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Patented Sept. 19, 1899.

W. P. SUTTON.
ELECTROMEDICAL APPARATUS.

(Application filed Nov. 25, 1898.)

(No Model.)

2 Sheets—Sheet 1.

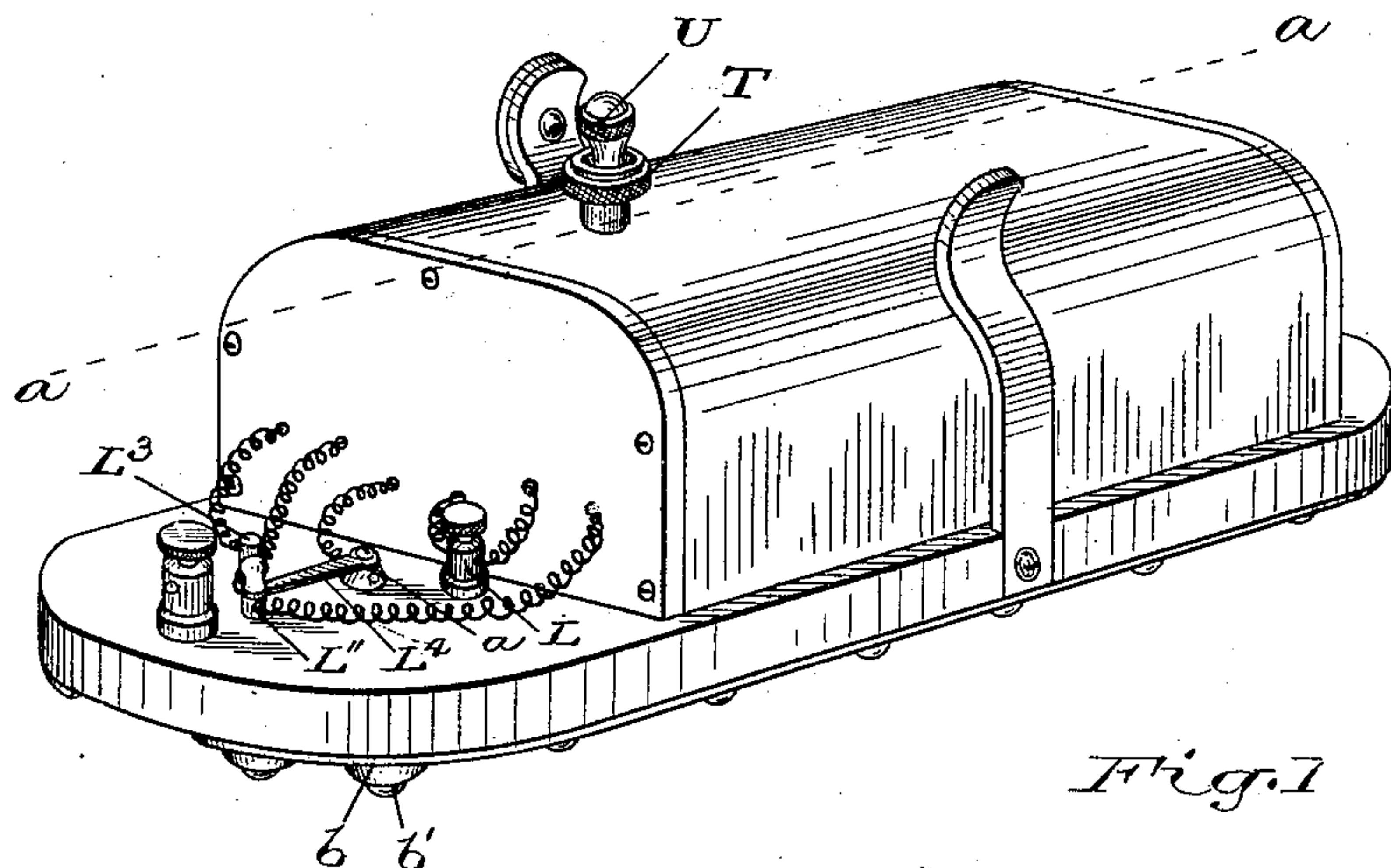


