

(No Model.)

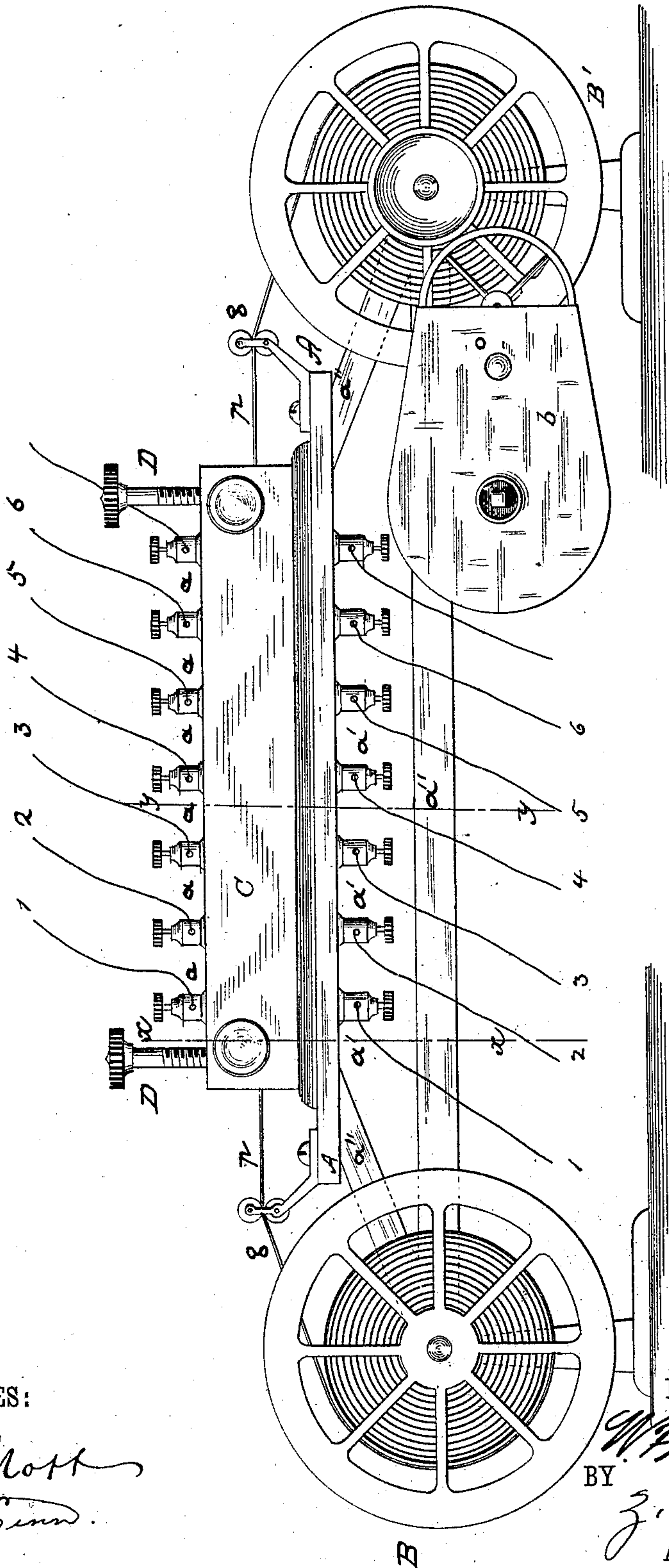
3 Sheets—Sheet 1.

W. FITZ CHARLES M. McCARTY.
MULTIPLE CIRCUIT CONTROLLER.

No. 293,974.

Patented Feb. 19, 1884.

Fig. 1.



WITNESSES:

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(No Model.)

