

C. J. MARIUS.
ELECTRIC ROLLER.

(Application filed Feb. 6, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

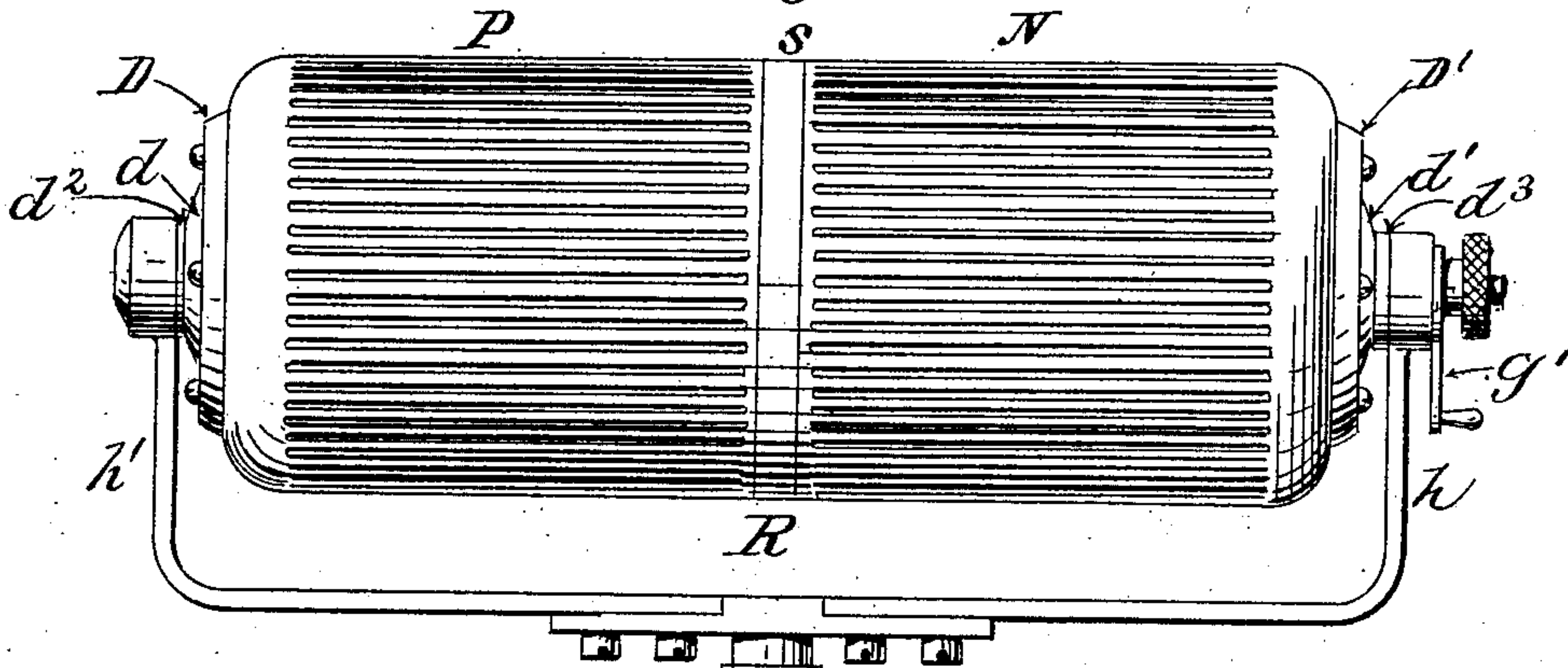


Fig. 2.

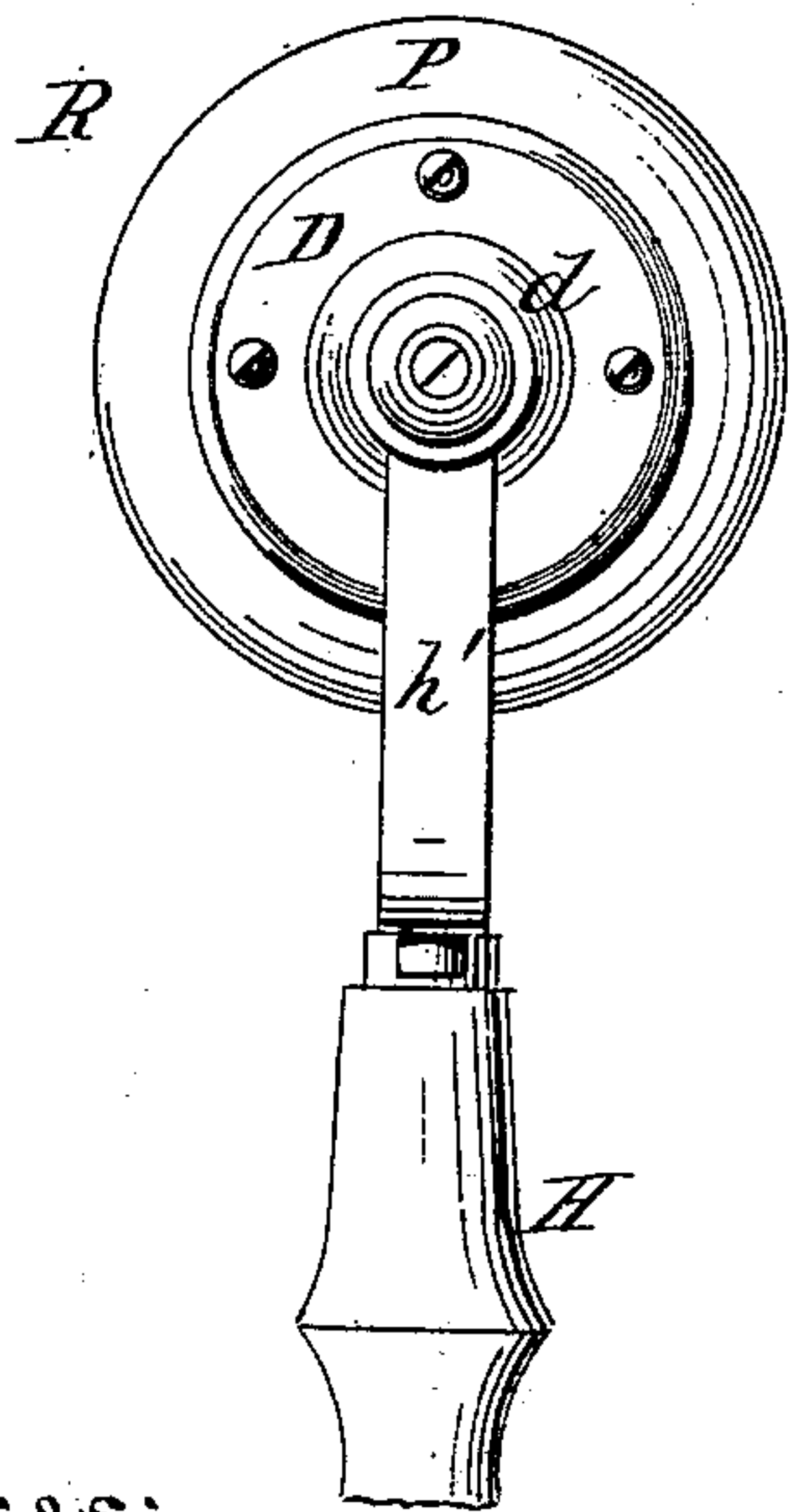
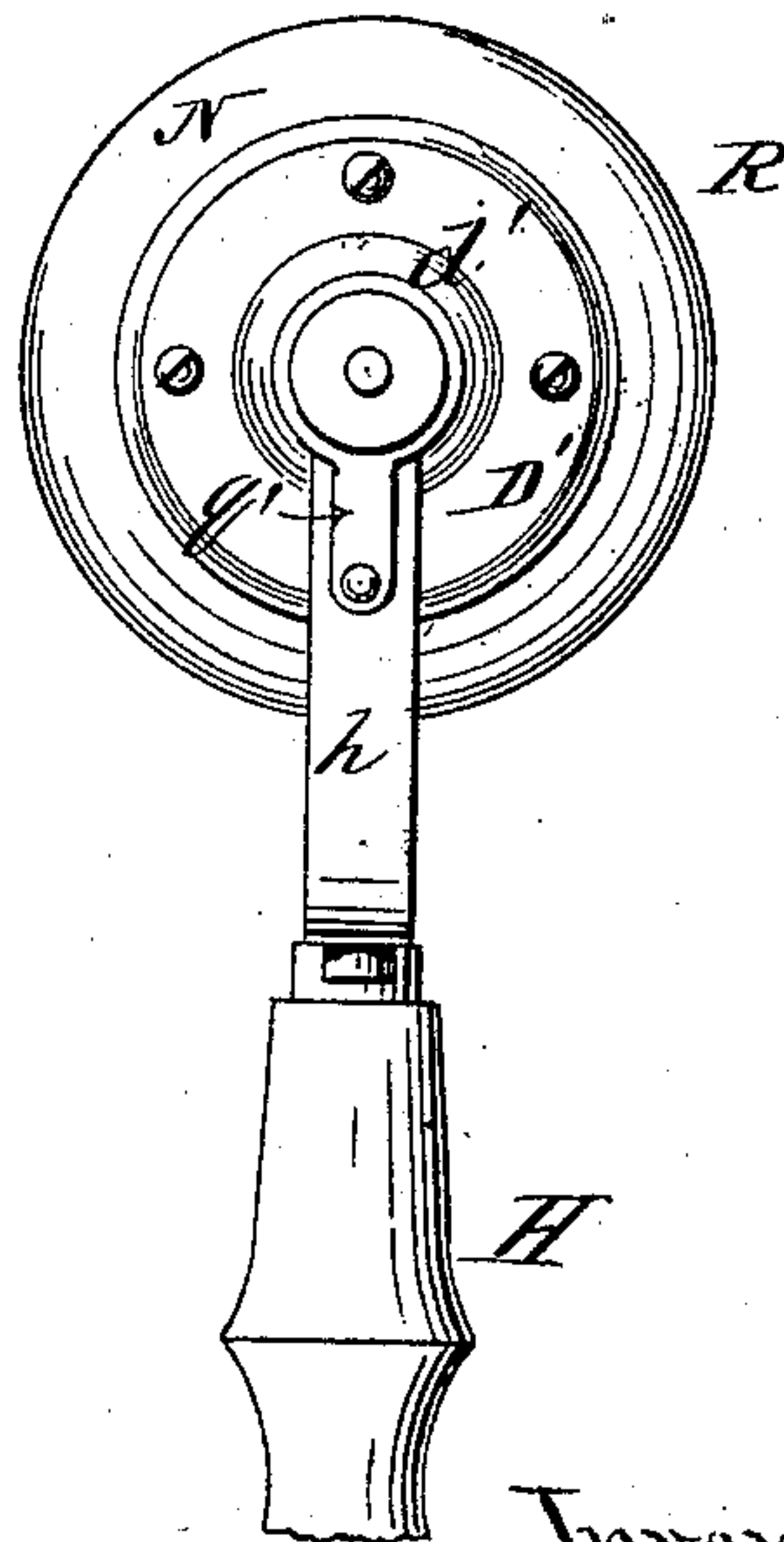


Fig. 3.



