

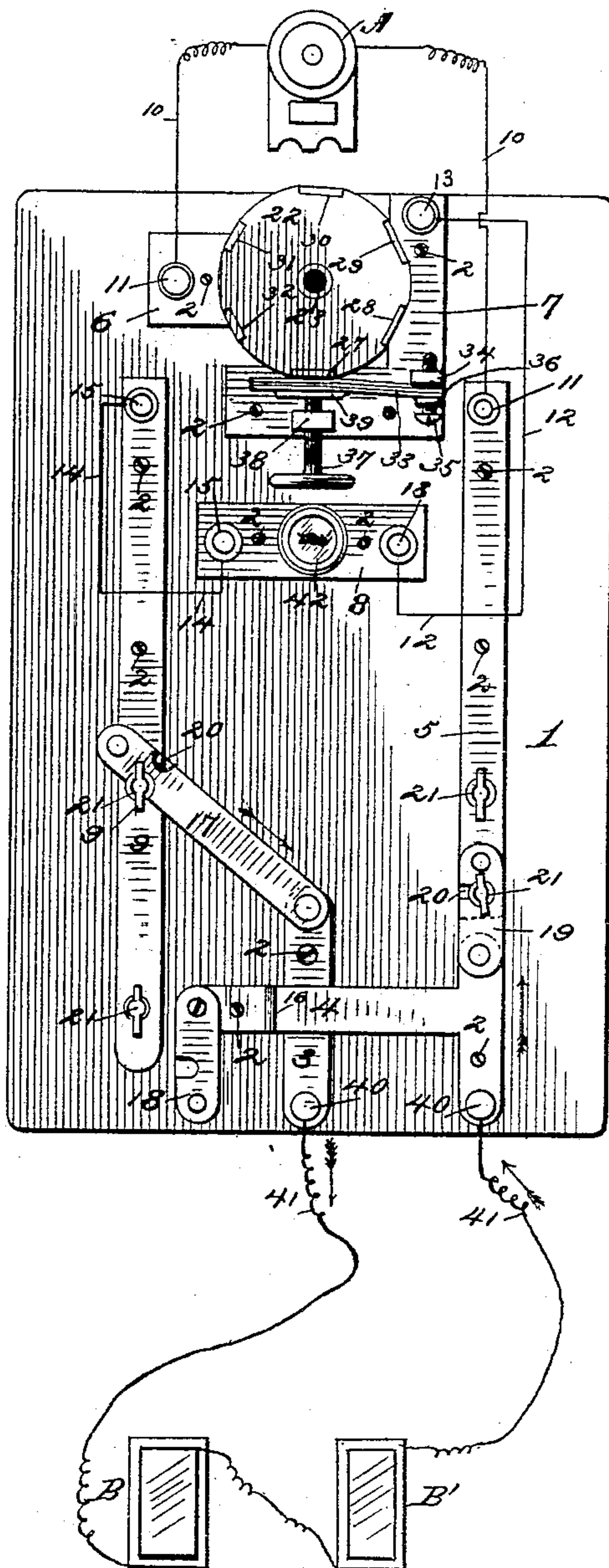
C. G. BICKLEY.

REVERSING SWITCH AND RHEOSTAT FOR ELECTRIC CIRCUITS.

No. 389,356.

Patented Sept. 11, 1888.

Fig. 1.



WITNESSES:

W. R. Davis.
G. Sedgwick

INVENTOR:

C. G. Bickley
BY Munn & Co.
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Fig. 2.

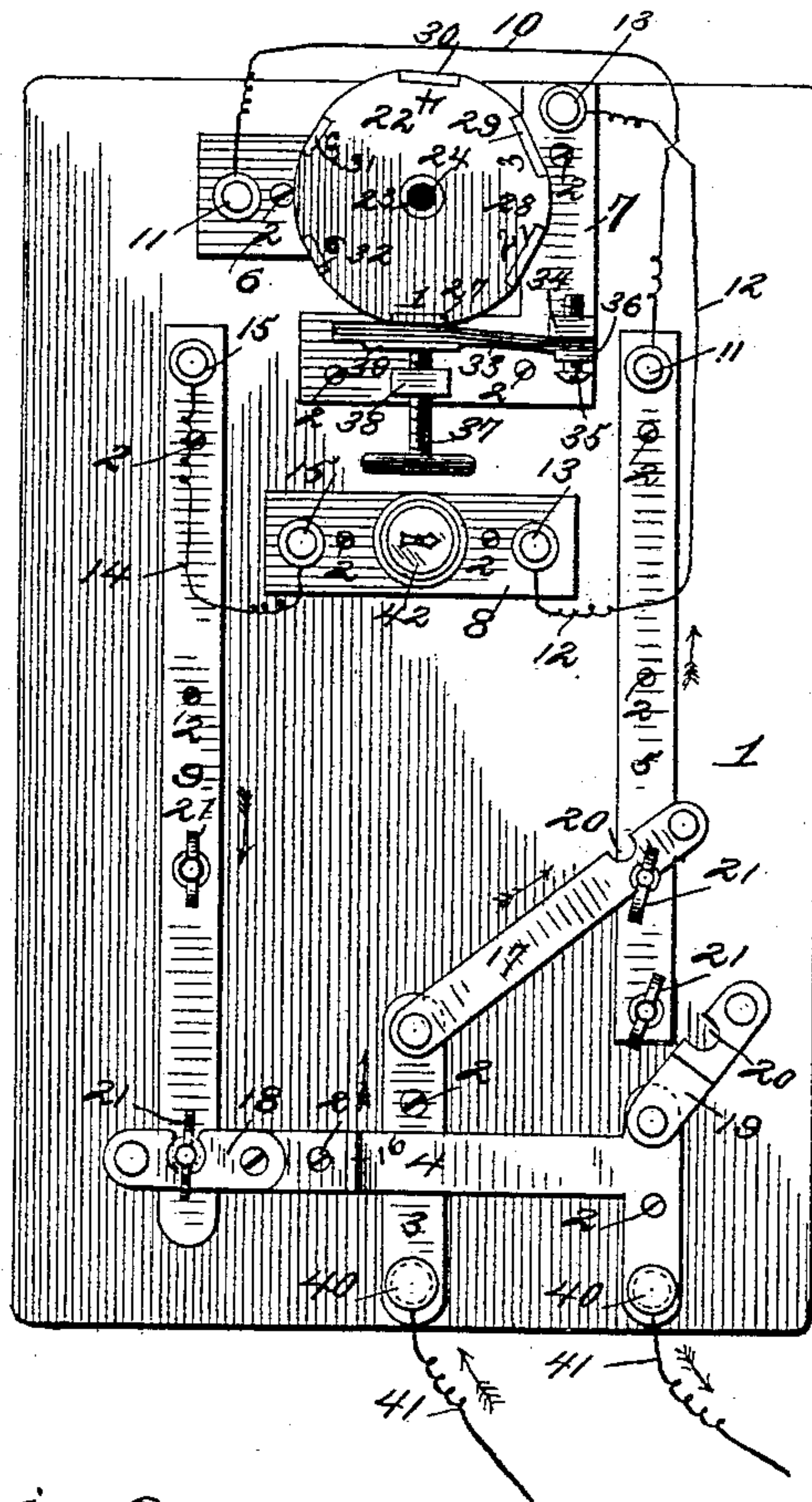
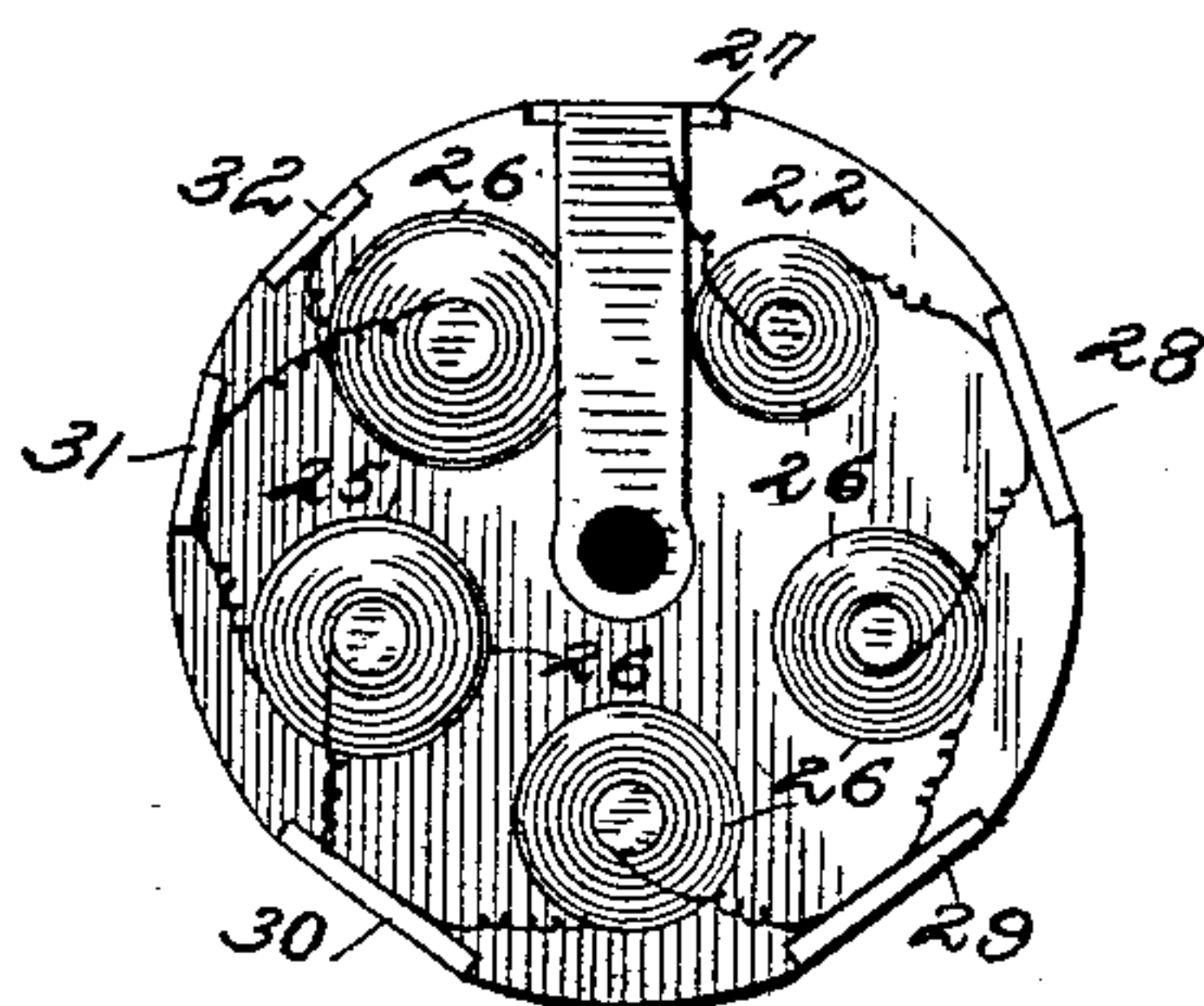