Fig. 1

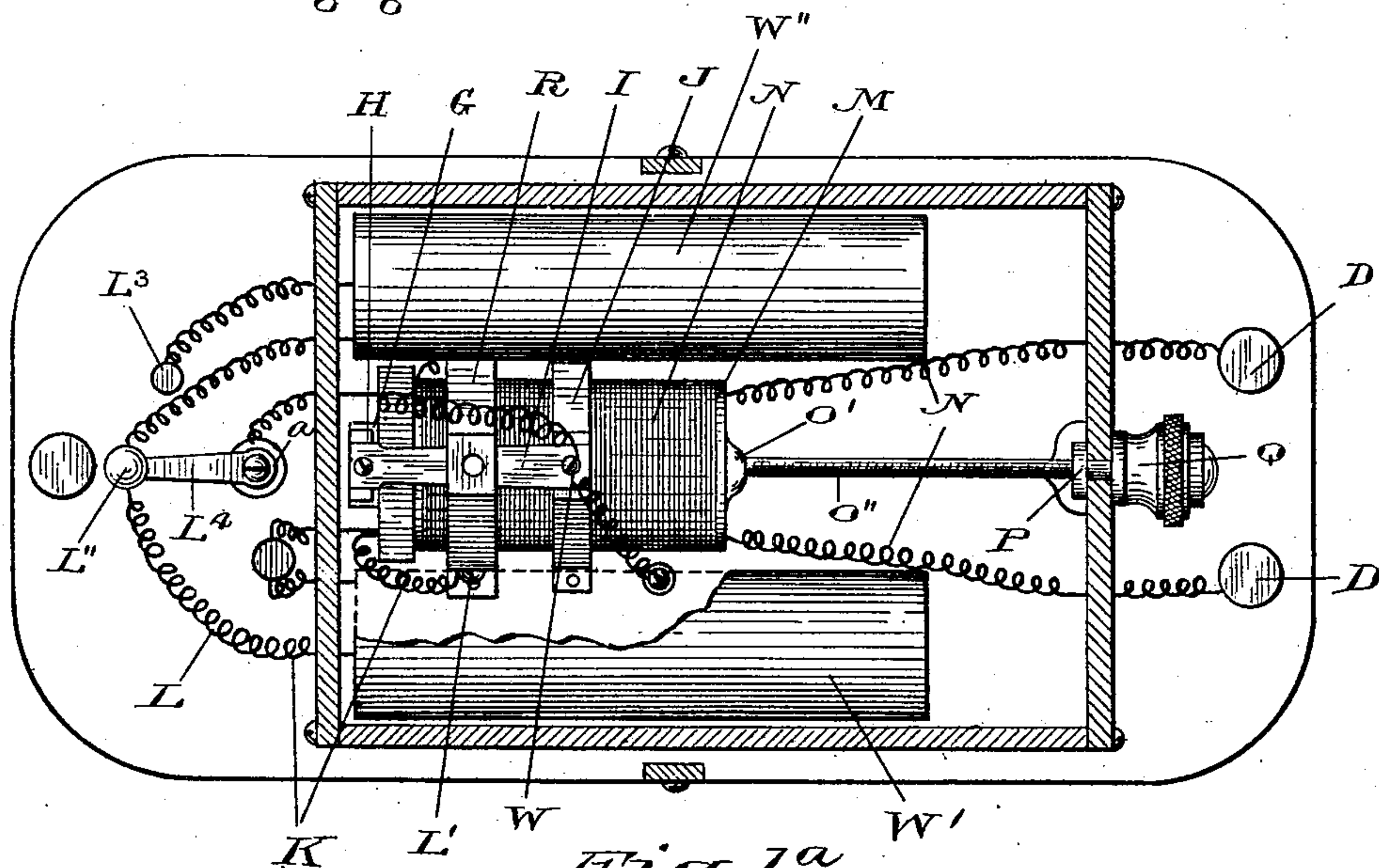


Fig. 1a