Witnesses:
O. W. Gardner.
Louis H. Rowley

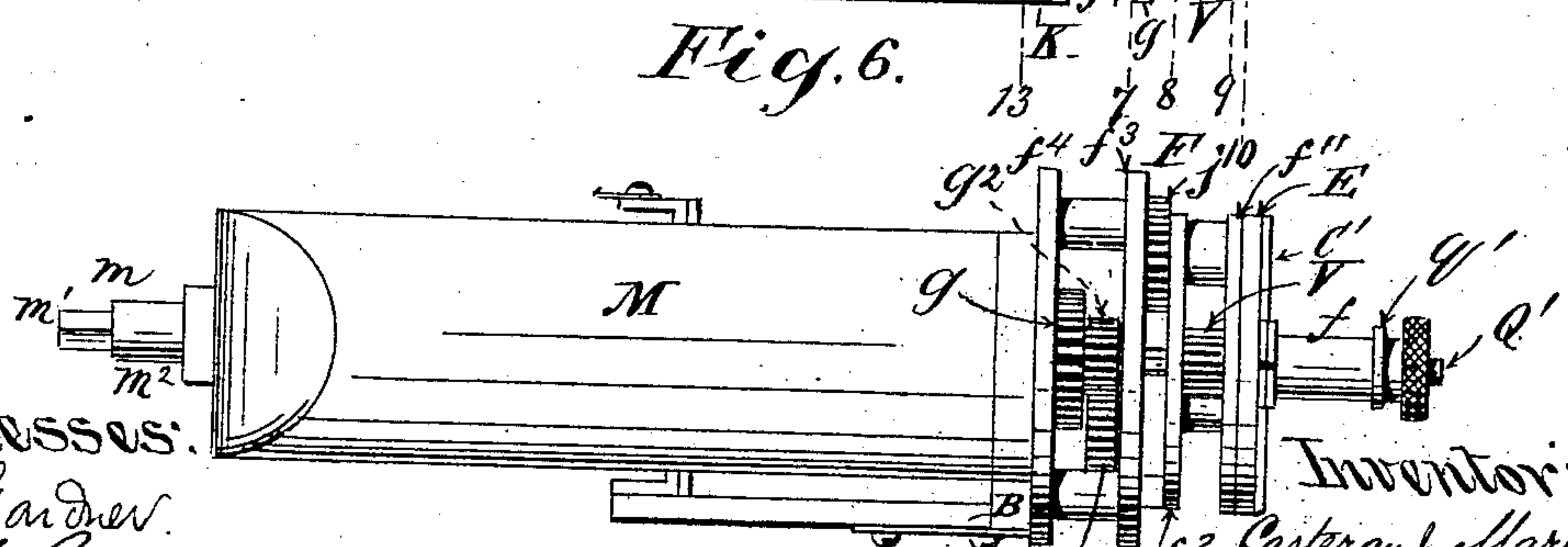
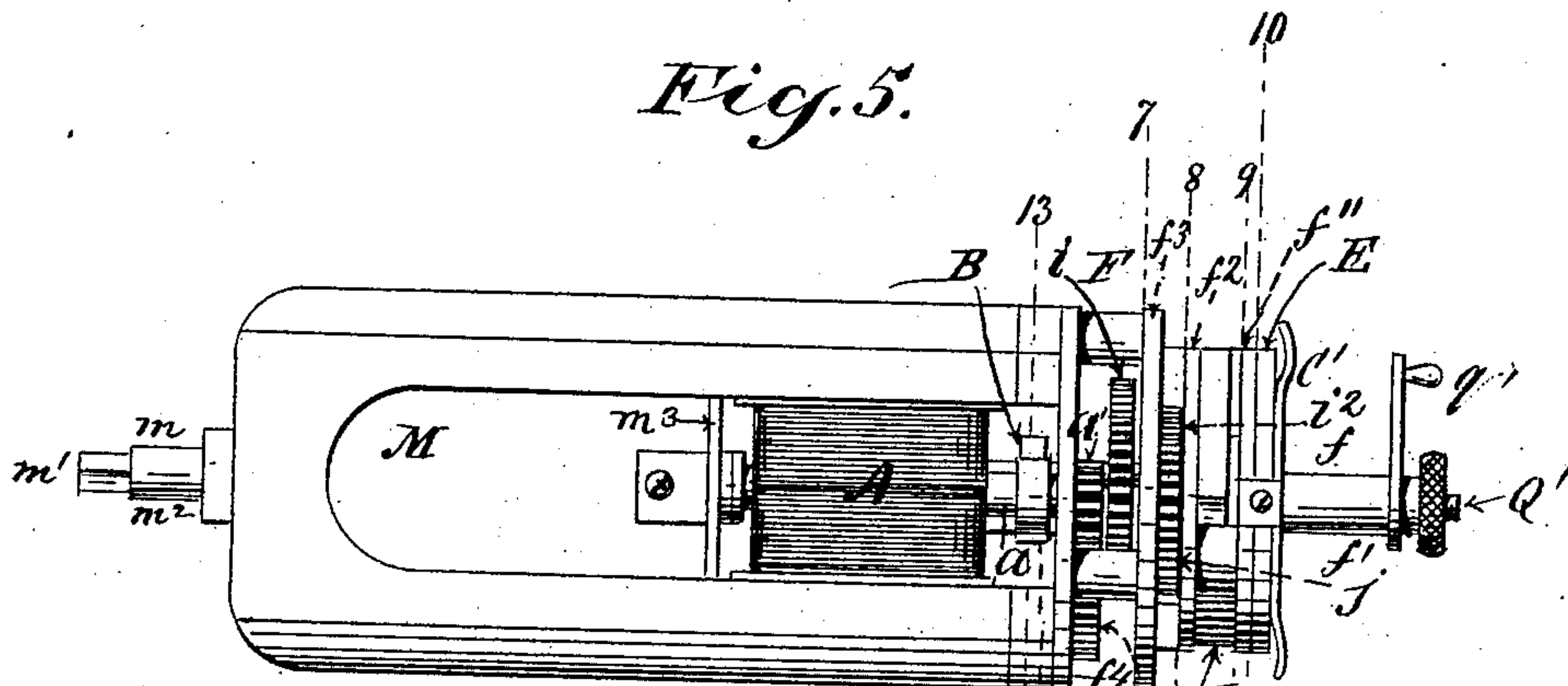
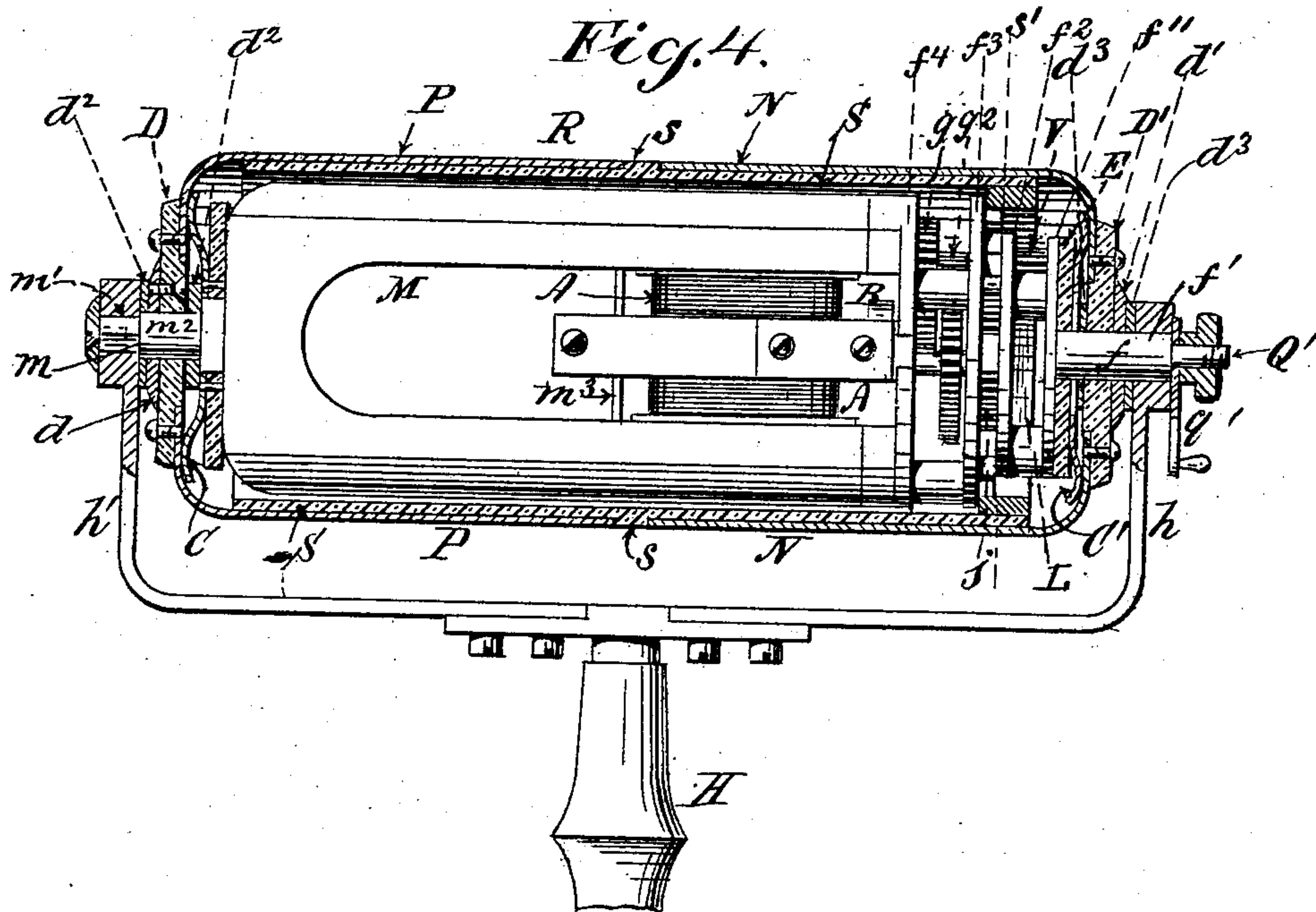
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4 Sheets—Sheet 2.



