

(No Model.)

2 Sheets—Sheet 1.

G. GIBBS.
ELECTRIC CONNECTOR.

No. 468,654.

Patented Feb. 9, 1892.

Fig. 1.

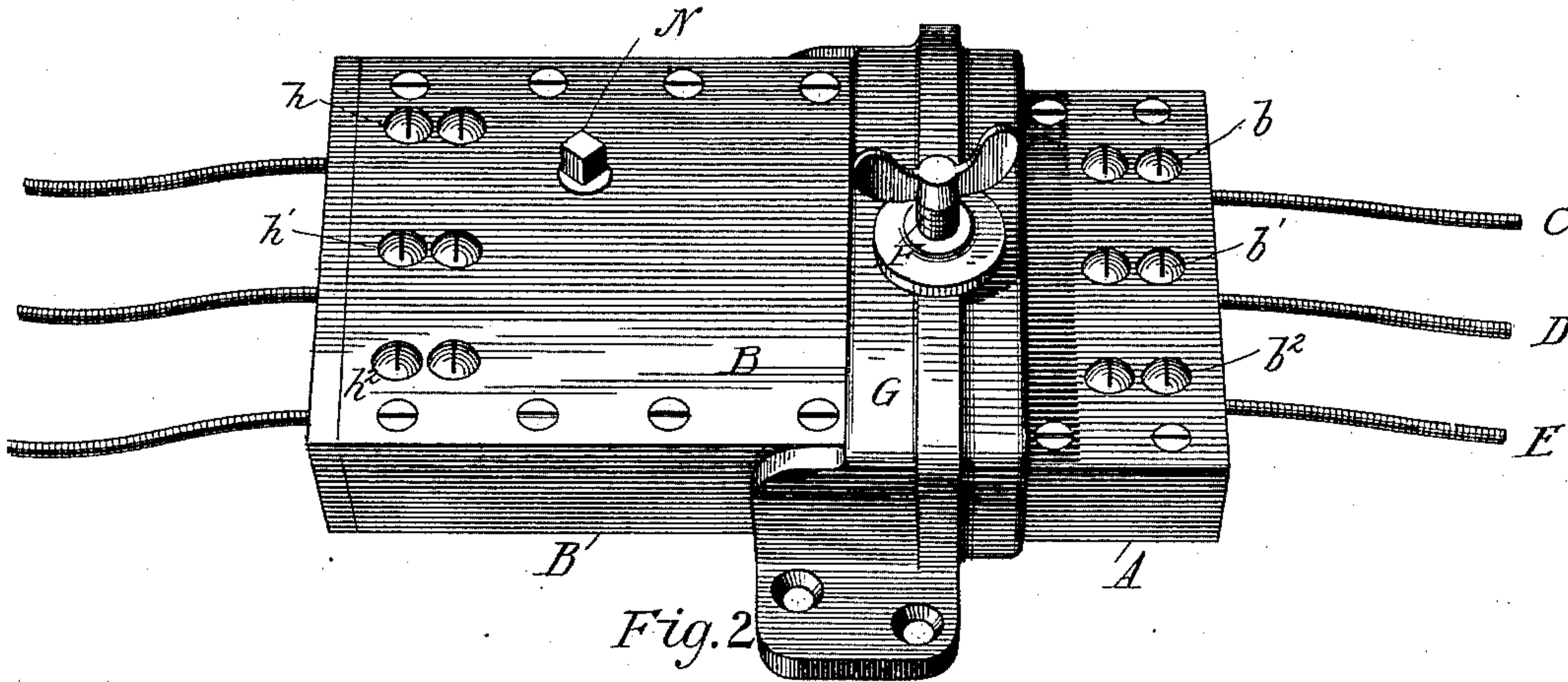


Fig. 2.