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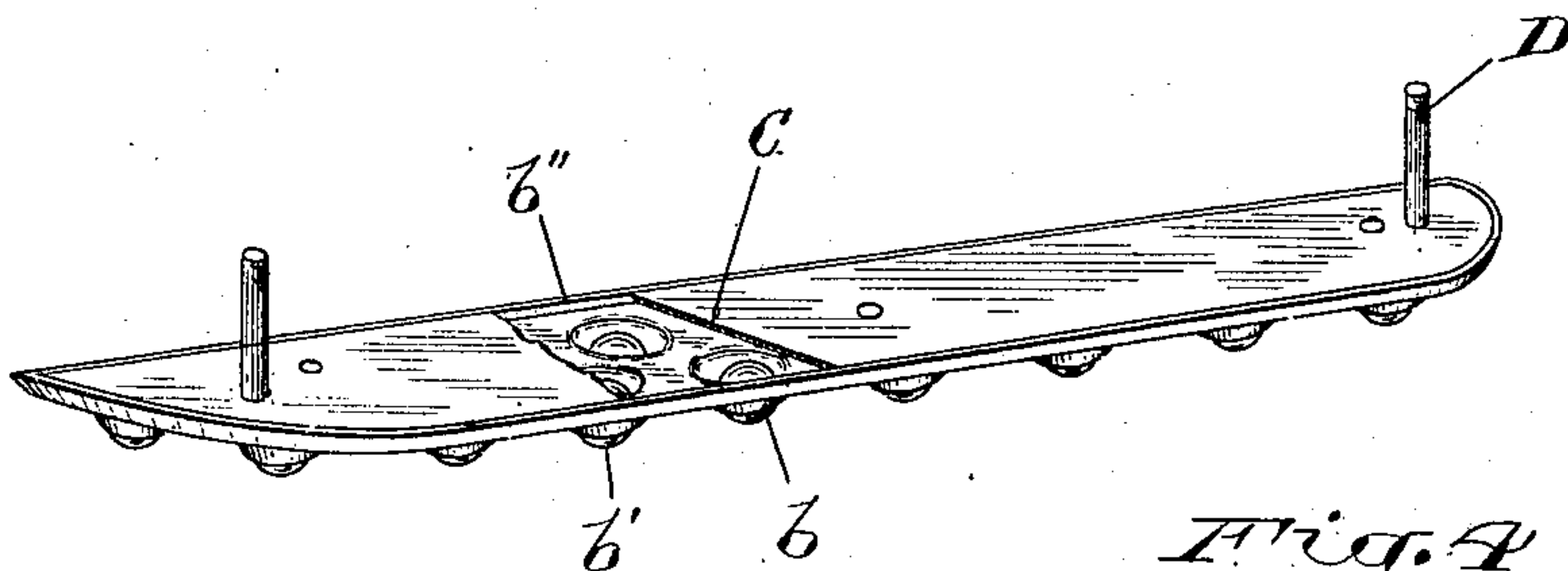
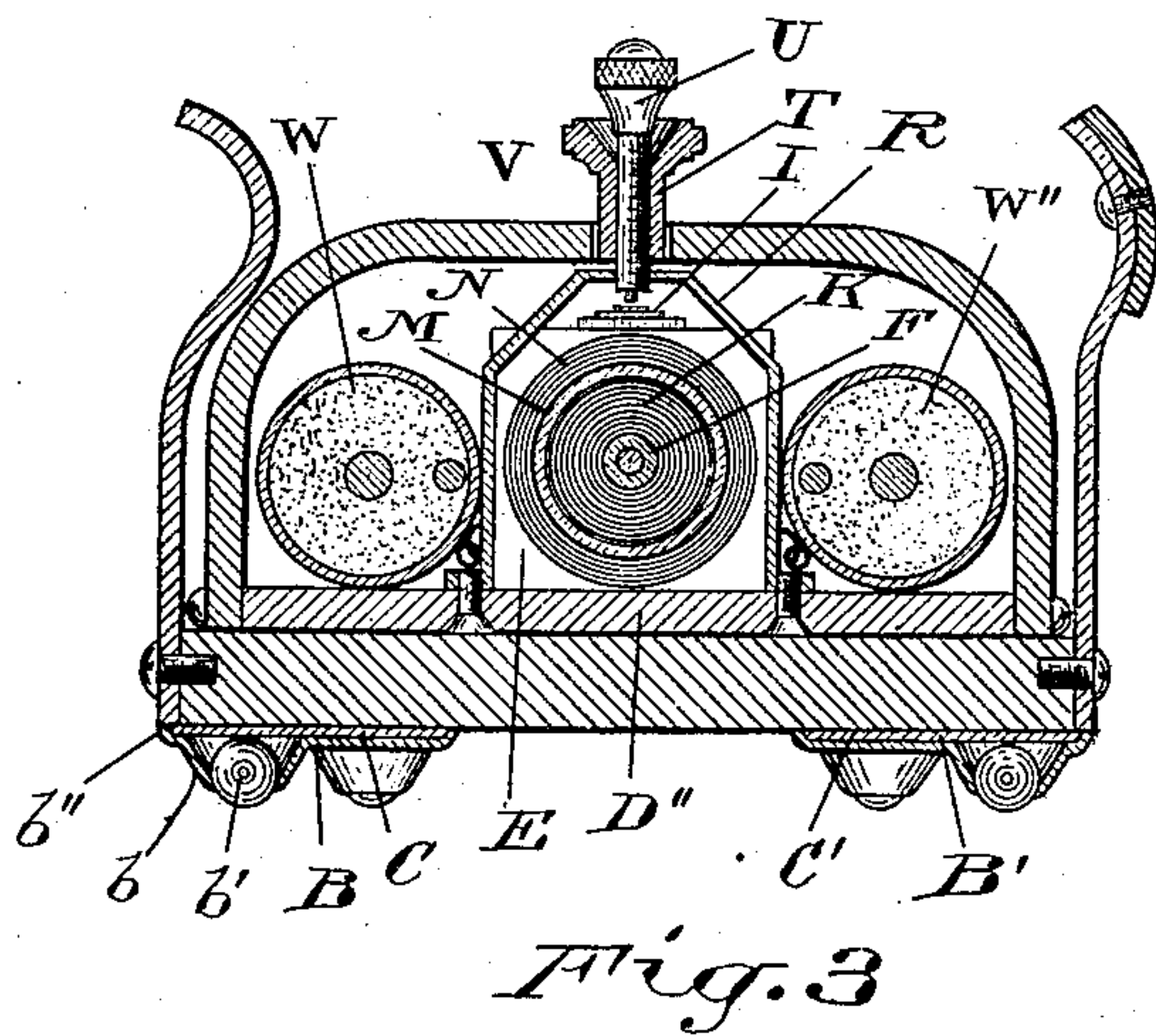