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4 Sheets—Sheet 3.

Fig. 7.

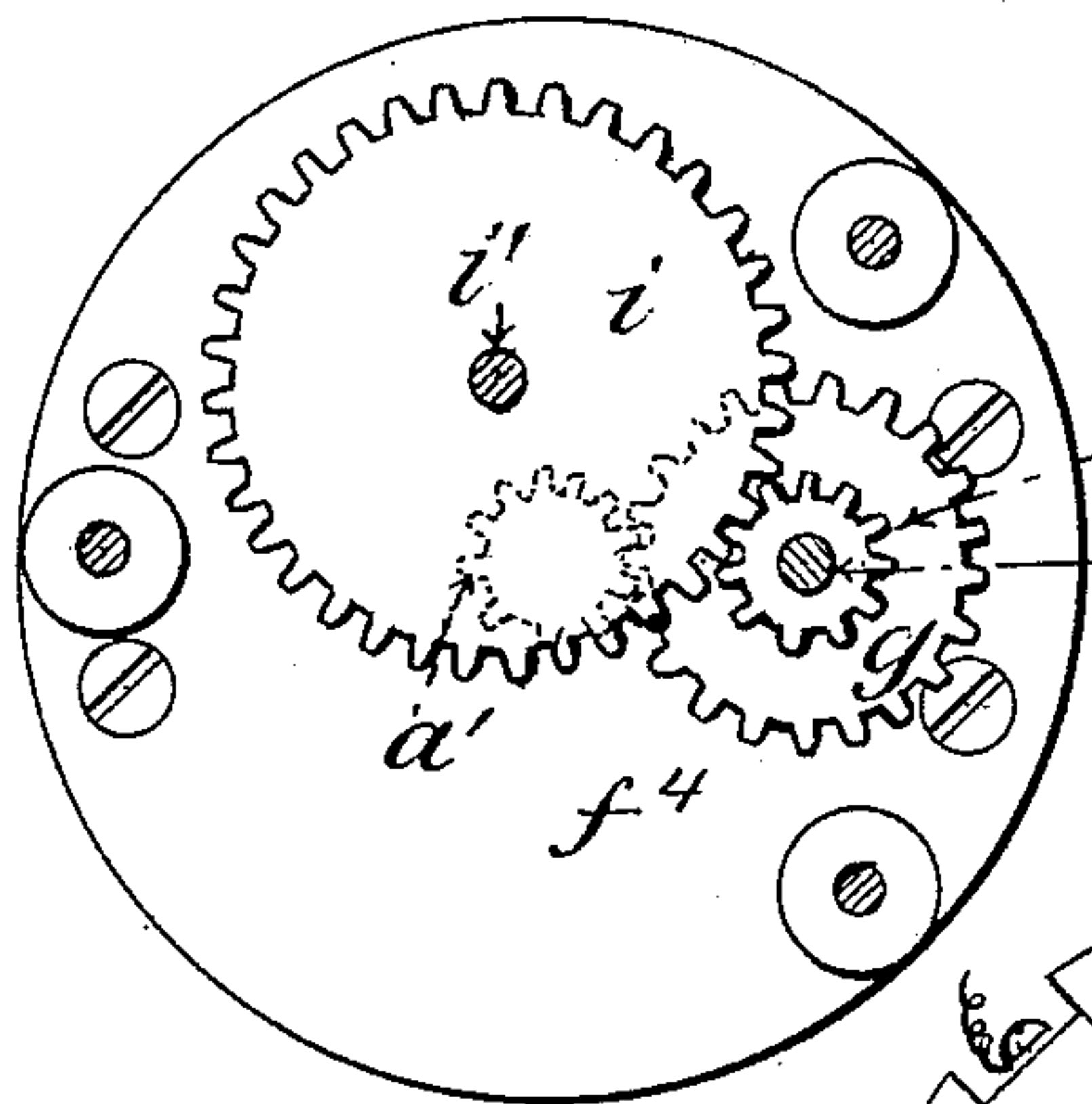


Fig. 8.

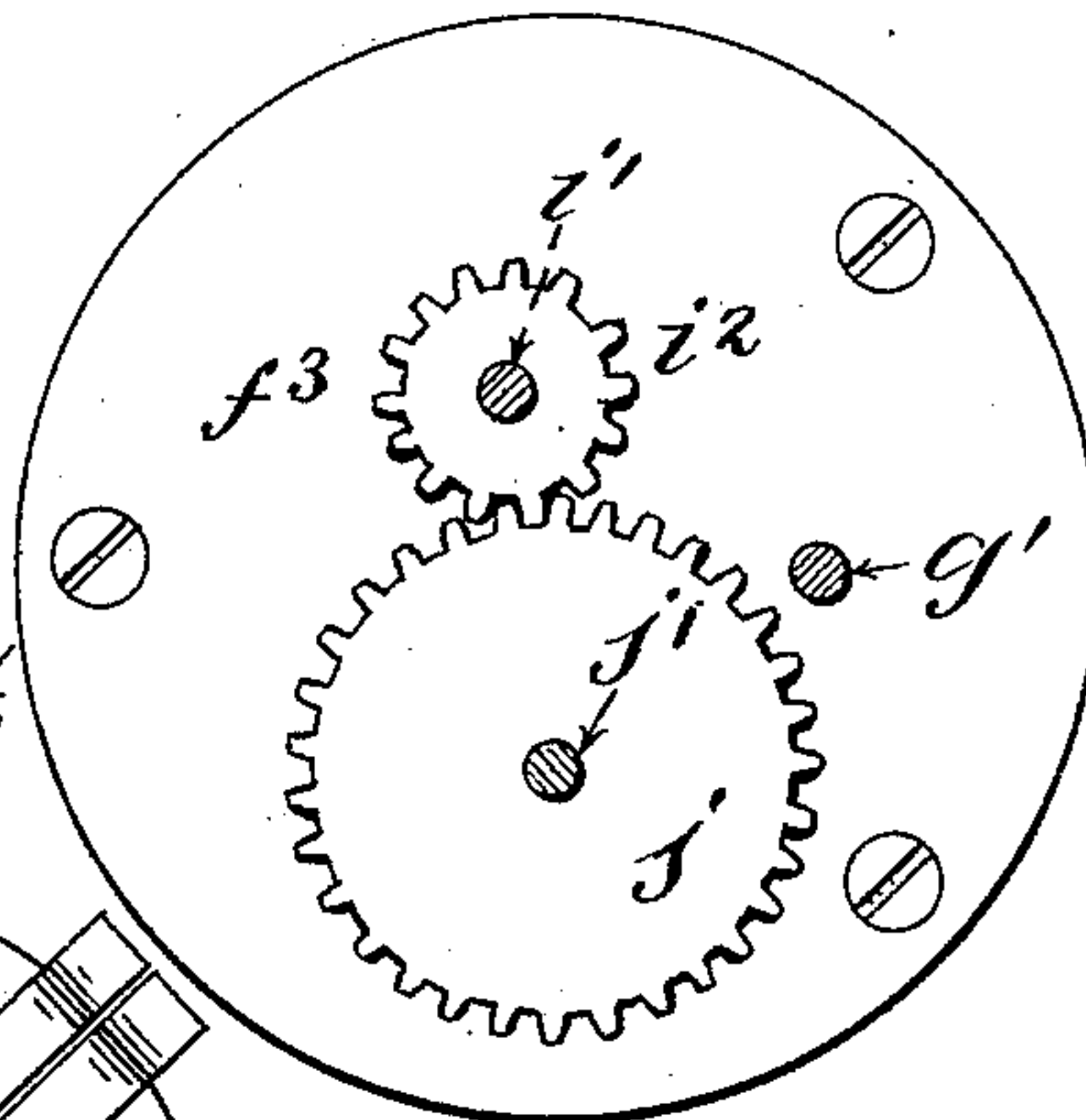


Fig. 14.

Fig. 9.