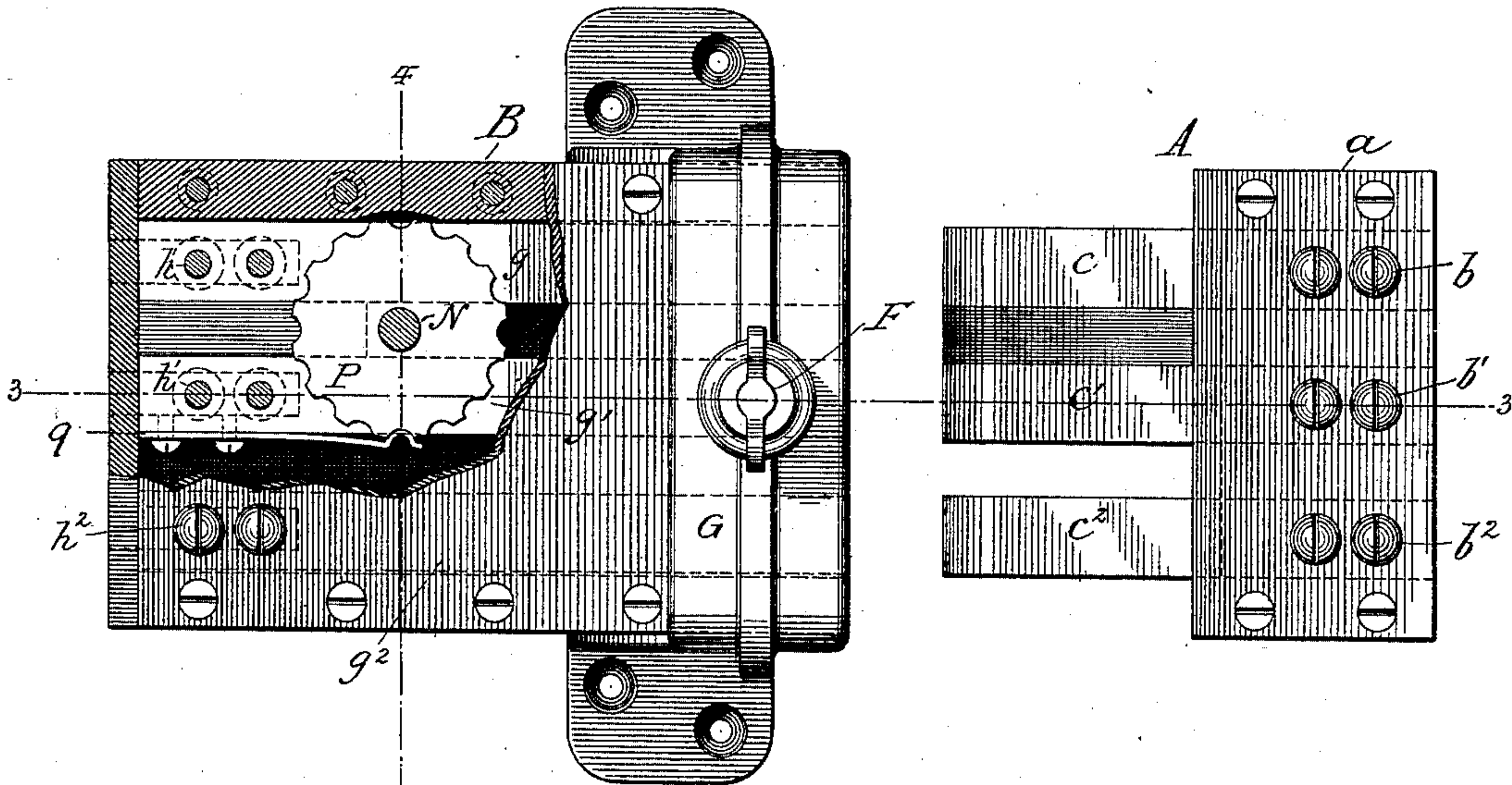
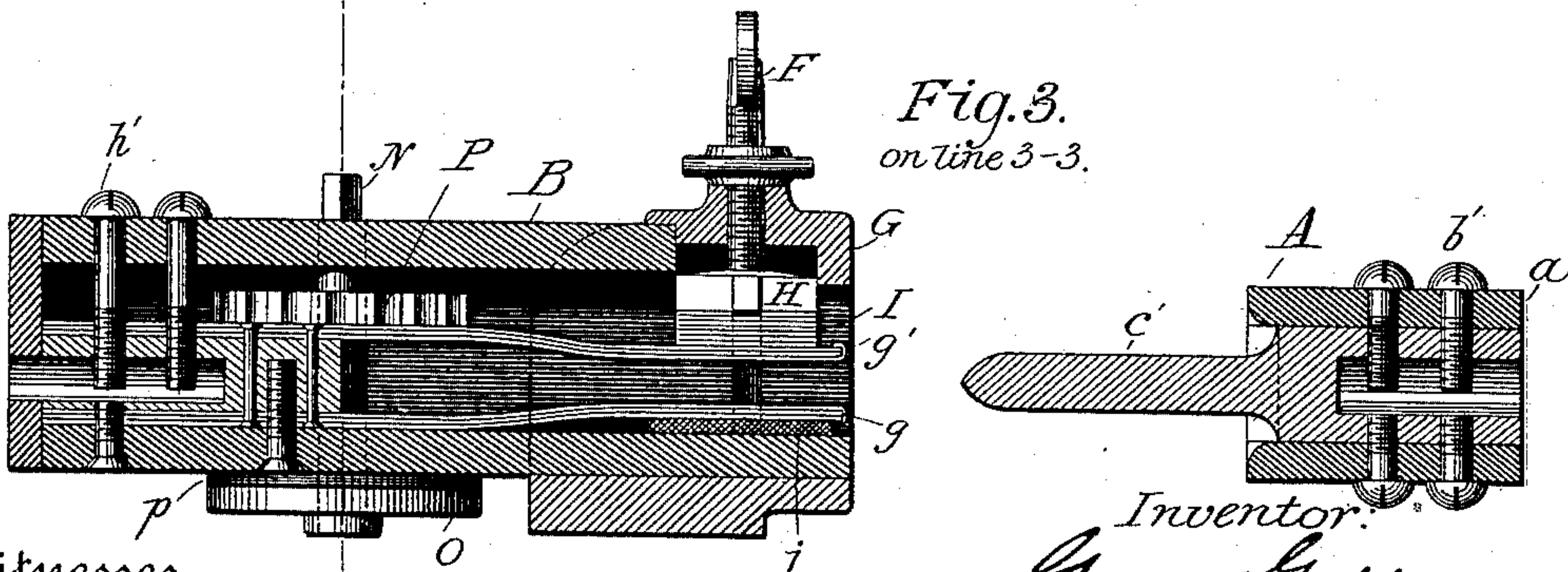