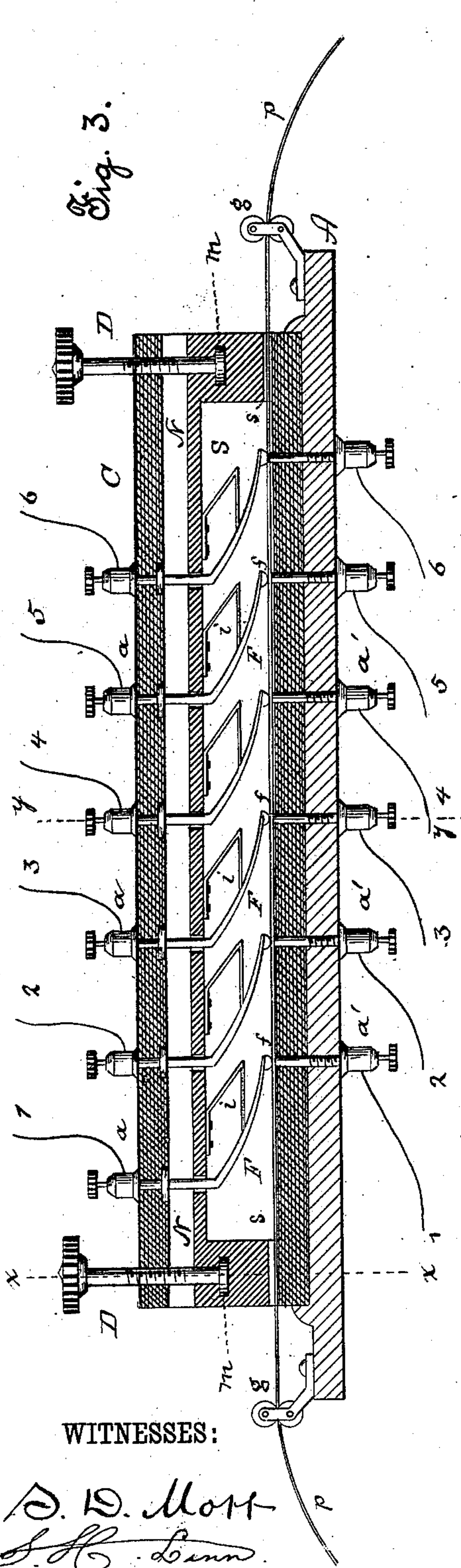
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W. FITZ CHARLES M. McCARTY.

MULTIPLE CIRCUIT CONTROLLER.

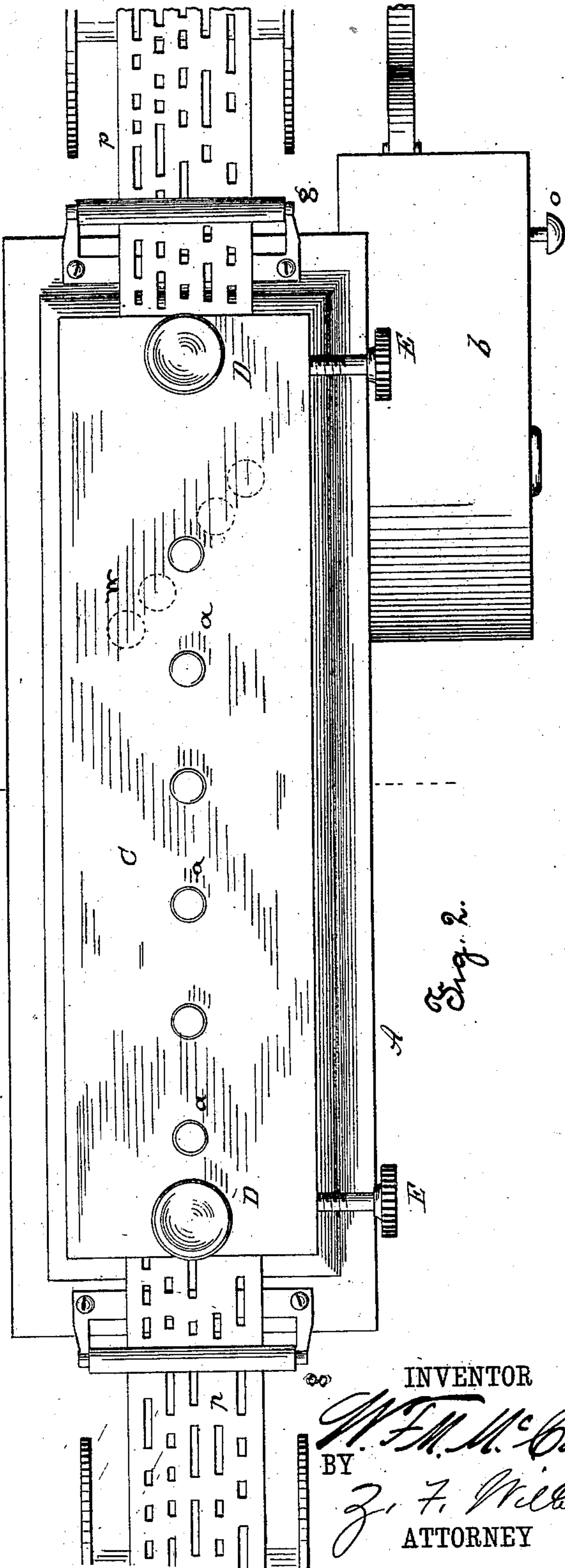
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3 Sheets—Sheet 3.