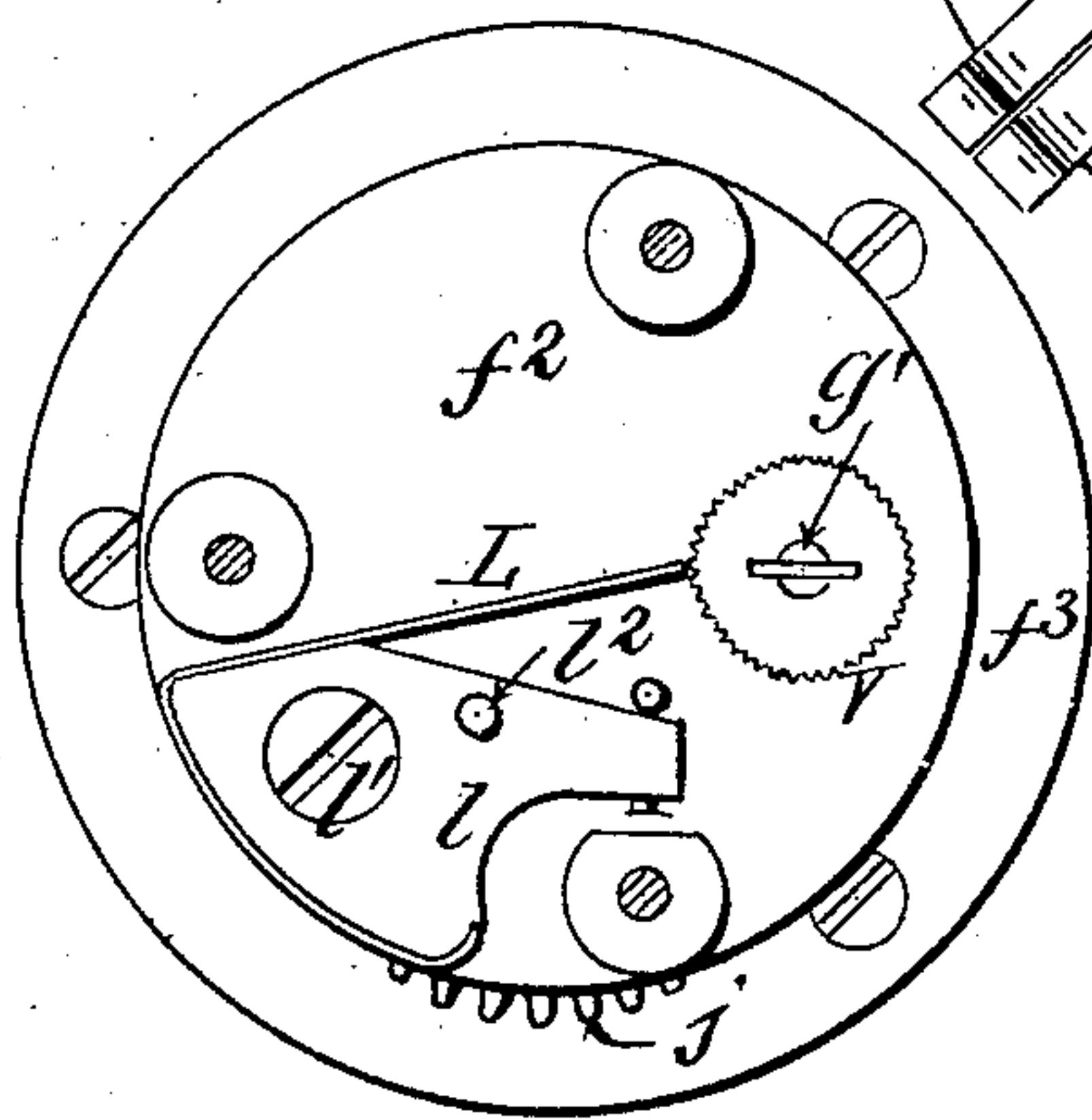


Fig. 10.

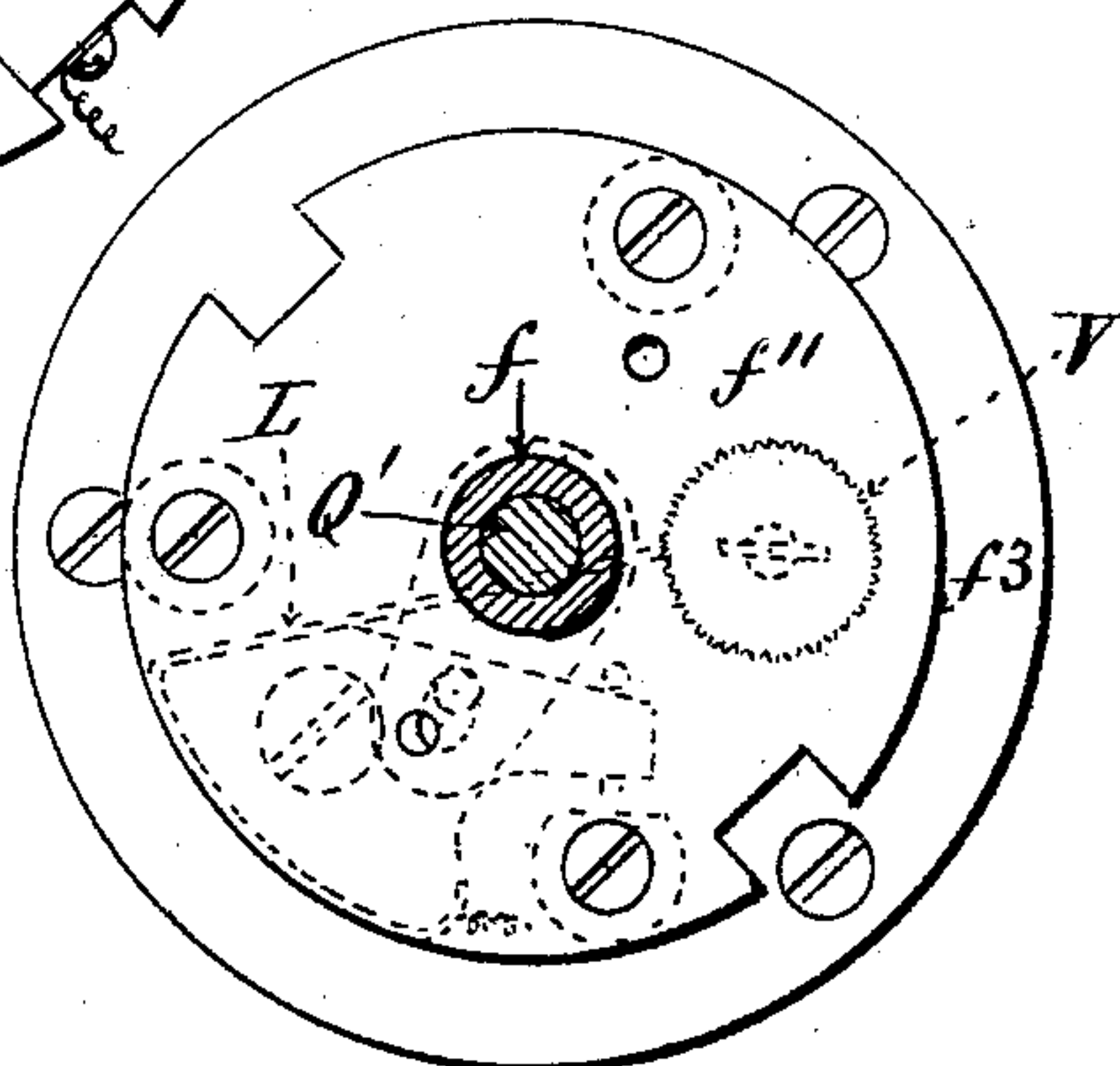


Fig. 11.

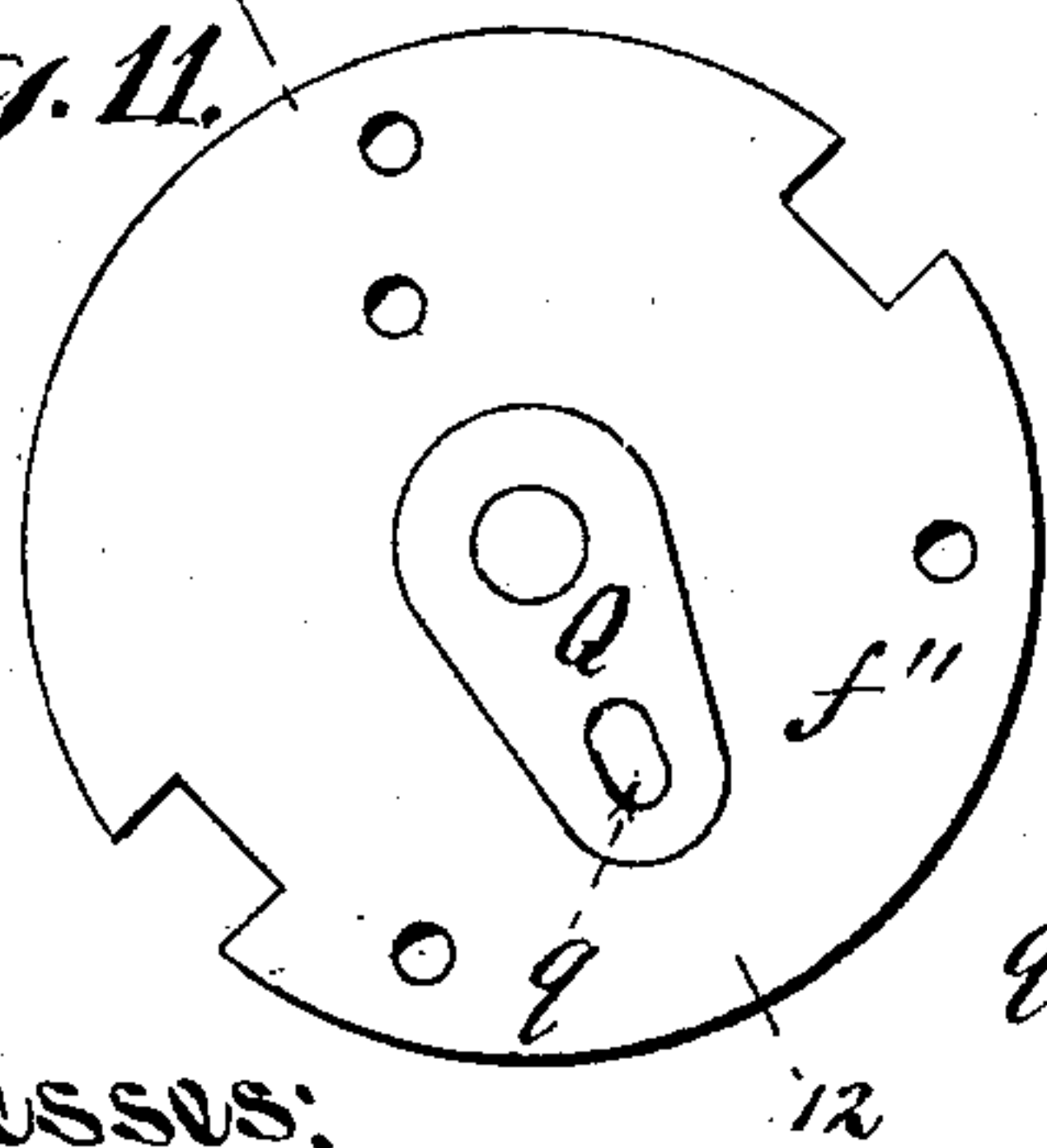


Fig. 12.