Fig. 3.
on line 3-3.



Witnesses

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By Phil T. Lodge,
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.
on line 4-4.

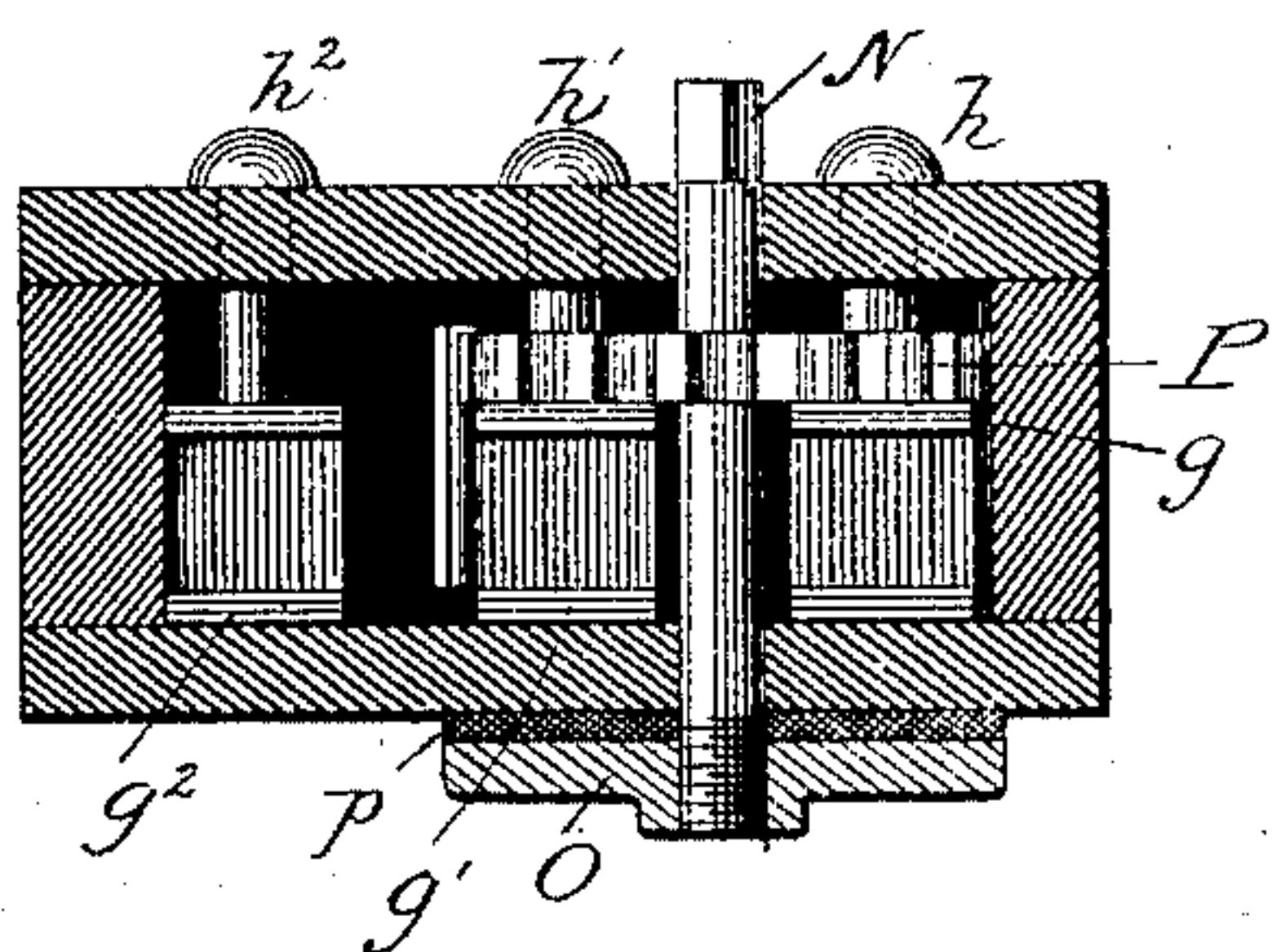


Fig. 5.