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MULTIPLE CIRCUIT CONTROLLER.

No. 293,974.

Patented Feb. 19, 1884.

Fig. 5.

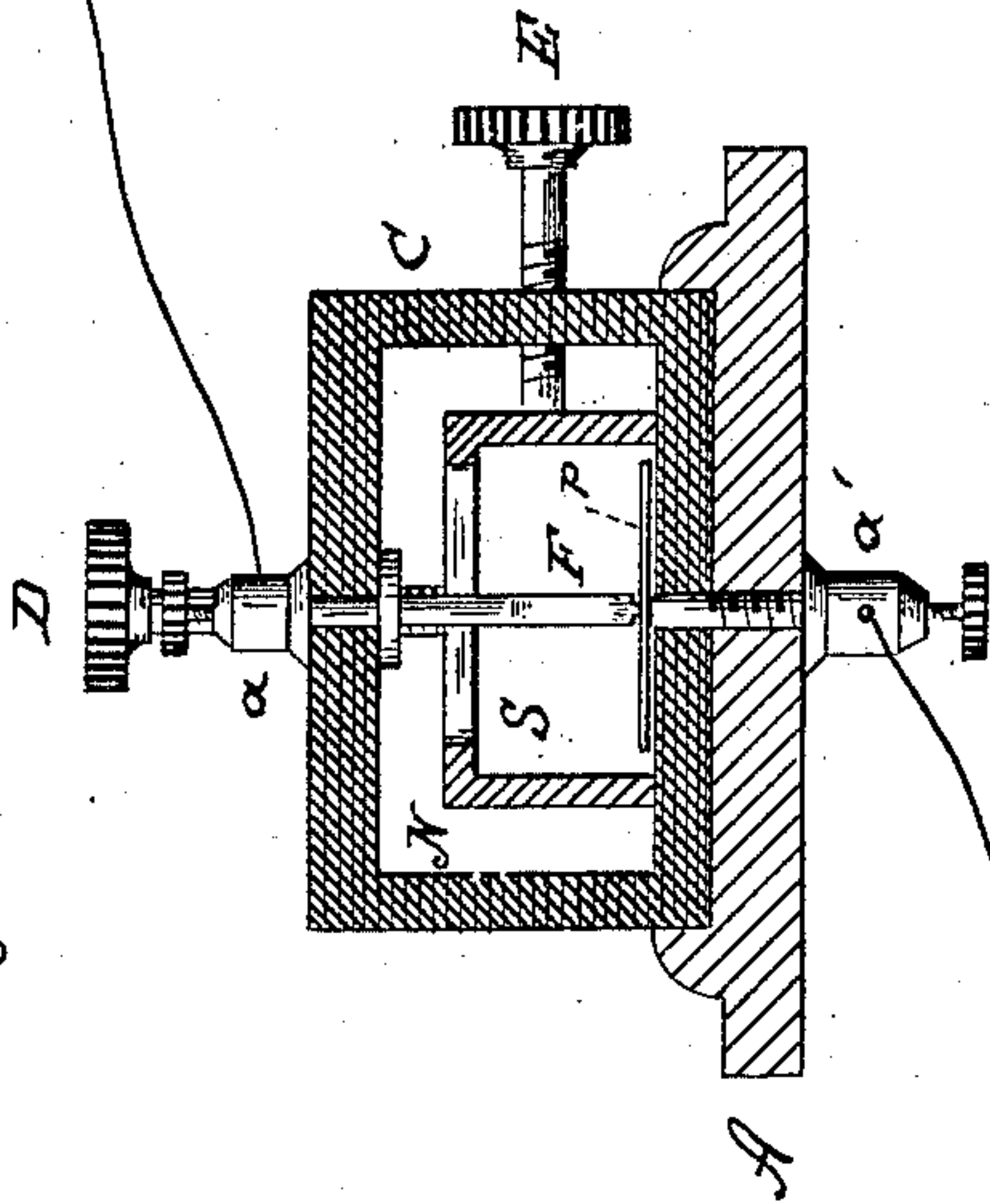
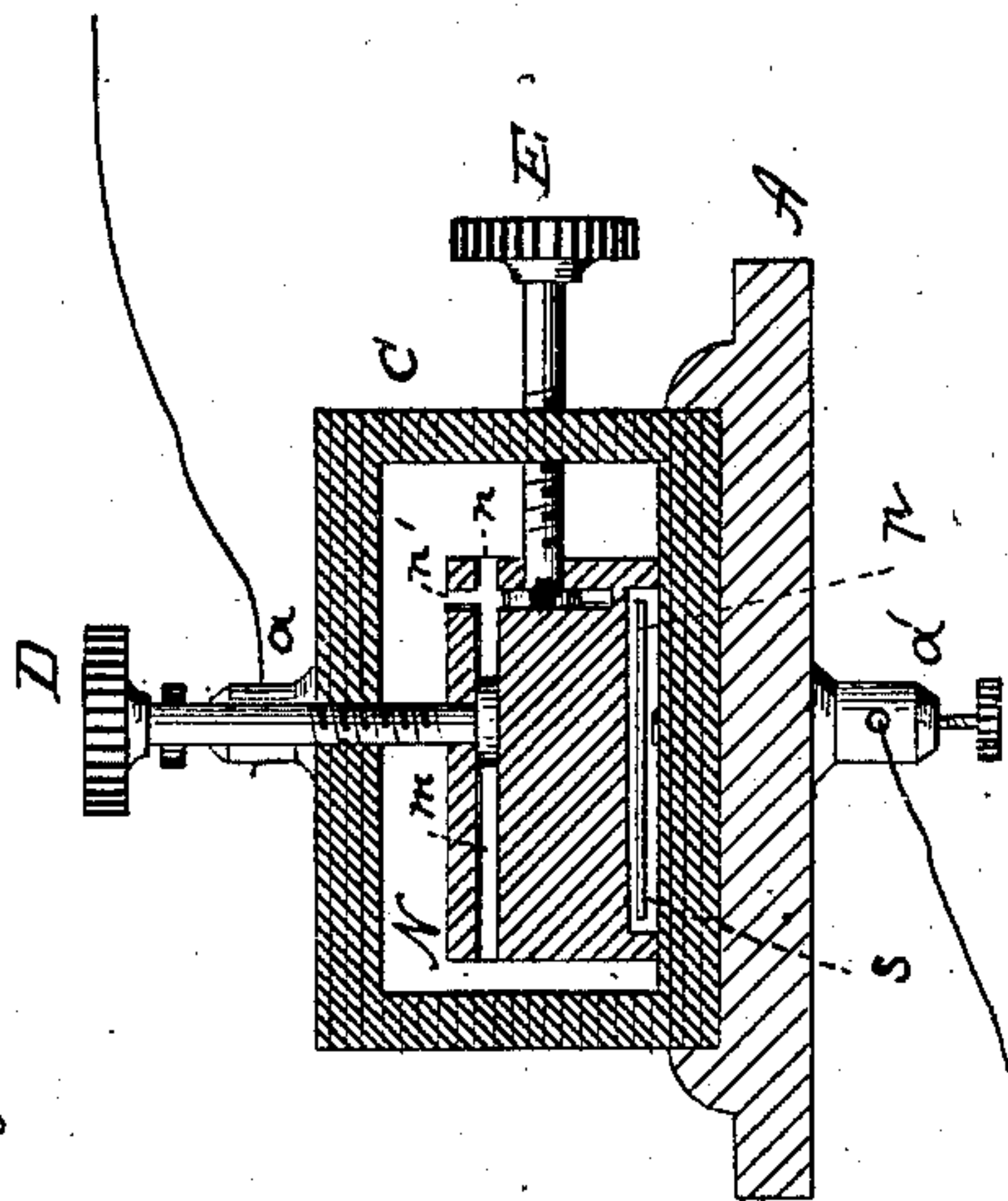