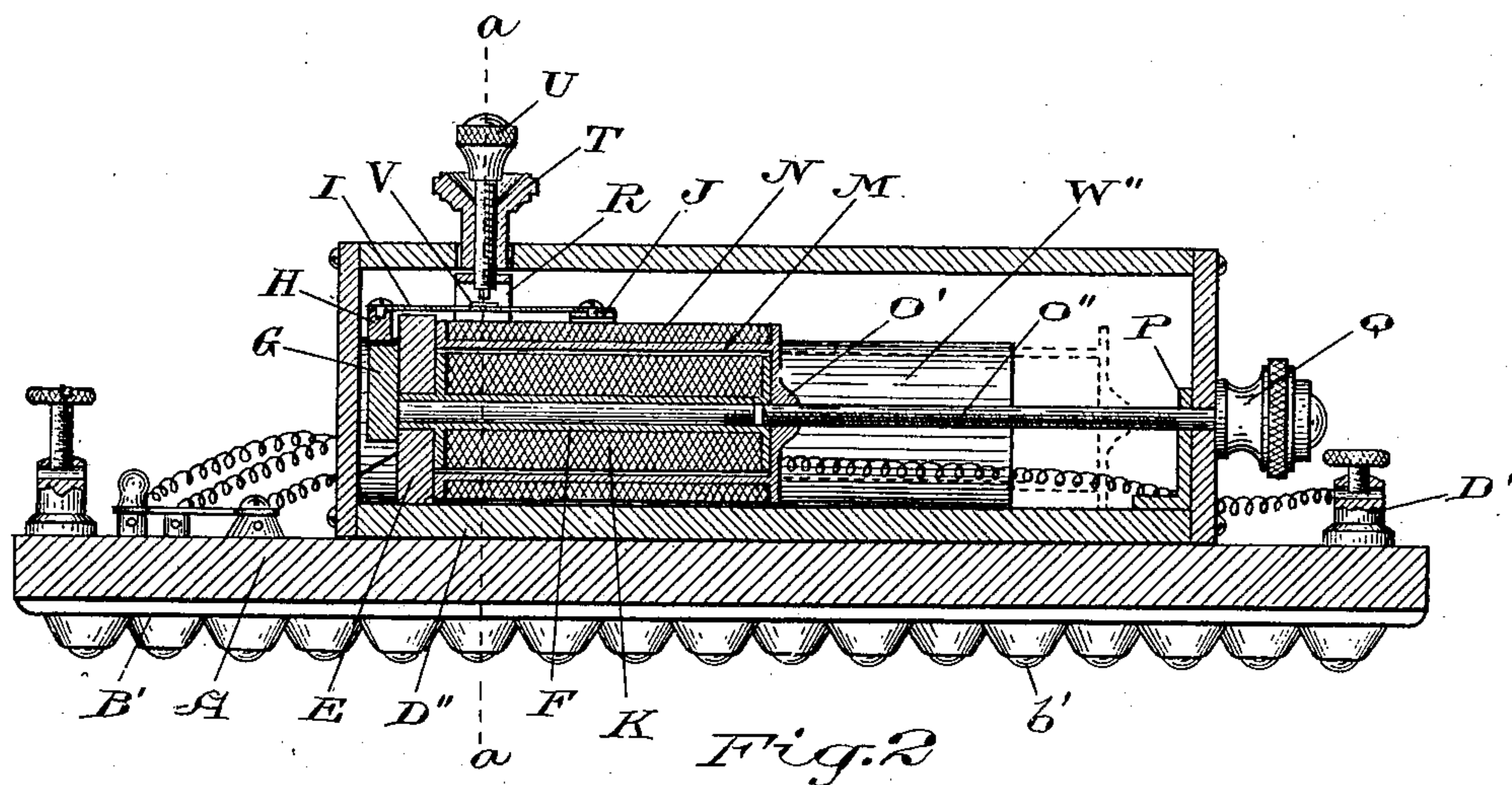
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