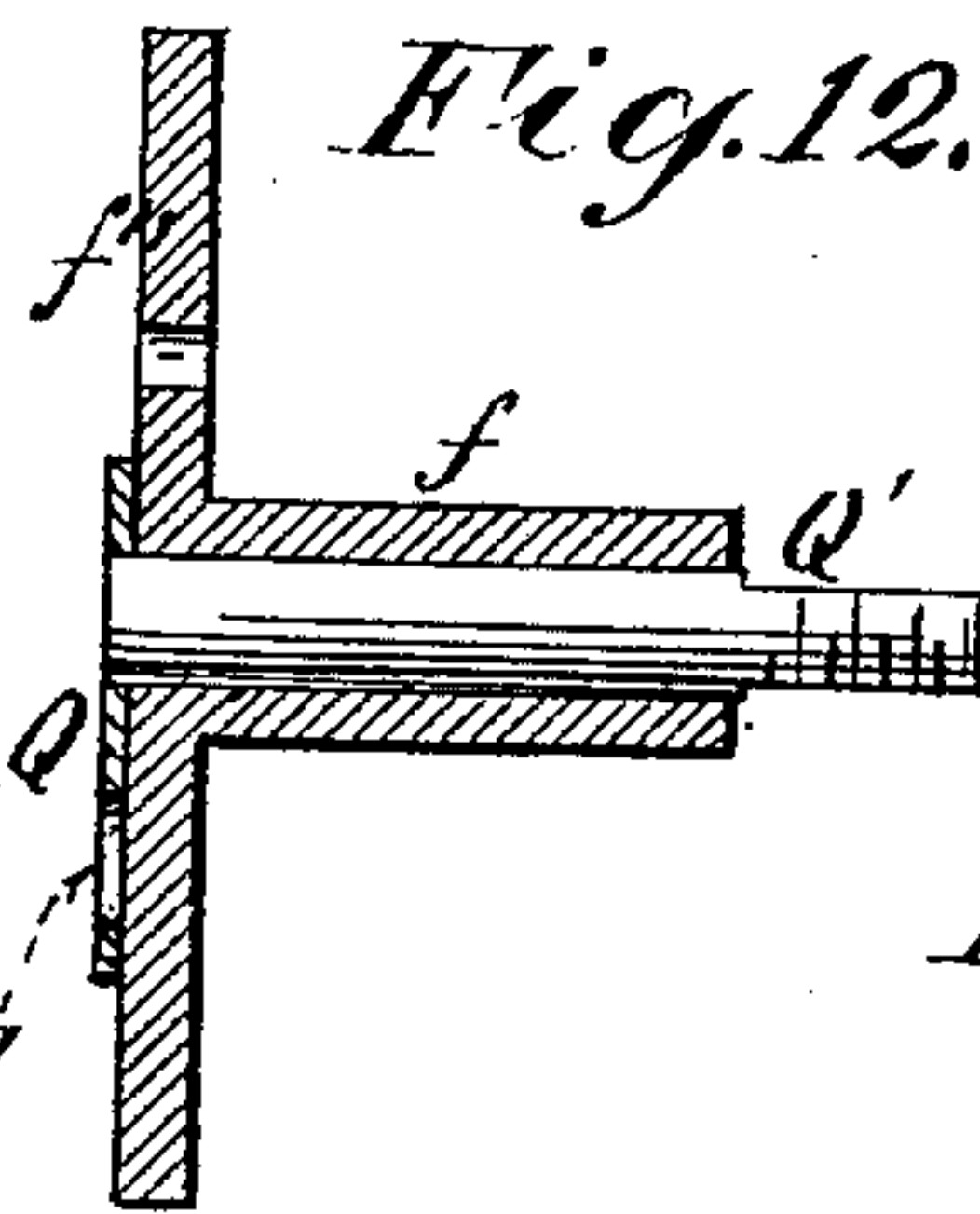
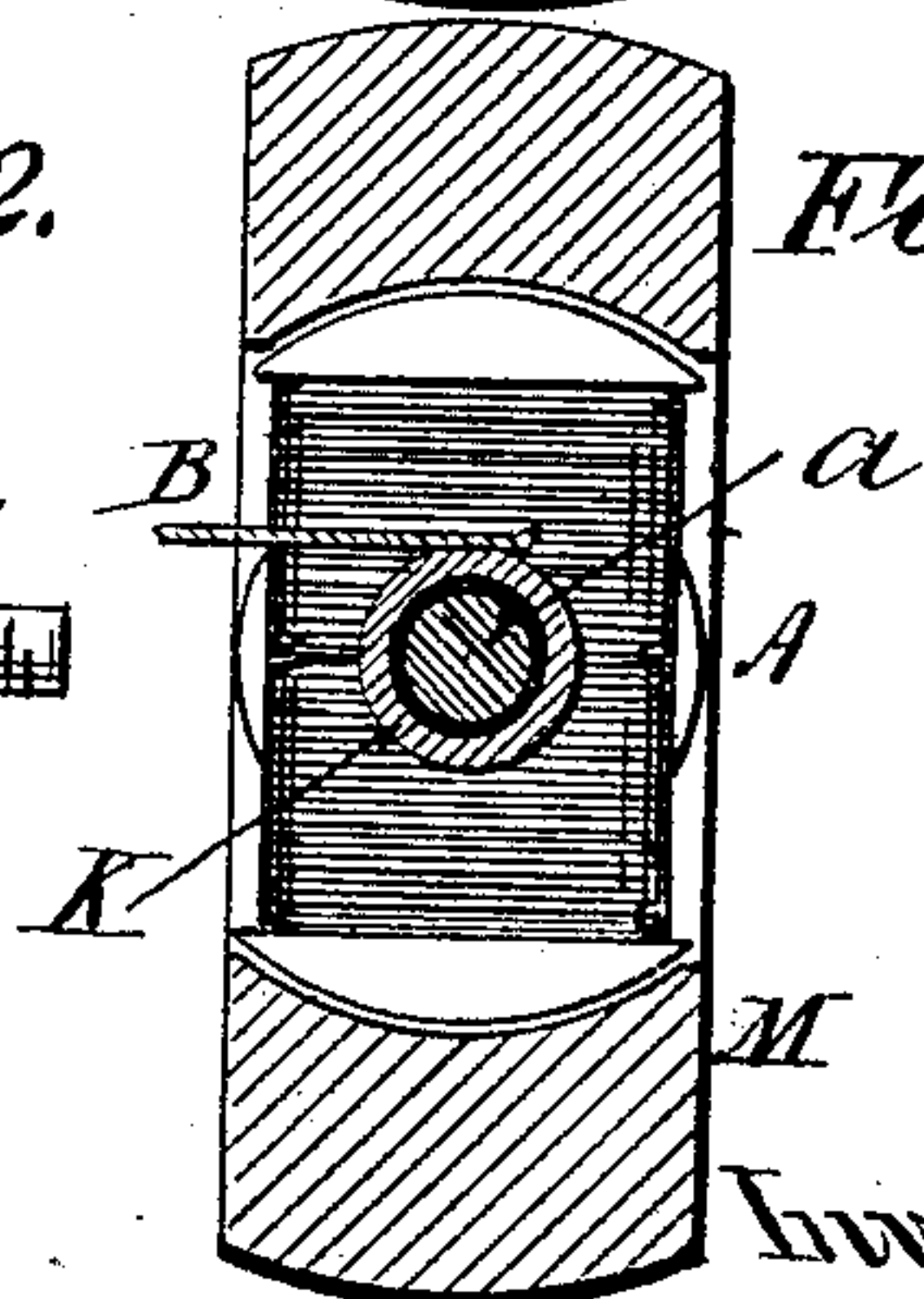


Fig. 13.



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4 Sheets—Sheet 4.

Fig. 16.