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM FITZ CHARLES MASON McCARTY, OF MOSCOW, RUSSIA, ASSIGNOR
TO JAMES F. PIERCE, TRUSTEE, OF NEW YORK, N. Y.

MULTIPLE CIRCUIT-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 293,974, dated February 19, 1884.

Application filed November 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FITZ CHARLES MASON McCARTY, of Moscow, Russia, a citizen and native of the United States, temporarily residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Telegraph-Transmitters and Electric-Circuit Controllers; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In the utilization of electricity for many purposes it is often desirable and of great advantage to be able to control, simultaneously and automatically by a single apparatus, a number of electric circuits entirely independent of each other and connected to different sources of current, or a number of circuits which are derived from a single circuit or from a single source of current, or to control by a series or numbers of contacts a single circuit.

The object of my invention is to furnish a telegraph-transmitter and electric-circuit controller which shall readily and reliably accomplish these objects; to which end it consists in the features more particularly hereinafter set forth and claimed.

In carrying the invention into effect, any suitable insulating-base is used, as is ordinarily the custom in electrical instruments, upon which the operative parts of the instrument are mounted and supported. Upon the base is an open-ended frame, preferably square or rectangular in cross-section, upon which are secured a number of binding-posts, equal in number to the largest number of circuits it is desired to control by the apparatus, while upon the under side of the base are secured a similar number of binding-posts. From each of the first or upper set of posts a spring or spring-actuated contact-arm, properly tipped at its free end, is so supported that its free or contact end rests upon an anvil formed on the head of the corresponding one of the second or lower set of posts. From this it is evident that if from two corresponding posts proper circuit and battery connections be made, the tipped or free end of a spring and the anvil form the terminals of an electric circuit normally closed

by the contact between the spring and the anvil. This contact is so controlled that it may be broken by a perforated tape or fillet of any suitable non-conducting material, the perforations therein being arranged in the sequence or order which it is desired to give the electric impulses. For this perforated strip I prefer to use a particular parchment or cellulose paper prepared by a process of my invention, and which is exceedingly tough and strong, of good body, readily perforated by proper apparatus, and of exceedingly high insulative capacity. As the preparation of such paper will form the subject of a subsequent application, it need not be further described herein. A series of the contacts referred to is arranged upon the frame of the machine, each set of the series being properly connected in its own independent circuit, or in a circuit derived from a common circuit and source of power. If connected in the independent circuits noted, each of which may lead to a different point, and the perforated fillet or band be passed between the contacts, the same sequence of pulsations will be automatically and simultaneously transmitted over all the circuits and to all the points connected to the circuits. To control the movement of the fillet or band, two reels may be used—one at either end—mounted pivotally upon or to the base or framing of the machine. Upon one reel is wound the prepared fillet or band, either while in position or when removed from place. The free end is then carried through the apparatus and attached to the other reel, which is arranged to be rotated by any suitable motor, spring, weight, or electromagnet, and having, preferably, a regulating device (a fly, brake, or equivalent) by which its rate of speed may be controlled. This motor is also provided with a catch or trip for stopping or releasing it, which may be a simple manually-operated trigger or catch, or may be a magnetic trip to be operated from a distance, as in the case of the well-known Morse register. In order that the fillet or band may be used several times, a separate row of perforations being provided for each, great economy in the use of the material of which the band or fillet is made being thus insured, and in order to regulate the tension upon the fillet