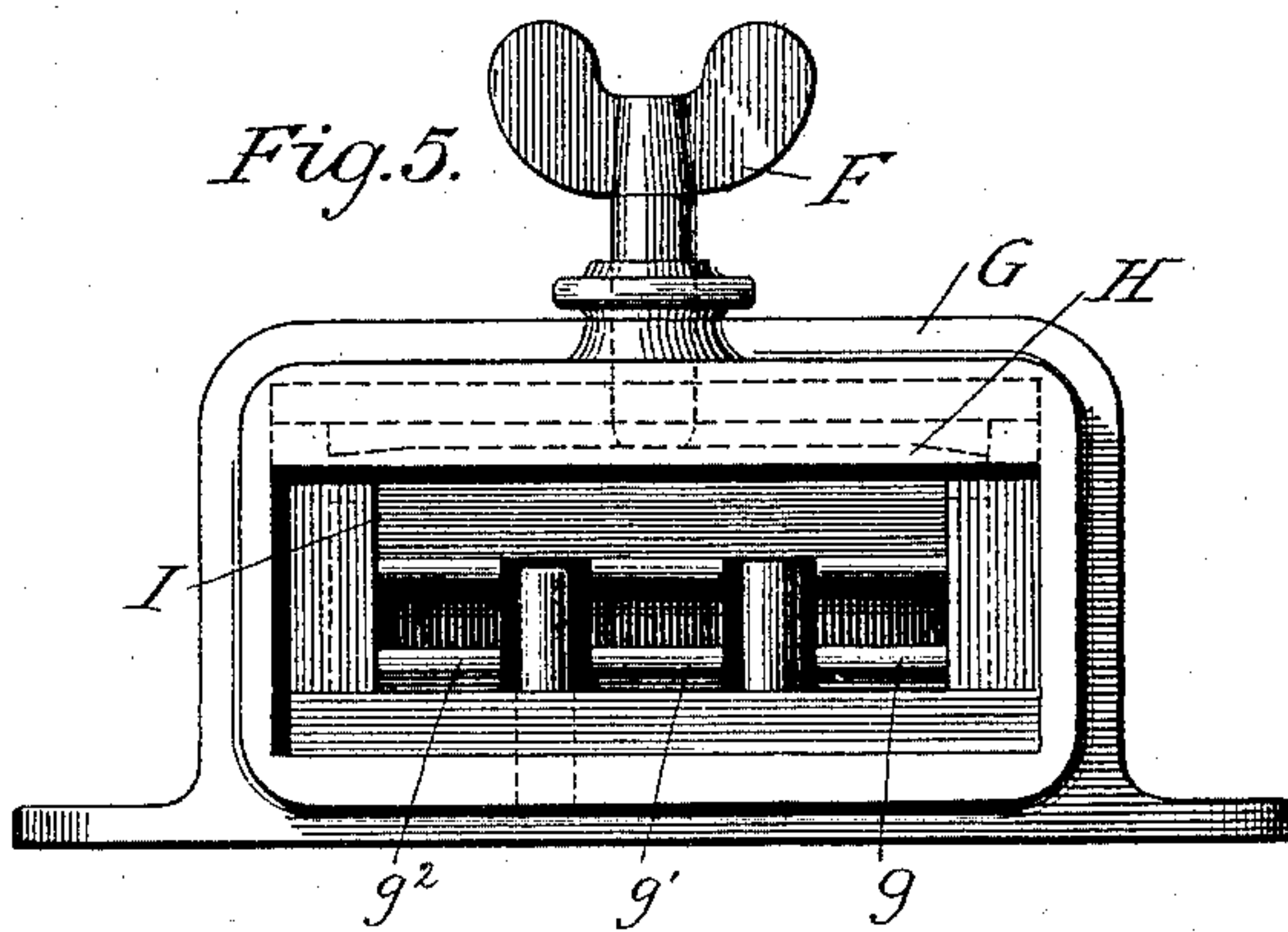


Fig. 6.

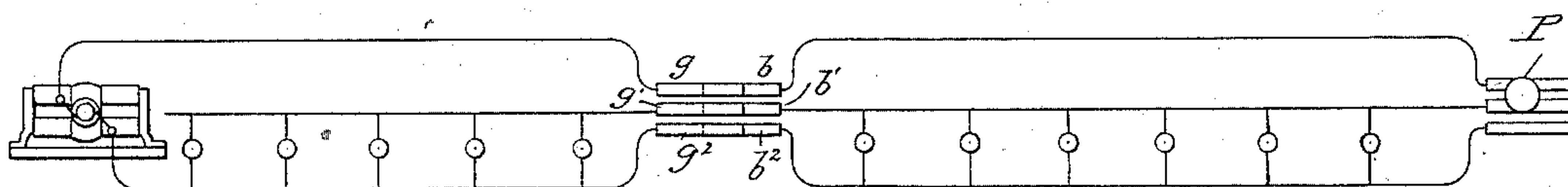


Fig. 7.

