER.

SPECIFICATION forming part of Letters Patent No. 300,098, dated June 10, 1884.

Application filed January 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FITZ CHARLES MASON McCARTY, a citizen of the United States, residing at St. Petersburg, Russia, have
5 invented certain improvements in apparatus for the production and simultaneous transmission of a series of similar electrical impulses or currents to different termini, of which the following is a specification.

In the utilization of electrical currents it is often desirable and of great advantage to be able to control automatically by a single apparatus a number of electric circuits, (derived
5 either from a single or from separate sources of current,) which are entirely independent of each other, and which have termini locally or geographically apart, in such a manner that given impulses or currents may be simultaneously transmitted or set up in said circuits.

20 An apparatus conveniently embodying a preferred form of my invention is represented in the accompanying drawings, and hereinafter described.

In carrying my invention into effect I make
25 use in the first place of a series of any suitable electric circuits or continuous electrical connections through which a current is intended to be set up, preferring, however, to employ wires of any ordinary character. I also provide such suitable sources of current as may
30 be desired, and, in connection with the series of separate electric circuits aforesaid, employ an apparatus substantially of the character of that represented in the drawings, and hereinafter more particularly described, the said apparatus being one adapted to readily and reliably accomplish the object of the invention.

In the construction of the foregoing apparatus I preferably make use of a casing, framing, housing, or kindred containing device of
40 insulating material or mounted on a suitable insulating-base, as is ordinarily the custom in electrical instruments. This casing contains and supports the operative parts of the apparatus and the terminals of all the separate circuits.
45

In the accompanying drawings, A represents the above casing, consisting, conveniently, of a top or table, *a*, erected upon suitable standards, *a'*. The casing is adapted to contain one
50 or a series of traveling rods, B, (represented in

detail in Figures 4 and 6,) the same being formed of ebonite or other insulating substance, and, being in the form represented in the drawings, so introduced into the casing as to be
55 capable of a slight vertical movement with respect thereto. The upper extremities of said rods pass through apertures in the table, which conveniently serve as guides or slide-bearings for said extremities, the said apertures being preferably in line, in the manner
60 shown in Figs. 1 and 2. The lower extremities of the traveling rods are conveniently stepped in framing-bars *a^x*, being a part of the casing, and are encircled by spiral springs
65 *b*, interposed between said framing-bars and collars *d* or kindred devices on the traveling bars, which springs are adapted to resist the downward thrust of said traveling rods, and by their resilience to return or lift them to
70 normal position. Other devices than spiral springs, collars, and framing-bars may of course be substituted for the purpose of lifting or returning to a given normal position the said traveling rods. I simply instance the de-
75 vices described as convenient for the purpose.

Erected and supported above the table is what I term an "impulse-bar," C, the same being a rigid bar of any material, formed to cover the upper extremities of all the travel-
80 ing rods. It is conveniently mounted at its extremities upon four supports, *c*, the same being preferably springs which are adapted to be compressed when the bar itself is depressed. Other supports may be substituted
85 for springs, or, in fact, all supports, as such, be dispensed with. The impulse-bar is best actuated by a finger-key, D, of any usual construction, and conveniently of that represented in Fig. 4. This key may itself be actuated
90 by a secondary coil or otherwise, if desired.

It is obvious that if the impulse-bar be depressed so as to encounter the traveling rods the latter will also be depressed.

In the arrangement of the parts represented,
95 and for the reasons hereinafter set forth, a series of switch-keys, E, are adapted to be interposed between the impulse-bar and the traveling rods, so that when the impulse-bar is depressed it makes contact with the switch-
100 keys, and through the latter with the traveling bars. Each switch-key is pivoted to a

swivel-stud, F, as represented in Figs. 4 and 5, the said swivel-stud being adapted to be rotated upon or with respect to the table, and so to rotate the switch-key away from beneath the impulse-bar. That extremity of the switch-key which is adapted to be interposed between the impulse-bar and the traveling rod with which said switch-key is intended to operate is conveniently made oval-ended, as clearly represented at *e* in Fig. 5, so as to permit of the tilting of the switch-key in the depression of the impulse-bar without interfering with the contact of the impulse-bar and extremity of the traveling rod with said switch-key.