or band and properly guide it through the apparatus, a peculiar tension and guide apparatus is made use of. Within the open-ended frame, mounted upon the base and carrying the contact springs or arms before noted, is placed a rectangular frame, open at top and bottom, and of such size as to have some considerable range of movement vertically and sidewise. The under edges of the ends are cut away slightly, so as to form guide-grooves for the fillet or band. Through the top of the frame, at each end, pass adjusting-screws whose enlarged ends take into grooves in the ends of the inner frame, so that by adjustment of the screws the pressure downward of this inner frame may be controlled, and consequently the pressure of the guide-grooved ends upon the fillet or band and the tension on the latter may be regulated. Through the sides of this open-ended frame pass a second set of adjusting-screws taking into the inner sliding frame. The manipulation of these regulates the position horizontally or sidewise of the inner frame, and consequently of the guide-grooves, so that the latter may be so placed as to cause the fillet or band to pass through with any line of perforations registering with the line of contacts.

An apparatus constructed as hereinbefore set out, and used with a properly-prepared fillet or band, is capable of many useful applications in the use of electric currents, some of which will be hereinafter noted, while others will form the subject of subsequent applications for patents.

In the drawings, Figure 1 is a side elevation; Fig. 2, a top view or plan; Fig. 3, a longitudinal section through the apparatus, showing an arrangement of contact-points; Fig. 4, a cross-section on line *xx* of Fig. 1; and Fig. 5, a cross-section on line *yy* of Fig. 1, of an apparatus showing a typical embodiment of the invention.

A represents the base of the machine, suitably sustained upon a framing or support, *a''*. Upon this base is mounted the open-ended rectangular box or casing C, supporting the series of binding-posts *a a*, the lower end of each carrying and being electrically connected to the contact-arms F, normally acted on, in this instance, by springs *i i*. These arms F may themselves be of such resilience as to normally press downward, and the springs *i* be omitted. A second set or series of binding-posts, *a'*, is provided, the ends of which pass up through the base A and casing C, and form the anvils for the springs F, whose ends are provided with platinum or other suitable tips, *f*. As seen, the series of binding-posts *a* and *a'* are connected by the springs or arms F, six sets being shown, each set controlling an independent circuit, these circuits being shown by 1, 2, 3, 4, 5, and 6. These circuits may be independent circuits, each having its own source of current and leading to a separate point; or they may be derived circuits from a source of

current common to all, and thence leading to separate points, or, again uniting, leading to a common point or place of utilization of the current. The circuits between *a* and *a'* are controlled by a perforated band of fillet, *p*. This fillet or band is of any insulating material, the preferable one, however, being that hereinbefore noted. The passage of this fillet or band through the machine and between the contacts may be controlled by any suitable motor, (here typified by the clock-work *b*,) the perforated fillet being wound on the reel B, and its free end attached to reel B', rotated by the motor *b*. This motor *b* may be stopped or released by any suitable releasing device—a magnetic trip, for instance, as in the Morse register, or by a simple manually-operated trip or trigger, *o*. The motor should be provided with any suitable speed-regulator—say a brake, an adjustable fan, or an escapement—so that its speed may be regulated to suit whatever style of receiving apparatus may be used. The fillet or band may be supported at each end between guide-rollers *g*.