Fig. 3.



WITNESSES:

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INVENTOR:

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(No Model.)

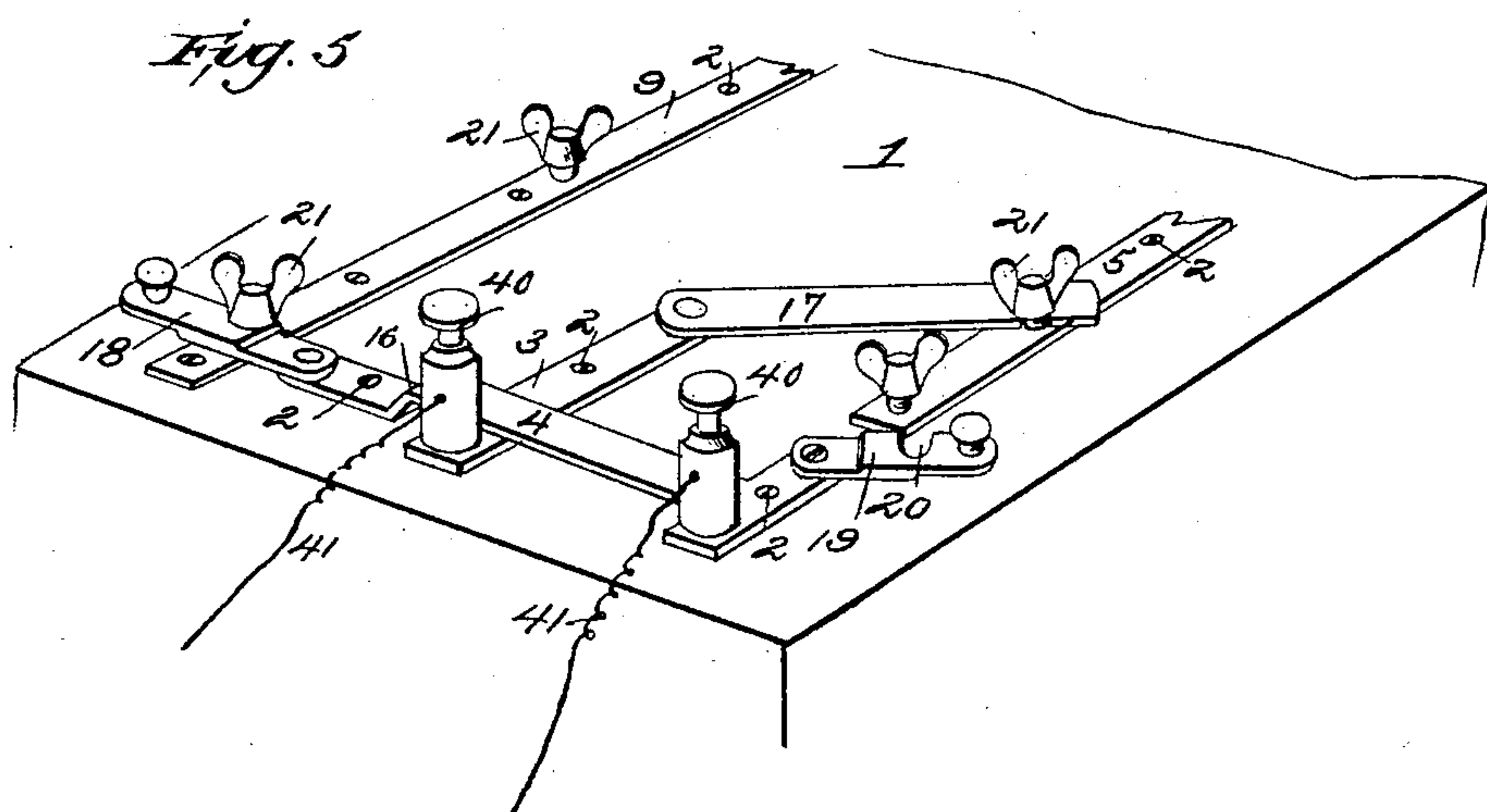
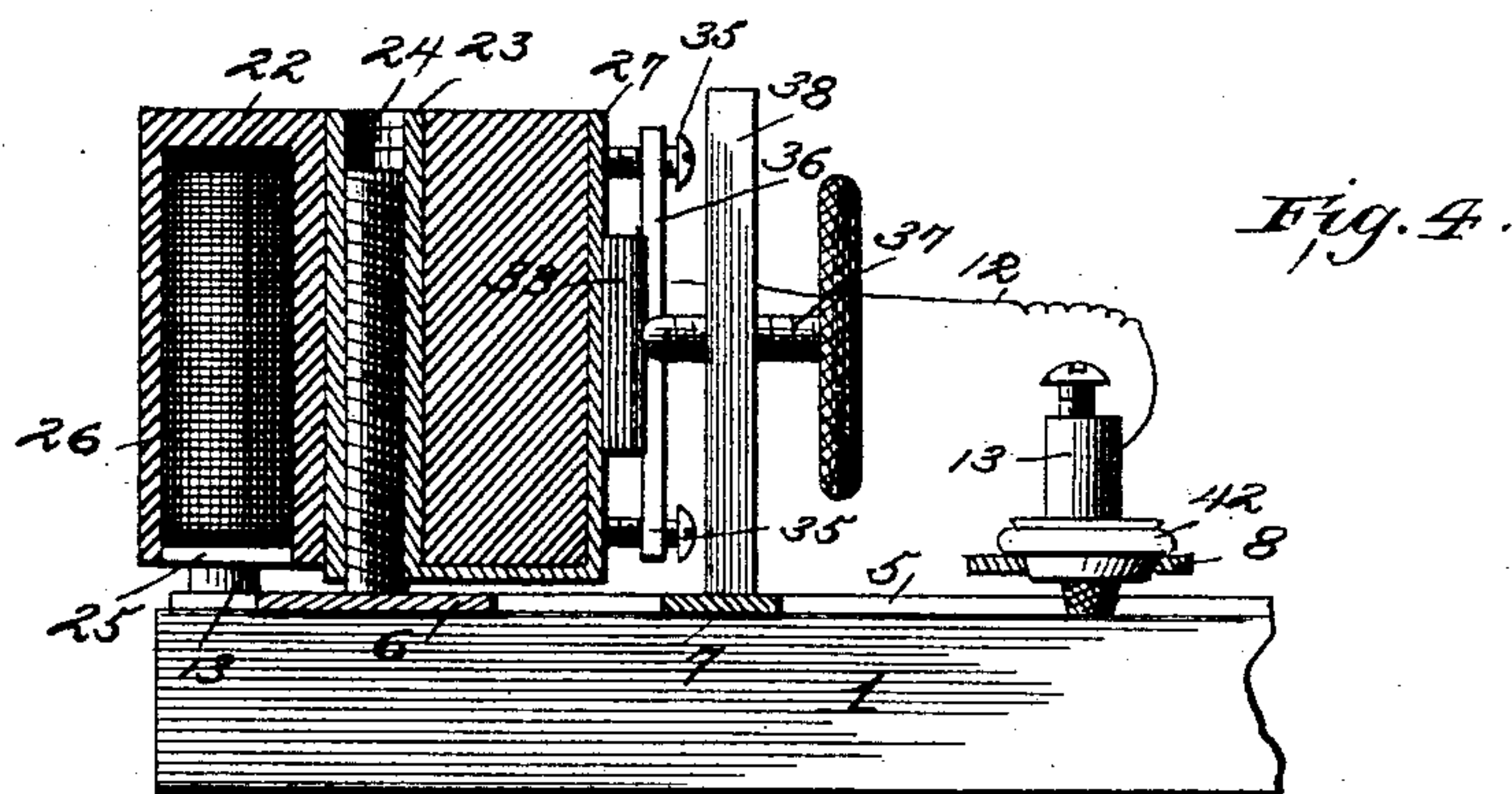
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BY