G G' are a set of terminals, suitably formed or supported in successive equidistant or other predetermined order in the casing, and connected with a series of circuits designated in Fig. 3—for instance, as from 1 to 14. A series of these circuits is arranged in connection with each traveling rod employed. The terminals of each series of circuits are preferably placed upon opposite sides of the traveling rods, as shown in Figs. 3 and 4. Each of the traveling rods is equipped with a series of conducting contact-bars, I, arranged in successive equidistant or other predetermined order, correspondent to that of the terminals aforesaid, on said bars, and so relatively disposed with respect to said terminals of the said circuits that when a given traveling rod is depressed the contact-bars which it carries are brought into contact with opposing pairs of terminals of the circuits in connection with said rod, so as to establish connection between each of said pairs of terminals simultaneously. The contact-bars are conveniently made in the shape of disks of metal, as shown in Figs. 4 and 6, which are conveniently held apart at suitable predetermined intervals by means of collars *i*, of ebonite or kindred non-conducting material, which are adapted to be slipped upon the traveling rods. Other devices than disks may of course be employed. Disks are simply the most convenient contrivances. The terminals are either rigid or flexible, and are spaced to correspond to the spacing of the contact-bars of the traveling rods.

In the accompanying drawings, Figure 1 is a top plan view of an apparatus conveniently embodying my improvements, and equipped with ten traveling rods, each having connections with fourteen circuits, the switch-keys being represented as all thrown out of range of contact with the traveling rods. Fig. 2 is a longitudinal vertical sectional elevation, and Fig. 3 a transverse elevation, of the apparatus represented in Fig. 1. Fig. 4 is a transverse sectional elevational detail of the principal operative parts of the apparatus; Fig. 5, a detail of one of the switch-keys, and Fig. 6 a detail of one of the traveling rods.

Similar letters of reference indicate corresponding parts in all the figures.

Such being a description of a convenient construction of my apparatus, it is obvious that when the switch-keys are in such posi-

tion relatively to their swivel as to be interposed between the impulse-bar and the series of traveling rods with which they respectively operate a depression of said impulse-bar—such as is caused, for instance, by the finger-key—will occasion the tilting of all of the switch-keys, the depression of all of the traveling rods, and the contact of all of the contact-bars with which said rods are equipped with the terminals with which they respectively operate, so as to make connection throughout all of the circuits which are in connection with said traveling rods, whereby in, for instance, such an apparatus as is represented in Figs. 1 and 2, in which ten traveling rods, each operating in connection with fourteen circuits, are represented, one hundred and forty circuits would be instantly established. When, on the contrary, it is desired not to throw into operation any particular series of circuits, by simply swiveling out of range any given switch key or keys any given single series or separate series of circuits are thrown temporarily out of operation, the descent of the impulse-bar being without effect upon such traveling rod or rods as are for the time being not covered by their switch key or keys. The entire switch-key arrangement is therefore one of convenience, and when it is desired uniformly to actuate all of the traveling rods with which the casing is equipped the impulse-bar may be arranged to make direct contact with said traveling rods.

It is obvious that many purely mechanical changes both in the construction and arrangement of my apparatus may be made without departing from the principle of the invention. The arrangement represented is simply a cheap and convenient arrangement. Thus, for instance, I can use a secondary coil or magnet either to actuate the impulse-bar direct or to actuate the finger-key. The principle of the invention residing in the arrangement of the traveling rods, which are equipped with the contact-bars, and are thereby adapted, when depressed, to establish connection simultaneously through a series of independent circuits, it is also obvious that any required number of traveling rods, or their equivalent, may be arranged in any suitable casing or housing, and that they may be equipped with any desired number of contact-bars, and may make connection each with any desired number of separate circuits.

The reception of the impulses so as above adapted to be transmitted by means of the apparatus described may be by any of the well-known processes, chemical or mechanical, or by the ordinary Morse register or sounder. The uses of the device are not, moreover, confined to telegraphic purposes. As constructed this device may be used to control a number of independent electric circuits, so as to transmit the same impulse or message to a number of points simultaneously, in ordinary telegraphy forming practically a multiplex telegraph; or it may be used to control the cur-

rent to a series of torpedoes or other explosives in warfare or mining, or for the firing of broadsides. Again, the apparatus may be employed, in connection with properly-prepared fillets or bands, as a transmitter of facsimile or Roman-letter messages, this latter arrangement requiring certain modifications which will be explained in a subsequent application for patent.

10 I have described a series of traveling rods. It is proper for me to state that my apparatus would be equally operative with but a single traveling rod provided with contact-bars making connection with two or more circuits, and
15 that in such arrangement it would of course be possible to dispense altogether with the impulse-bar and to occasion the depression of the single traveling rod by the finger or by a finger-key or kindred device.