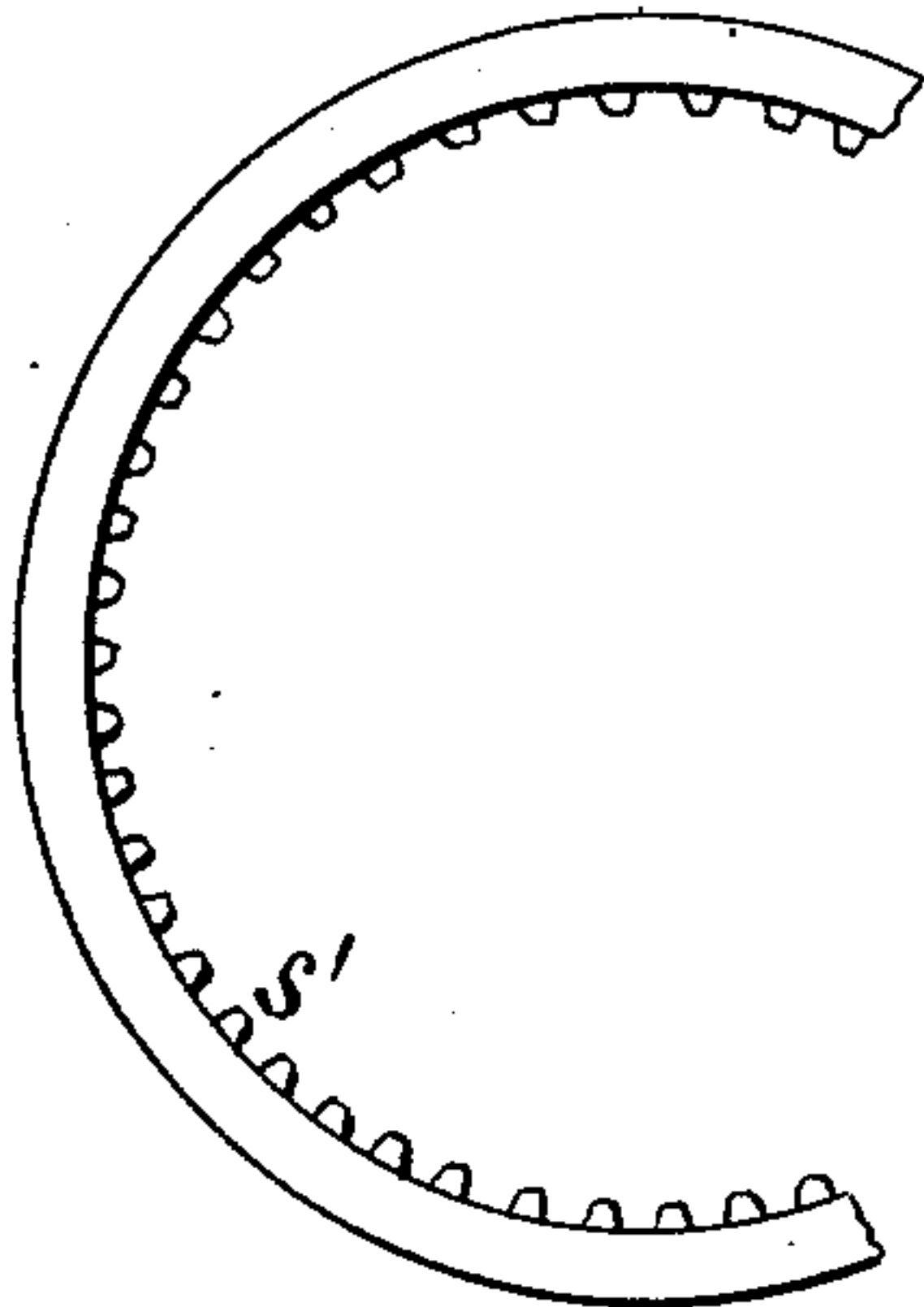


Fig. 15.

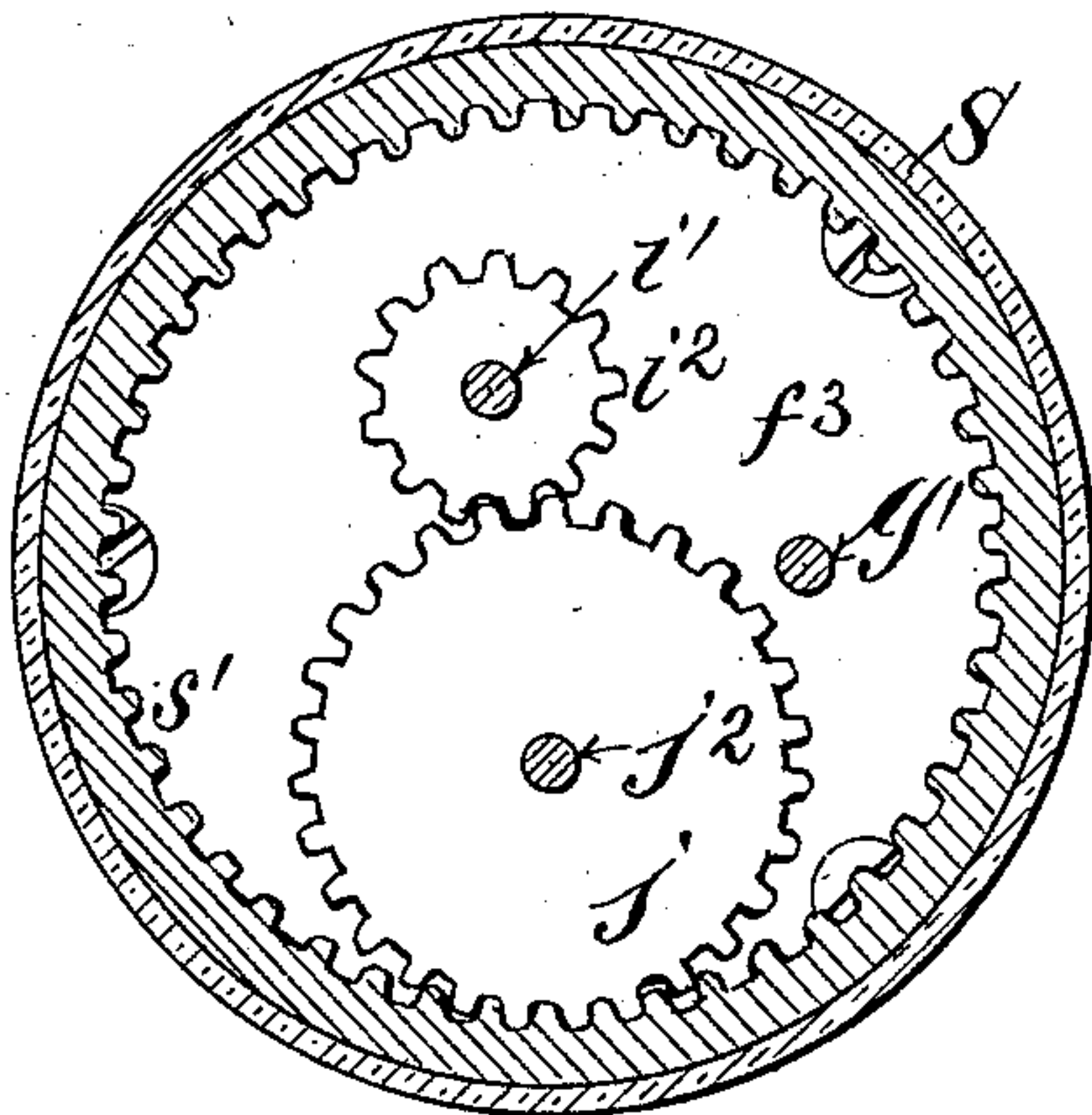


Fig. 17.

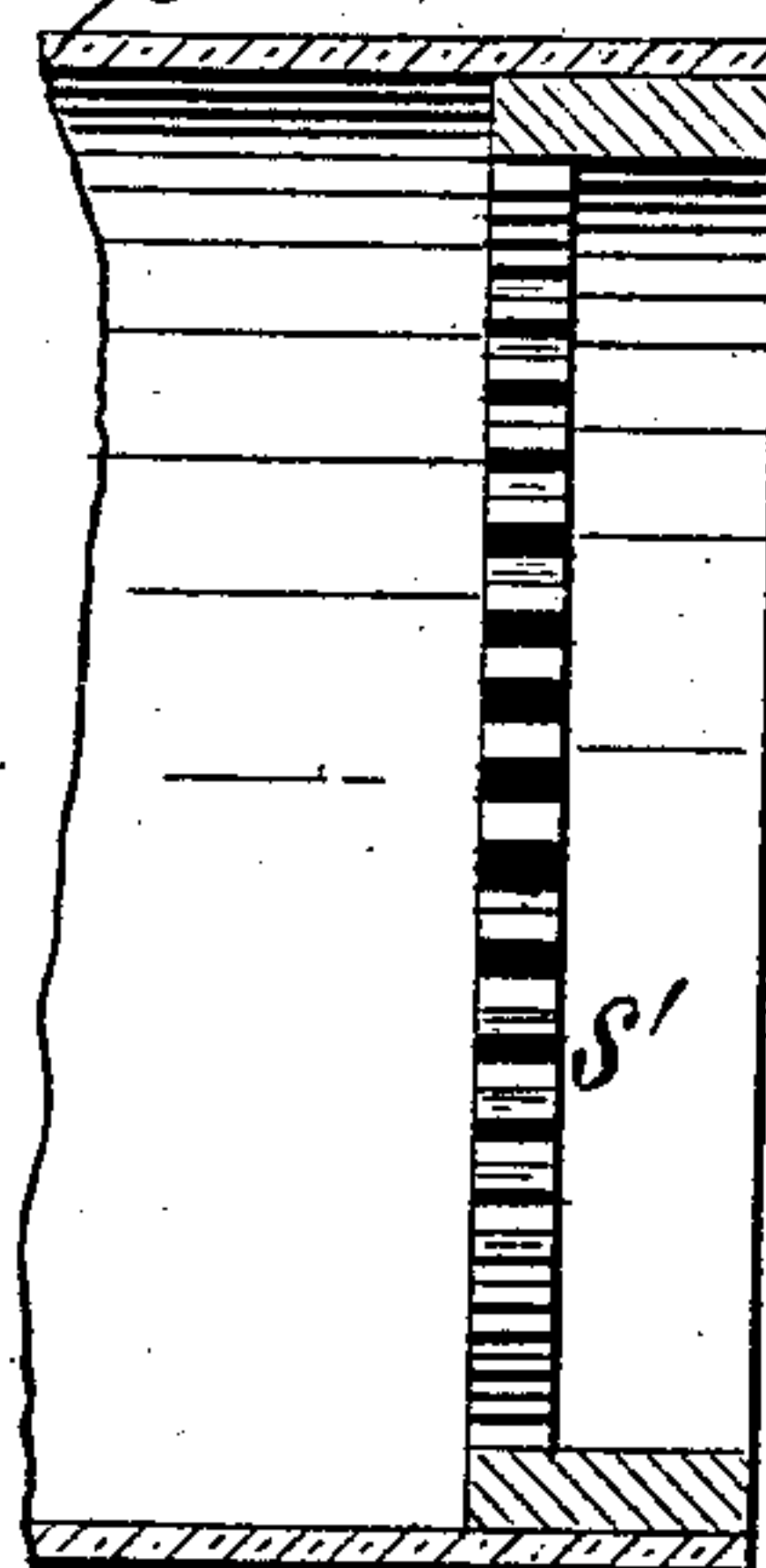


Fig. 18.