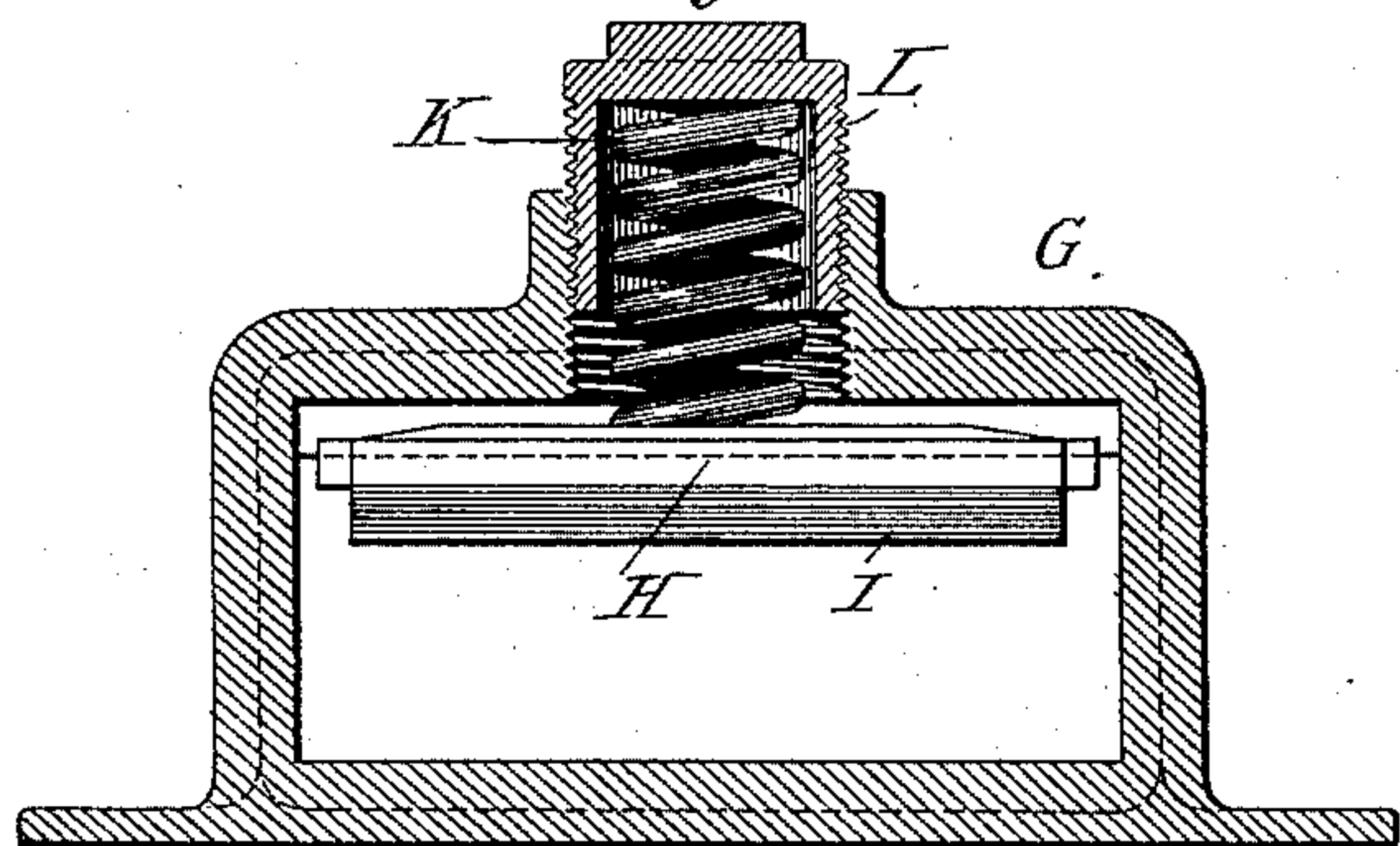


Fig. 9.