20 I have also represented and described the traveling rods as adapted to be depressed in order to insure the contact between the contact-bars with which they are provided and the terminals of the circuits. It will be easily understood that any mechanic could so arrange
25 the apparatus as to cause the contact aforesaid to result from an upward or from a lateral movement of the said traveling rods.

It is also obvious that the casing, housing, or framing represented may be modified in construction in various ways, its sole office being to contain the assembled operative members of the apparatus in such manner that the terminals are fixedly supported with reference
35 to the traveling rods and contact-bars with which the latter are provided.

Having now described my invention, I claim—

1. In an apparatus for the simultaneous transmission of given electrical impulses to different termini, the combination of a series of independent electrical circuits, each of which is connected with an independent service of current, and is provided with adjacent terminals
40 arranged in predetermined order, a suitable casing, housing, or framing for containing the above-mentioned terminals of all the circuits, a traveling rod provided with a series of contact-bars arranged in predetermined order corresponding to that of the terminals aforesaid,
45 and normally out of contact with said terminals, but adapted to make contact between them, means for actuating the traveling rod so as to bring its contact-bars into contact with
50 said terminals, and means for returning said traveling rod and bars out of the above-mentioned contact, substantially as and for the purposes set forth.

2. In an apparatus for the simultaneous transmission of given electrical impulses to different termini, the combination of a series of independent electrical circuits, each of which is provided with adjacent terminals arranged in predetermined order, a suitable casing,
55 housing, or framing for containing the above-mentioned terminals of all the circuits, a trav-

eling rod or series of traveling rods, each provided with a series of contact-bars corresponding in order and number to the aforesaid terminals, and an impulse-bar common to the
70 traveling rods aforesaid, the arrangement being such that a movement of the impulse-bar occasions a movement of the traveling rods and the contact of the contact-bars with the terminals with which they are respectively
75 adapted to operate, substantially as set forth.

3. In an apparatus for the simultaneous transmission of given electrical impulses to different termini, the combination of a series of independent electrical circuits, each of which
80 is provided with adjacent terminals arranged in predetermined order, a suitable casing, housing, or framing for containing the above-mentioned terminals of all the circuits, traveling rods, each provided with a series of con-
85 tact-bars arranged in predetermined order correspondent with that of the terminals aforesaid, means for returning said traveling rods to their normal position after enforced movement therefrom, and an impulse-bar common
90 to the traveling rods aforesaid, substantially as and for the purposes set forth.

4. In an apparatus for the simultaneous transmission of given electrical impulses to different termini, the combination of a series
95 of independent electrical circuits each of which is provided with adjacent terminals, a suitable casing, framing, or housing for containing the above-mentioned terminals of all the circuits, a series of spring-controlled traveling rods,
100 each provided with a series of contact-bars corresponding in number and order with the terminals aforesaid, an impulse-bar, and switch-keys adapted to be interposed between the
105 traveling rods and the impulse-bar or to be removed from interposition, substantially as and for the purpose specified.

5. In an apparatus for the simultaneous transmission of given electrical impulses to different termini, the following instrumentalities in combination: a series of independent
110 electrical circuits, each of which is provided with adjacent terminals, traveling rods provided with a series of contact-bars corresponding in number and position to said terminals
115 and adapted to make contact between the same, but normally out of contact with said terminals, an impulse-bar common to all of the traveling rods, and adapted to act upon all of them in such manner as to cause their contact
120 with the terminals aforesaid, means for actuating said impulse-bar, and a suitable casing, framing, or housing for containing the said assembled instrumentalities, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name this 15th day of December, A. D. 1883.

WILLIAM F. C. M. McCARTY.

In presence of—

J. BONSALE TAYLOR,

JOHN JOLLEY, Jr.

It is hereby certified that in Letters Patent No. 300,098, granted June 10, 1884, upon the application of William F. C. M. McCarty, of St. Petersburg, Russia, for an improvement in "Multiple-Circuit Closers," an error appears in the printed specification requiring correction, as follows: In line 43, page 3, the word "service" should read *source*; and that the Letters Patent should be read with this correction therein to make it conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 24th day of June, A. D. 1884.

[SEAL.]

M. L. JOSLYN,
Acting Secretary of the Interior.

Countersigned:

BENJ. BUTTERWORTH,
Commissioner of Patents.