WILLIAM P. SUTTON, OF TORONTO, CANADA.

ELECTROMEDICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 633,223, dated September 19, 1899.

Application filed November 25, 1898. Serial No. 697,471. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. SUTTON, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented
5 certain new and useful Improvements in Electromedical Apparatus; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to an electromedical
10 apparatus by means of which a patient may be given an electromassage treatment; and the object of the invention is to so construct the apparatus that the potential of the current can be regulated to the strength of the
15 patient and to so arrange the electrodes that they will greatly reduce the frictional resistance during the treatment of the patient; and the invention consists, essentially, of the device hereinafter set forth, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of the complete apparatus. Fig. 1^a is a plan view, partly in section, of the complete apparatus. Fig. 2 is a transverse sectional
25 view on the lines *a a*, Fig. 1. Fig. 3 is a cross-sectional view on the lines *a a*, Fig. 2. Fig. 4 is a view of one of the electrodes.

Like letters of reference refer to like parts throughout the specification and drawings.

30 A represents the insulated base of the apparatus, which is made, preferably, of hard rubber or other suitable non-conducting material.

B B' represent two electrodes rigidly fastened to the under side of the base A, with
35 sufficient space between them to break the circuit of the current. Each electrode consists of a metallic plate having a plurality of cup-shaped sockets *b*. Contained in each
40 socket *b* is an antifriction-ball *b'* of conducting metal. Each socket *b* has an opening to allow of its respective ball projecting slightly beyond the metallic plate or cup-shaped socket, the purpose of which is to provide the
45 electrodes with a comparatively frictionless contact-surface. The edge of each electrode is provided with an upturned flange *b''*.

C C' represent two contact-plates, each corresponding in size and shape with the top
50 of its respective electrode and held in posi-

tion by the upturned flange *b''* of its respective plate.

D D' represent the binding-posts of the contact-plates C C', respectively. By means
55 of the contact-plates the current is distributed evenly to the antifriction-balls of each electrode.

D'' represents the base of the magnet-frame, and E represents the standard of the frame,
60 connected to the base D''.

F represents a soft-iron core supported by the standard E. The core F projects beyond the standard E, and the projecting end is fitted with an anvil or field G.

H represents the armature attached to the
65 end of an armature-spring I, connected to the bridge J, mounted upon the base D''.

K represents the primary coil wound on the core F, one end of which leads to the binding-post L and the other end of which leads to
70 the binding-post L', connected to the bridge R.

M represents a hollow core, of fiber, celluloid, or other suitable non-conducting material, inclosing the primary coil K and withdrawable therefrom. N represents a secondary
75 coil wound on the core M, the ends of which lead to the binding-posts D D' of the contact-plates C C', respectively. The outer end of the core M is provided with a cap O', to which is connected an adjusting-screw O''.
80 The shank of the adjusting-screw O'' passes through a standard P, connected to the base A, and is fitted with a swiveled thumb-nut Q, by means of which the adjusting-screw is
85 operated. By withdrawing the secondary coil from the primary coil the induced current through the secondary coil is diminished, and by replacing the secondary coil on the primary coil the induced current through the
90 secondary coil is increased.

R represents a bridge connected to the base A, embracing the magnet above the armature-spring I, and mounted on the bridge R is a lock-nut T. Passing through the lock-nut T and through the bridge R is a contact-screw U, having its point opposed to a contact-plate V on the armature-spring I. By
95 means of the lock-nut T the extent of movement of the contact-screw U can be regulated and the operator prevented from uncon- 100

sciously screwing the contact-screw against the armature-spring with sufficient force to bend it. The armature-spring I is provided with a binding-post W in circuit with the contact-plate *a* of the commutator.

W' W'' represent two batteries arranged one on each side of the magnet. The negative pole of the battery W' leads to the binding-post L, while the positive pole leads to the contact-plate L'' of the commutator. The negative pole of the battery W'' leads to the contact-plate L'' of the commutator, while the positive pole leads to the contact-plate L³.

L⁴ represents a switch pivotally connected to the contact-plate *a* and adapted to engage either of the contact-plates L'' or L³ when it is desired to shunt the current.

By means of the two batteries the potential of the current through the primary coil can be increased or diminished at will, and the operation of the invention is as follows: When the switch L⁴ normally engages the contact-plate L'', the current leads from the negative pole of the battery W' to the binding-post L, then through the primary coil to the binding-post L', to the bridge R, and from the bridge R, by means of the contact-screw U, through the armature-spring to the binding-post W, then to the contact-plate *a*, and through the switch L⁴ to the contact-plate L'', and then back to the positive pole of the battery W'. When the switch is moved to the contact-plate L³, the current leads from the contact-plate *a*, through the contact-plate L³, to the positive pole of and through the battery W''. The current during its circuit generates a current of magnetism, which causes the attraction of the armature to the anvil and breaks the current through the contact-screw and binding-post W and generates a secondary or reduce current, which passes through the secondary coil to the electrodes. The balls, as stated above, project slightly below the electrodes to form a comparatively frictionless rubbing-surface, and when these balls are in contact with the skin of the patient the current through the electrodes and secondary coil is closed. The balls by being of a conducting frictionless metal greatly reduce the frictional resistance during the use of the apparatus.