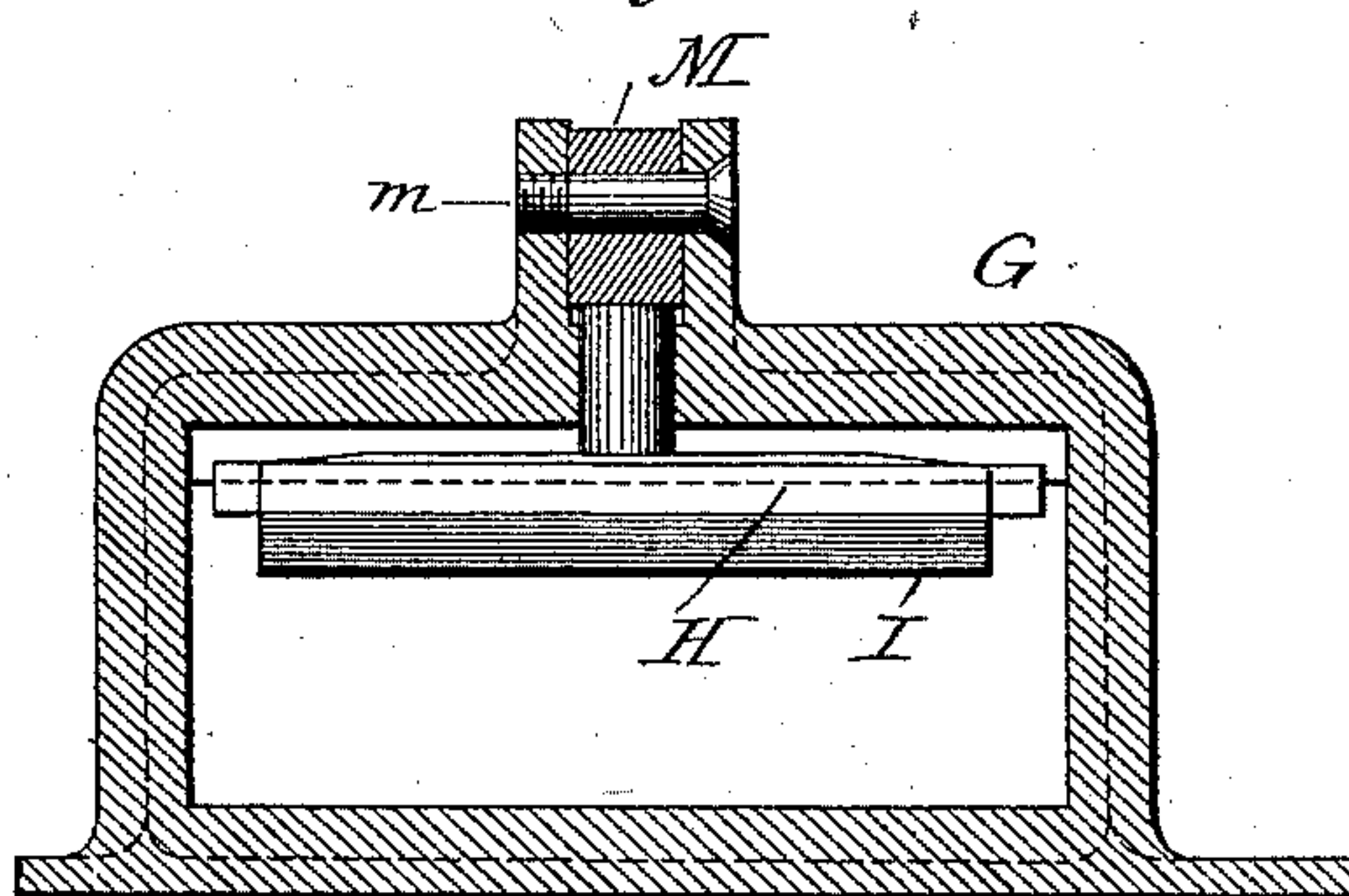


Fig. 8.