Munn Co

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UNITED STATES PATENT OFFICE.

CHARLES G. BICKLEY, OF NEW YORK, N. Y.

REVERSING-SWITCH AND RHEOSTAT FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 389,356, dated September 11, 1888.

Application filed October 29, 1887. Serial No. 253,703. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. BICKLEY, of the city, county, and State of New York, have invented a new and Improved Switch and Resistance-Regulator for Electric Circuits, of which the following is a full, clear, and exact description.

This invention relates to a switch and resistance-regulator employed in an electric circuit, and has especial reference to its use in connection with electroplating, in order to avoid the reversals of current resulting from the polarization of the electrodes dipping in the electrolyte.

The invention consists in a three-part switch, a series of adjustable resistance coils or bobbins, a contact-maker, and in details located in an electric circuit, all constructed and arranged as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the device with the switch in normal position and showing it connected to the dynamo and electroplating-baths. Fig. 2 is a similar view with the switch changed. Fig. 3 is a detail plan view of the resistance-regulator. Fig. 4 is a side view of the resistance-regulator, partly in vertical section, with its base broken away; and Fig. 5 is a perspective view of the switch mechanism, with parts broken away.

It is well known in electroplating that a secondary current is liable to be developed in the bath, which runs in a contrary direction and reduces the strength of the main current. It may even occur that the latter may be counterbalanced, destroyed, and reversed by polarization, which action interrupts or destroys the deposition. It is therefore important to use a sufficient electro-motive force of current and to be careful that the current always travels in the same direction.

In view of the foregoing I have constructed a device as follows: Upon a suitable base or switch board, 1, are secured by screws 2 metallic strips or plates 3 4 5 6 7 8 9. From the binding-posts 11 of the plates 5 and 6 extend the wires 10, which lead to the dynamo A. The plates 7 and 8 are connected by wire 12

and binding-posts 13, and the plates 8 and 9 by wire 14 and binding-posts 15. The strip 4 is insulated from strip 3 by being bent, as at 16, and extending above it. The strip or plate 3 has pivoted thereto a switch-arm, 17, and the plate 4 switch-arms 18 19, the switch-arms being notched, as at 20, to engage binding-screws 21 on strips 5 and 9. The switch-arms 17 18 19 practically form a three-part switch adapted to be shifted to change the direction of the current. To regulate the resistance of the current, a resistance device is employed, as follows: A cylinder, 22, of non-conducting material, is mounted by means of a finely-threaded tube, 23, therein upon a screw-rod, 24, on strip or plate 6.