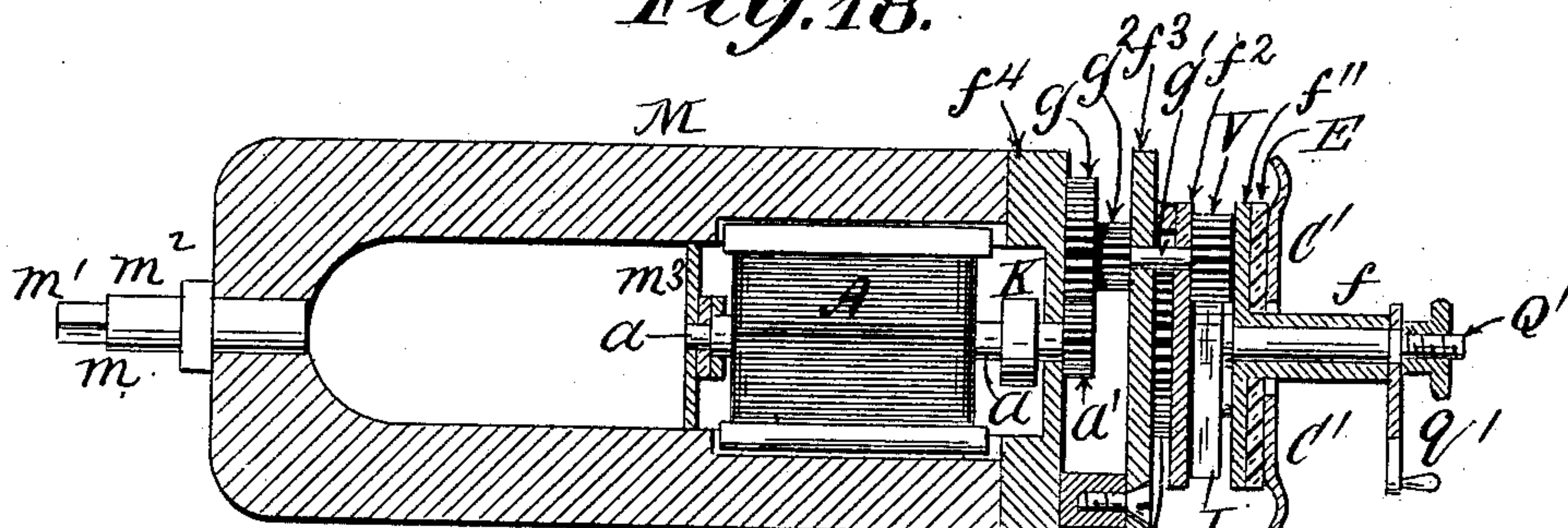
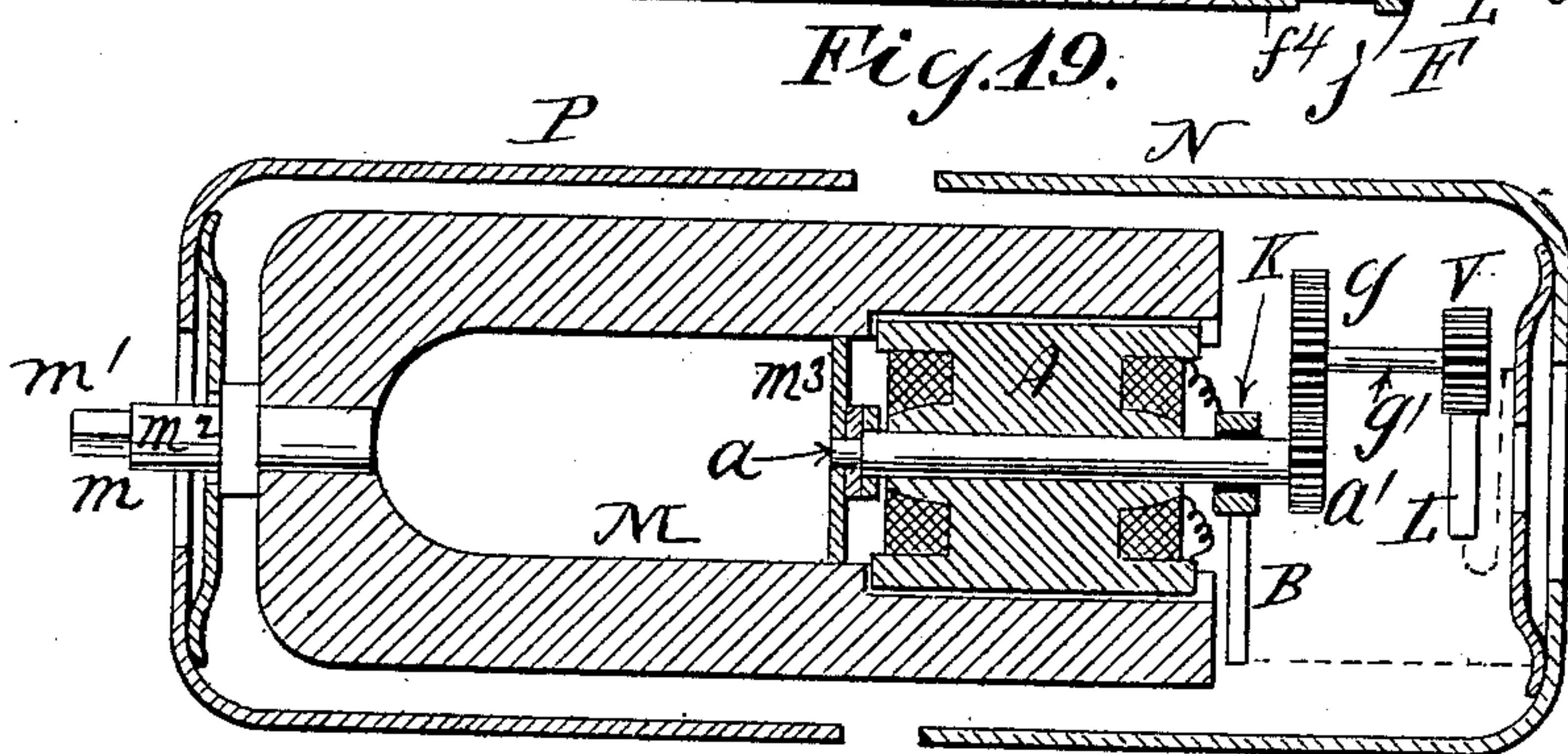


Fig. 19.



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UNITED STATES PATENT OFFICE.

CASTERAN J. MARIUS, OF WEST HOBOKEN, NEW JERSEY, ASSIGNOR TO
STEPHEN J. COX, OF NEW YORK, N. Y.

ELECTRIC ROLLER.

SPECIFICATION forming part of Letters Patent No. 715,677, dated December 9, 1902.

Application filed February 6, 1900. Serial No. 4,258. (No model.)

To all whom it may concern:

Be it known that I, CASTERAN J. MARIUS, a citizen of the United States, residing at West Hoboken, Hudson county, and State of New Jersey, have invented certain new and useful Improvements in Electric Rollers, of which the following is a specification, sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

My invention relates to means for applying electricity to the body superficially; and it consists, primarily, in utilizing the motion of a contact-roller for the purpose of operating a generator by which electricity is supplied to electrodes adapted for direct application to the body, and, secondarily, in certain special features in the construction and arrangement of parts hereinafter set forth.

In the accompanying drawings, Figure 1 is an elevation of my improved electrical roller; Figs. 2 and 3, elevations of opposite ends thereof. Fig. 4 is a sectional elevation of the roller. Fig. 5 is an elevation of the magneto and gear frame. Fig. 6 is a similar view, taken at right angles to Fig. 5. Fig. 7 is a transverse section taken upon plane of line 7 7, Fig. 5; Fig. 8, a transverse section upon plane of line 8 8, Fig. 5; Fig. 9, a transverse section upon plane of line 9 9, Fig. 5; Fig. 10, a transverse section upon plane of line 10 10, Fig. 5; Fig. 11, a view of the inner side of the switch-plate; Fig. 12, a section upon plane of line 12 12, Fig. 11, the spindle being shown in elevation; Fig. 13, a section upon plane of line 13 13, Fig. 5; Fig. 14, a view showing one of the elastic contacts; Fig. 15, a sectional elevation upon plane of line 15 15, Fig. 4; Fig. 16, an elevation of a portion of the driving-rack; Fig. 17, a section of the driving-rack and adjoining portions of the shell. Figs. 7 to 17, inclusive, are upon an enlarged scale. Fig. 18 is a sectional elevation through the magneto gear-frame, &c. Fig. 19 is a diagrammatic view showing the electric circuit.

The hollow roller R consists of a cylindrical shell S, of insulating material, upon which fit electrodes N and P, a central collar or shoulder s being preferably provided

upon the shell S, against which the opposed ends of the electrodes abut.