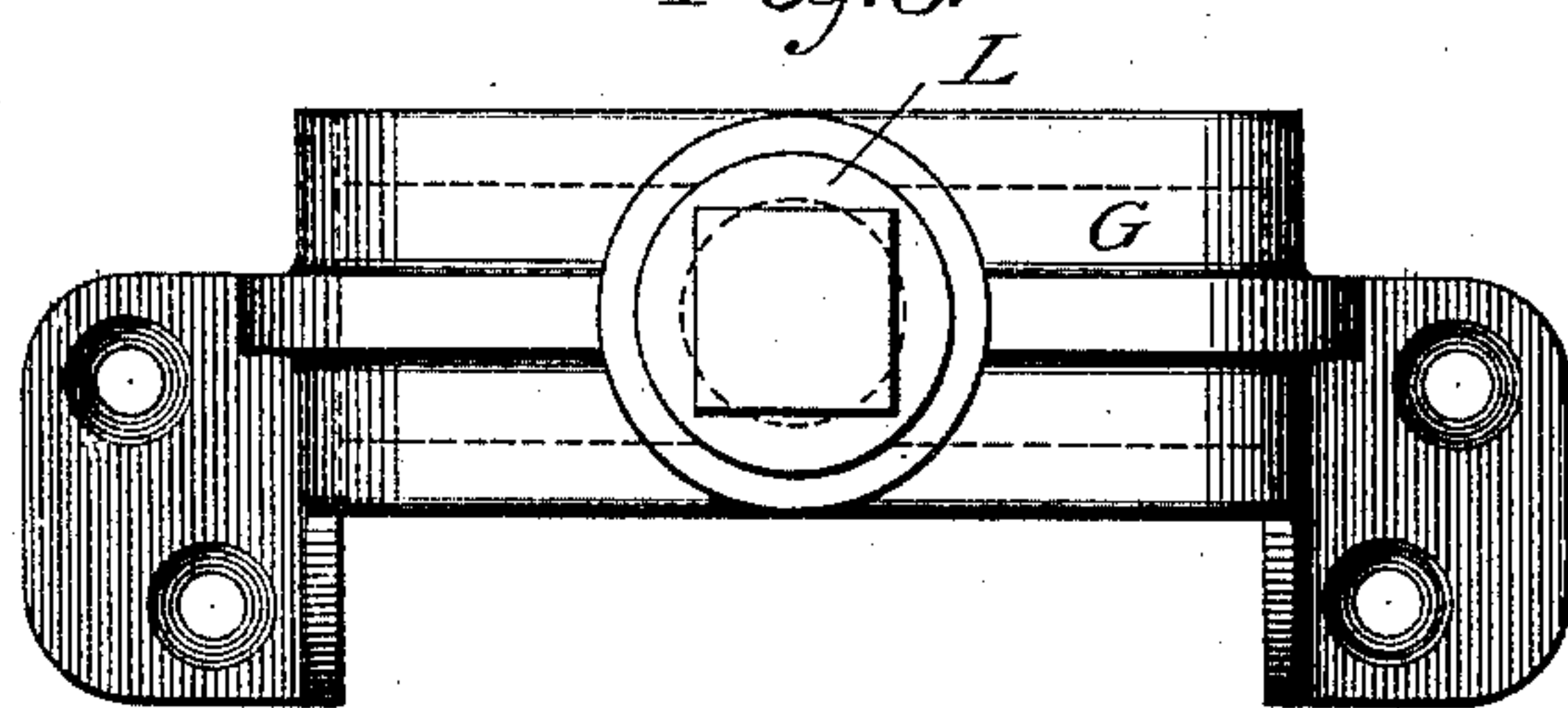
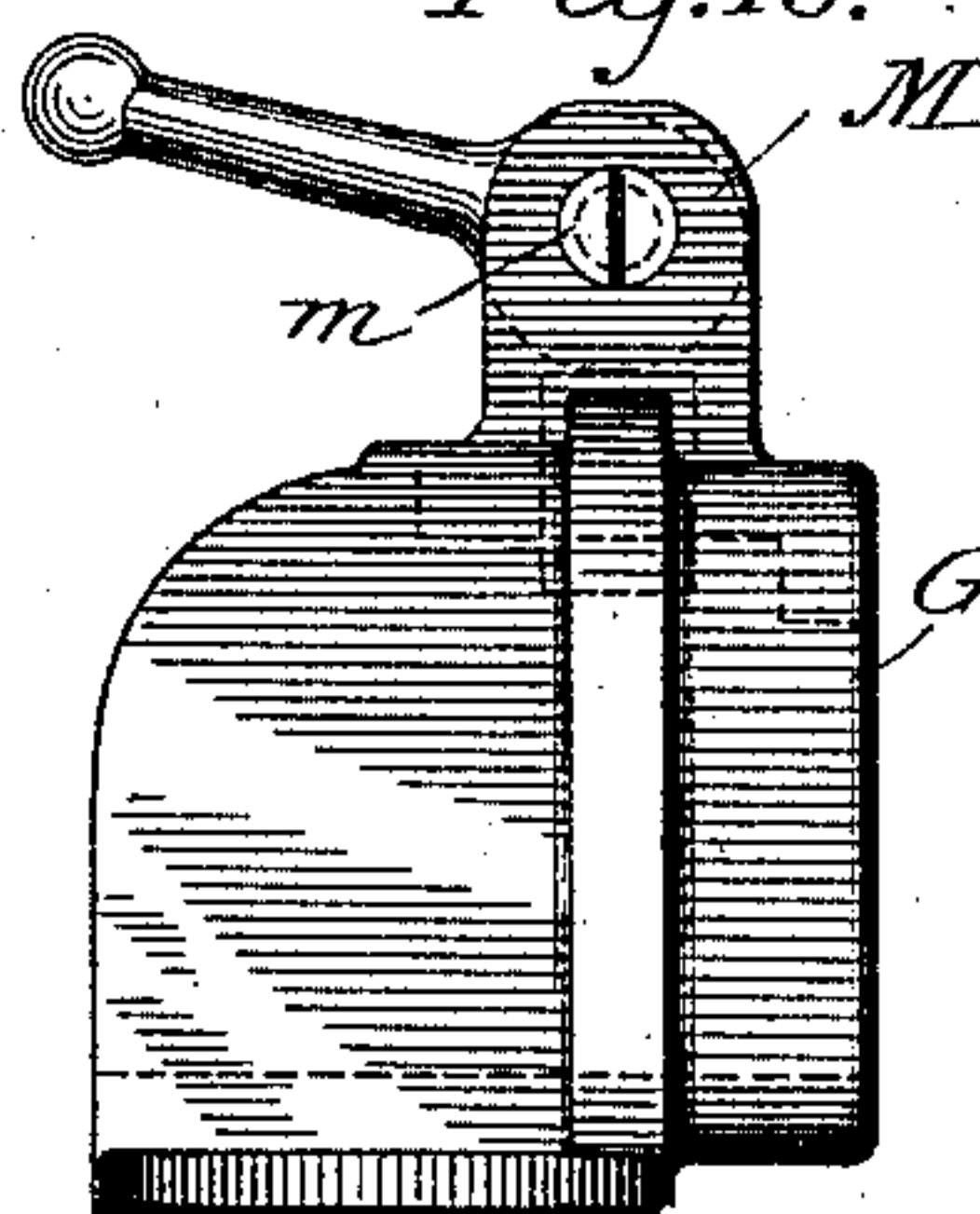


Fig. 10.