The cylinder 22 is formed with a number of holes or sockets, 25, in which are located coils or bobbins 26, of wire or other suitable material, of different degrees of resistance and connecting in order with metallic strips 27 28 29 30 31 32, let into the face of the cylinder 22 and extending from top to bottom. The strip 27 connects with tube 23 and extends across the bottom of the cylinder and up the side, as shown. Adjacent to cylinder 22 is located a contact-maker consisting of a number of metallic leaves or strips, 33, secured at one end to a post, 34, on plate 7 by means of screws and a clamping-plate, 36. The strips 33 are pressed against the adjacent plate of the several plates or strips 27 28, &c., on cylinder 22 by means of an adjusting-screw, 37, in a post, 38, on plate 7. The end of the adjusting-screw bears against a plate, 39, soldered to the inner strip 33. It will be seen that by rotating the cylinder 22, so as to bring one of the strips 27 28, &c., opposite to the contact-maker, and by adjusting the pressure of strips 33 by means of screw 37, the resistance in the electrical circuit may be regulated. By means of the strips 27 28, &c., and the leaves or strips 33, a broad contact-surface is afforded, and by the adjustment of screw 37 and variable pressure of strips 33 the degree of resistance is regulated in addition to the coils 26. The construction of the parts is such that they may be easily kept clean. The size of the strips 27 28, &c., and the strips 33 depends upon the amount of contact-surface desired.

While a rotary cylinder has been described

to bring one of a number of coils or bobbins of different degrees of resistance into position adjacent to a contact-maker, any other suitable means might be employed to produce the same result. The cylinder 22 may be rotated in any suitable way. Upon the plates 3 4 are located binding-posts 40, having secured therein wires 41, which are connected to the bath or baths B B', the baths being connected as shown when more than one is employed. It will be seen from the drawings and description that an electric circuit may be established through the several parts. In order to detect any change in the main current, a galvanometer, 42, is located in strip 8. When the parts are in normal position, as shown in Fig. 1, the current passes from the dynamo through wire 10 to binding-post 11 of plate 6, to resistance-regulator, to contact-maker, to binding-post 13 of plate 7, through wire 12 to binding-post 13 of plate 8, to binding-post 15 of plate 8, through wire 14 to binding-post 15 of plate 9, to switch-arm 17, to plate 3, to binding-post 40 of plate 3, through wire 41 to bath, through the bath, through wire 41 to binding-post 40 of plate 4, to switch-arm 19, to plate 5, to binding-post 11 thereon, and back to the dynamo through the wire 10.

If a change in the main current arises, it will be indicated by the needle in galvanometer 42. The switch-arm 19 is then swung away from strip 5, switch-arm 17 is removed from strip 9 and connected with strip 5, and switch-arm 18 is connected with strip 9, all as shown in Fig. 2. By this means the reversal of the current is avoided and the electroplating properly continued. It will be seen by the foregoing description that the current may be readily regulated to any degree of resistance and be controlled from reversing.

I do not desire to limit myself to the specific construction of parts herein described, as they may be varied in form to accomplish the same results.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A combined reversing-switch and resist-

ance-regulator for electroplating, consisting of a main switch-arm and subsidiary switch-arms, and a series of adjustable resistance-coils of different degrees of resistance located in an electric circuit, substantially as shown and described.

2. A combined reversing-switch and resistance-regulator for electroplating, consisting of a main switch-arm and subsidiary switch-arms, and a series of adjustable resistance-coils of different degrees of resistance, and an adjustable contact-maker located in an electric circuit, substantially as described.

3. A resistance-regulator for electric currents, consisting of a rotary cylinder of non-conducting material containing a series of coils of different degrees of resistance and having contact-surfaces, and an adjustable contact-maker consisting of a number of metallic strips clamped at one end, and an adjusting-screw, substantially as described.

4. In a switch, the combination, with a switch-board and the conducting-plates 3, 5, and 9, arranged approximately parallel on the said board, of the switch-arm 17, pivoted to the plate 3 and adapted to be swung on either plate 5 or 9, the conducting-plate 4, approximately at right angles to and insulated from the plate 3, and the switch-arms 18 and 19, pivoted to the plate 4 and adapted to be swung into engagement with the plates 9 and 5, respectively, substantially as herein shown and described.

5. A resistance-regulator consisting of the screw-threaded rod 24, mounted on a suitable support, the cylinder provided with the threaded tube to receive the rod 24, and with a series of sockets, 25, the coils 26 in said sockets, contact-plates on the periphery of the cylinder, the post 34, and the strips 33, secured to said posts and resting against the contact-plates of the said cylinder, substantially as herein shown and described.

CHARLES G. BICKLEY.

Witnesses:

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