M represents a permanent magnet, and A an armature rotatable between the poles thereof. Attached to the poles of the magnet is suitable framework F for the support of the gearing, &c., hereinafter described. Projecting from this framework is a stud *f*, supported by one arm *h* of the handle H, another stud *m* projecting from the magnet M and being supported by the other arm *h'* of the handle. The magnet M and frame F are held rigidly between the arms *h h'* of the handle H by any suitable means, as by forming one of the studs *m* with a tenon *m'*, which is angular in cross-section, and constructing its socket in the arm *h'* to correspond or by any other mechanical expedient, the essential feature in this construction being that the magnet M and framework F shall be practically integral with the handle, having no movement thereon.

Each stud *f m* is formed with a cylindrical portion or journal *f' m'*, supporting the roller R in such manner that it is free to rotate upon its longitudinal axis. Thus the outer ends of the electrodes P and N are respectively secured to disks of insulating material D D', which bear upon the journals *f' m'* and constitute the hubs of the roller.

d d' are metallic bearing-plates secured to the hub-disks D D', and *d² d³* are washers interposed between the parts to prevent play or looseness and are merely incidental to the construction shown.

C is an elastic plate mounted upon the end of the magnet M and in electrical contact therewith and with the electrode P, and C' is a similar electrical contact-plate situated on the outer plate *f''* of the frame F and insulated therefrom by a plate E, of insulating material, but in electrical contact with the electrode N and with the brush B, which bears against the commutator K of the armature A.

The armature-shaft *a* is supported by and between the disk *f⁴*, forming the base of the frame F, and the cross-bar *m³* within the arms of the magnet M. One end of the armature-coil ends in the armature itself, while the other ends in the commutator K. The outer

end of the armature-shaft is provided with a pinion a' , which meshes into the gear-wheel g upon the counter-shaft g' , also carrying a pinion g^2 , which in turn meshes with the gear i upon the shaft i' . This latter shaft i' also carries a pinion i^2 , which meshes with the driving-gear j on shaft j' , said driving-wheel engaging directly with the annular rack s' , secured to the interior of the shell S . Thus it will be seen that (the magnet M and frame F being held rigidly by the handle H) any motion of the roller will be transmitted by the rack s' through the intermediate gearing to the armature-shaft, rotating the armature and creating electric energy.

It is obvious that the intermediate gearing employed may be varied to afford any relative speed desired, and I do not confine myself to the particular form and arrangement of parts shown in this respect. In the construction illustrated in the drawings the armature is designed to make about thirty-five revolutions to one of the roller R .

On the shaft g' is a breaker-wheel or vibrator V , the teeth or projections in which come successively in contact with a metallic tongue L when the latter is brought into proper position. This tongue L is mounted upon a rocker-arm l , pivotally connected to the disk f^2 of the frame at l' . The rocker-arm l has a stud l^2 , which engages with a slot q in the switch-arm Q . This switch-arm Q is secured to the inner end of a spindle Q' , which passes through the hollow stud f and has attached to its outer end the switch lever or handle q' , by which the metal tongue L may be thrown into or out of engagement with the breaker or vibrator V . The brush B is electrically connected with the contact-plate C' by an insulated wire, and the said disk is in like manner connected electrically with the metallic tongue L .

In Fig. 19 the essential parts are represented diagrammatically, intermediate gearing, &c., being omitted. Thus, by way of illustration, supposing the metal tongue L to be thrown out of position for contact with the teeth of the vibrator V , the current generated by the rotation of the armature A may be said to pass out from one end of the wire through the commutator K , brush B , contact-disk C' , and electrode N to the body and thence to the electrode P , which returns it by way of the contact-disk C , magnet M , cross-bar m^2 , shaft a , and armature to the other end of the wire, thus completing the circuit. When the metallic tongue L is thrown into position for contact with the teeth of the vibrator V , the result is that whenever said tongue L is in contact with a tooth of said wheel V the current flows from the contact-plate C' through said tongue L , vibrator V , and gearing to shaft a and thence again to the coil, thereby charging said coil and then discharging the same over the normal circuit first described when contact between the tongue L and vibrator-tooth V is broken. Thus an intermittent cur-

rent may be produced consisting of a series of intensified shocks when desired.

I have herein shown and described a magneto-electric generator, although it is obvious that any mechanical generator of electricity may be substituted with like result and without departing from the spirit and intent of my invention, the distinguishing feature of which is the utilization of the rotation of the contact-roller for the purpose of generating an electric current by mechanical means in a broad sense without limitation to any specific form of generator and in contradistinction to the employment of electrochemical batteries for a like purpose. In fact, the device supplies its own electricity and is not dependent upon galvanic action or external sources of supply in applying the electric current to the human body. The application of a mechanically-produced electric current to the human body in lieu of the galvanic current is also considered more beneficial and effective by medical authorities.

By my invention I attain a permanent portable electrical generating device in no wise dependent upon batteries and adapted for use under all conditions and climates, practical and commercial advantages which establish the value and importance of my improvement in the art. The device is automatic in that the act of using it upon the body generates the electrical current.

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

1. In a device for applying electricity superficially, the combination of a mechanical generator of electricity, a roller for contact with the body, means for transmitting motion from said contact-roller to said mechanical generator of electricity, and electrodes for applying the electricity from said mechanical generator to the body, whereby the rotation of the roller in contact with the body is utilized in generating a current of electricity and transmitting the same to the body.

2. In a device for applying electricity superficially, the combination of a magnetic generator of electricity, a roller for contact with the body, means for transmitting motion from said roller to the said magnetic generator of electricity, and electrodes for applying electricity from said generator to the body, whereby the rotation of the roller in contact with the body is utilized in generating a current of electricity and transmitting the same to the body.

3. In a device for applying electricity superficially, the combination of a contact-roller having peripheral electrodes, a mechanical generator of electricity, means for transmitting motion from said contact-roller to said mechanical generator of electricity, and means for conveying electricity from said generator to said peripheral electrodes, whereby the rotation of the roller in contact with the body is utilized in generating a current of electricity and transmitting it to the body.

4. In a device for applying electricity superficially, the combination of a contact-roller having peripheral electrodes, a magnetic generator of electricity, means for transmitting motion from said contact-roller to said magnetic generator of electricity, and means for conveying electricity from said generator to said peripheral electrodes, whereby the rotation of the roller in contact with the body is utilized in generating a current of electricity and transmitting it to the body.

5. In a device for treating the body superficially with electricity, the combination of a mechanical generator of electricity secured rigidly to a handle, a roller inclosing said generator and capable of independent rotation upon its longitudinal axis, peripheral electrodes upon said roller connected electrically with said generator, and means for transmitting the motion of said roller to said generator, whereby the motion of the roller in contact with the body is utilized in generating a current of electricity and transmitting it to the body.

6. In a device for treating the body superficially with electricity, the combination of a magnetic generator of electricity secured rigidly to a handle, a roller inclosing said generator and capable of independent rotation upon its longitudinal axis, peripheral electrodes upon said roller connected electrically with said generator, and means for transmitting the motion of said roller to said generator, whereby the motion of the roller in contact with the body is utilized in generating a current of electricity and transmitting it to the body.

7. In a device for applying electricity superficially, the combination of a magnetic generator of electricity and a gear-frame attached thereto, said generator and framework being mounted rigidly upon and between the arms of a bifurcated handle, a roller inclosing said generator and frame and capable of independent rotation upon its longitudinal axis, an internal annular rack attached to said roller, intermediate gearing connecting said annular rack with the armature of the generator, and electrodes connected electrically with said generator for the purpose of imparting the electricity resulting from the rotation of the roller directly to the body, substantially as set forth.

8. In a device for applying electricity superficially, the combination of a magnetic generator of electricity and a gear-frame attached thereto, said generator and frame being mounted rigidly upon and between the arms of a bifurcated handle, a roller inclosing said generator and frame and capable of independent rotation upon its longitudinal axis, an internal rack attached to said roller, intermediate gearing upon said frame, connecting said annular rack with the armature of the

generator, and peripheral electrodes upon said contact-roller connected electrically with said generator for the purpose of transmitting the electricity direct to the body, substantially as set forth.

9. In a device for applying electricity superficially, the combination of the magnet M, armature A, and frame F, said magnet and frame being supported rigidly by and upon the handle H, *h*, *h'*, the shell S, provided with the annular rack *s'*, the intermediate gearing for transmitting motion from said annular rack *s'*, to the armature-shaft, and the peripheral electrodes interposed in the electrical circuit substantially as set forth.

10. In a device for applying electricity superficially, the combination of the magneto-electric generator mounted rigidly upon the handle H, the internal rack *s'*, and intermediate gears for rotating the armature of said magneto-electric generator, the inclosing roller attached to said rack *s'*, peripheral electrodes interposed in the electric circuit, and a contact-breaker also interposed in said circuit for the purpose and substantially in the manner set forth.

11. In a device for applying electricity superficially, the combination of the magneto-electric generator mounted rigidly upon the handle H, the internal rack *s'*, and intermediate gearing for rotating the armature of said magneto-electric generator, the inclosing roller attached to said rack *s'*, peripheral electrodes interposed in the electric circuit, a current-breaker also interposed in said electric circuit, an adjustable contact for said circuit-breaker, and means for regulating and controlling said adjustable contact externally, substantially as set forth.

12. In a device for supplying electricity superficially, the combination of the magnet M, armature A, and frame F said magnet and frame being mounted rigidly upon and between the arms *h*, *h'*, of the handle H, the shell S, having the internal annular rack *s'*, secured thereto, the intermediate gearing upon the frame F transmitting the motion from said rack *s'*, to the armature-shaft, the circuit-breaker V, and contact-tongue L, interposed in the electrical circuit, the rocker-arm *l*, carrying said tongue L, and provided with the stud *l'*, the slotted switch-arm Q, the spindle Q', attached thereto, and extending through the hollow stud *f*, said hollow stud, means for partially turning the spindle Q', and the peripheral electrodes P and N interposed in the electric circuit for the purpose and substantially in the manner described.

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Witnesses:

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D. W. GARDNER.