By providing the apparatus with a sliding secondary coil, as described, the potential of the current can be finely regulated to the sensibilities or strength of the patient.

Antifriction-rollers may be used instead of the antifriction-balls above described, and the electrode in this case would be altered so that the sockets would receive and retain the rollers.

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

1. An electromedical apparatus embracing in its construction an insulated base, an electrode connected to the base consisting of a

plate fitted with a series of open sockets, and conducting antifriction balls or rollers contained in the sockets and projecting slightly beyond the plate, substantially as specified.

2. An electromedical apparatus embracing in its construction an electrode, composed of a plate fitted with a series of sockets, conducting antifriction balls or rollers contained in the sockets, and a contact-plate fitted to the electrode-plate to hold the balls or rollers in position, substantially as specified.

3. An electromedical apparatus embracing in its construction an electrode composed of a plate fitted with a plurality of sockets, an upturned flange surrounding the plate, antifriction balls or rollers contained in the sockets to form the contact-surface of the electrode, and a contact-plate held in position by the upturned flange to hold the balls or rollers in their sockets, substantially as specified.

4. An electromedical apparatus embracing in its construction an insulated base, two electrodes secured to the base, each composed of a plate fitted with a series of sockets, and conducting antifriction balls or rollers contained in the sockets, substantially as specified.

5. An electromedical apparatus embracing in its construction an insulated base, two electrodes secured to the base, each composed of a plate fitted with a series of sockets, conducting antifriction balls or rollers contained in the sockets, and contact-plates interposed between the balls or rollers and insulated base, and a terminal for each contact-plate, substantially as specified.

6. An electromedical apparatus embracing in its construction an insulated base, two electrodes connected to the base, each electrode composed of a plate fitted with a series of sockets, conducting antifriction balls or rollers contained in the sockets, and an intensity-coil supported on the opposite side of the base, the terminals of which are in circuit with the electrodes, substantially as specified.

7. An electromedical apparatus embracing in its construction an insulated base, two electrodes connected to the base, each electrode composed of a plate fitted with a series of sockets, conducting antifriction balls or rollers contained in the sockets, a contact-plate fitted to each electrode-plate to hold the balls or rollers in position, terminals for the contact-plate, an intensity-coil supported on the opposite side of the base the terminals of which are in circuit with the terminals of the contact-plates, substantially as specified.

8. An electromedical apparatus embracing in its construction an insulated base, two electrodes secured to one side of the base, each electrode composed of a plate provided with a plurality of sockets, conducting antifriction balls or rollers contained in the sockets, an upturned flange for each electrode-plate, a contact-plate for each electrode interposed between the balls or rollers and the base, held in position by the upturned flanges, a termi-

5 nal for each contact-plate, a magnet secured
 to the opposite side of the base consisting of
 a soft-iron core, an anvil connected to one
 end of the soft-iron core, a primary coil wound
 10 on the soft-iron core, a removable insulated
 core inclosing the primary coil, a secondary
 coil wound on the insulated core, the termi-
 nals of the secondary coil in circuit with the
 terminals of the contact-plates, a bridge em-
 15 bracing the magnet an armature-spring con-
 nected to the magnet-frame, an armature car-
 ried by the spring opposed to the anvil, a
 contact-screw passing through the bridge op-
 posed to the armature-spring, a lock-nut to
 regulate the adjustment of the contact-screw,

a binding-post connected to the base in cir-
 cuit with one of the terminals of the primary
 coil, the other terminal of the primary coil in
 circuit with a binding-post connected to the
 bridge, a binding-post connected to the ar- 20
 mature-spring in circuit with the ground or
 one of the poles of the battery, an adjusting-
 screw to adjust the secondary coil on the pri-
 mary coil, and a thumb-nut on the adjusting-
 screw, substantially as specified.

Toronto, Canada, October 7, A. D. 1898.

W. P. SUTTON.

In presence of—

C. H. RICHES,

M. A. WESTWOOD.