The fillet or band may have several lines of perforations, as shown in Fig. 2, in order to utilize it to the greatest degree, each line representing a different message or series of impulses. To determine which line of perforations shall be used, a guide-casing, N, is used with the framing C, of such size relatively to C that it may have a vertical and horizontal sidewise motion therein. This guide-casing N may be simply a parallelogram without top or bottom; or, if there be a top, transverse grooves may be made therein, one for each binding-post *a*. The bottom of the ends of N are cut away to form the guide-grooves *s*, through which the fillet *p* passes, and by which the position and tension thereof is regulated. Through the top of C pass the adjusting-screws D, having enlarged ends, which take into the grooves *n*, one in each end of N. By these screws the vertical position of N is controlled, and the pressure of N upon the fillet *p*, and consequently the tension of the latter, is regulated. Through the sides of C pass the adjusting-screws E, whose ends take into N, and by which the position, horizontally and sidewise, of N within C is controlled. It follows, then, that by manipulation of E the casing N, with its guide-grooves *s*, may be so placed as to cause *p* to be passed through the apparatus in such position as to cause either or any desired line of perforations to control the circuit-contacts between *a* and *a'*.

As thus described, it is readily seen that a message once prepared may be simultaneously transmitted over any number of circuits and to any number of points, and the same fillet may receive a number of messages, or the same message be placed thereon in a number of lines, the result being great economy in time and labor of transmission, and in the use of the material of the fillet. The reception of the messages so transmitted may be by any of

the well-known processes—chemical, mechanical, embossment, or, if the rate of transmission be properly adjusted, by the ordinary Morse register or sounder. The uses of this device are not, however, confined to telegraphic business. It may be used for many other purposes. For instance, if it be desired to rapidly intermit an electric current, the perforations may follow each other closely, and the circuits 1 2 3 4 5 6 be derived circuits, leading back to a common circuit or to independent circuits, the result being a rapidly-intermittent current in the one or in each circuit.

If desired for exceedingly rapid intermittent currents, there may be several series of contacts and corresponding series of perforations in the fillets, the members of each series being arranged in echelon, as shown at *w* in Fig. 2, which will enable the perforations to be made to succeed each other by a much smaller margin than if they were arranged in one line.

As thus constructed, this device may be used to control simultaneously a number of independent electric circuits, so as to transmit the same message to a number of points; or to control a number of derived circuits in ordinary telegraphy, forming, practically, a multiplex telegraph; or it may be used to control the current to a series of torpedoes or other explosives in warfare or mining, or for the charging of secondary or accumulating batteries or piles, or for a constantly-intermitted current, for any of the purposes or uses where intermittent currents are desired or needed; or it may be used with properly-prepared fillets or bands as a transmitter for fac-simile or Roman letter reception, and I do not confine myself to any particular use thereof.

While the base *A* and casings *C* and *N* are preferably made of insulating material, it is evident that they may be made of other materials, if such construction be used as shall

guarantee an insulation of the members of the series of contacts or binding-posts *a a'* from each other.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric-circuit controller, the combination of a series of contacts, a series of main circuits therefor, a fillet or band perforated with a series of perforations, each forming a distinct and separate message, and means for guiding any desired line of perforations over and through the series of contacts, substantially as set forth.

2. In an electric-circuit controller adapted to be controlled by a perforated paper fillet or band, the combination of the guide or interior casing, and means for adjusting said guide or casing, so that any desired line of perforations in said fillet or band may be passed through or between the contacts of the circuit-controller, substantially as set forth.

3. In an electric-circuit controller or transmitter, the combination, with a base, of a casing mounted thereon, a second or interior casing, and means of adjustment thereof relatively to the exterior casing, so that the proper or desired line of perforations may be guided over the series of contacts, substantially as set forth.

4. In an electric-circuit controller or transmitter, a series of contact-controlling devices, a guide for the perforated fillet controlling said devices, and means for adjustment of said guide, so that any desired line of perforations may be passed under the contact-controlling devices, substantially as set forth.

This specification signed and witnessed this 7th day of November, 1883.

WILLIAM FITZ CHARLES MASON McCARTY.

Witnesses:

MILO K. LIKE,

E. G. MATURIN.