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UNITED STATES PATENT OFFICE.

GEORGE GIBBS, OF MILWAUKEE, WISCONSIN.

ELECTRIC CONNECTOR.

SPECIFICATION forming part of Letters Patent No. 468,654, dated February 9, 1892.

Application filed November 23, 1891. Serial No. 412,833. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GIBBS, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Electric Connectors, of which the following is a specification.

At the present day it is a common practice to light railway-cars by electric lights operated in connection with a series of conductors extended lengthwise of the train, three parallel conductors being commonly employed. To permit the ready coupling and uncoupling of the cars, the conductors are provided at the ends of the cars with coupling or connecting devices generally known in the art as "connectors," each adapted to establish connection between the several conductors on the one and the corresponding conductors on the next car.

It is to this class of connectors that my invention relates, its object being to overcome various troubles experienced in the operation of connectors heretofore in use. The practical requirements are that the connector shall have sufficient conducting capacity to carry the current without heating; that the connection shall be quickly and conveniently made; that the connection shall be absolutely certain and good; that the parts shall be readily accessible for examination and repair, and that the joints shall be weather-tight. Heretofore the connectors in use were generally combinations of fingers, either rigid or elastic, which were slipped one into another, reliance being placed upon the moderate pressure of the spring to maintain the contact. In my connector I employ elastic contact-strips, which give a moderate initial contact-pressure, in combination with clamping devices whereby pressure may be applied to insure firm contact of the conductors.

The invention also involves the employment of means whereby two of the conductors at one end of the train may be coupled together for use in what is known as the "return-loop system."

In the accompanying drawings, Figure 1 is a perspective view of my connector in operative condition. Fig. 2 is a plan view of the same, the two members being separated and portions broken away to show the internal construction. Fig. 3 is a longitudinal vertical

section on the line 3 3 of the preceding figure. Fig. 4 is a transverse section on the line 4 4 of Figs. 2 and 3. Fig. 5 is an end view of one of the members. Fig. 6 is a diagram illustrating the manner in which the device is used in the return-loop system of lighting. Figs. 7 and 8 are respectively a cross-section and a plan view of an alternative construction of the pressure devices. Figs. 9 and 10 are respectively a cross-section and a side elevation of the pressure device in still another form.

In the drawings I have shown a connector adapted for a three-wire system. A and B represent the two parts of a connector intended for attachment to the conductors of different cars and to be joined and separated at will. The member A consists of a jacket or casing *a*, of any suitable non-conducting material, containing three independent metal conducting-fingers *c*, *c'*, and *c''*, projecting in parallel lines and rounded or tapered at their ends that they may be thrust the more readily into the other member. These conducting-fingers are provided with suitable binding-screws *b* *b'*, &c., by which they may be connected with the electric conductors or mains C, D, and E. The part B consists, primarily, of an external casing of non-conducting material, in any suitable form, containing three pairs of elastic metal fingers *g*, *g'*, and *g''* of such size and arrangement as to admit of the fingers *c* *c'*, &c., being thrust inward between them in order to establish an electrical connection. The fingers of each pair are riveted at their rear ends to intervening blocks of metal, as shown, or otherwise connected, and are secured firmly in place in the casing, and at the rear ends they are provided with binding-screws *h*, *h'*, and *h''*, to which the respective mains or conductors are secured. When the fingers of the part A are thrust into the part B between the spring-fingers, an electric connection is thereby established from each conductor of one car to the corresponding conductor of the next. In order, however, to insure the contact between the conducting-fingers and springs, I mount a pressure-screw F in a yoke G or other support fixed to the part B, and beneath the end of this screw I locate the plate H, acting through an intervening strip of rubber I upon the underlying spring-fingers, so that when the screw is turned

down it acts through the intermediate parts to force the springs on one side toward those on the other, and thus to compress or bind the fingers *c* firmly in place and to insure intimate contact between the surfaces. In order to distribute the pressure and insure the contact, I prefer to employ a rubber or other yielding strip *j* under the lower fingers, as shown in the drawings. The spring-fingers will be subjected to a yielding inward pressure on both sides.

While I prefer to make use of the screw as a clamping device and to mount the same in the metal yoke or frame *H*, fixed to and encircling the end of the casing, I may employ pressure devices of any equivalent character, such, for example, as are shown in Figs. 7, 8, 9, and 10. In Figs. 7 and 8 the pressure-plate *H* is acted upon by a spring *K*, which is in turn seated at one end within a screw *L*, mounted in the yoke or frame, so that after the two parts of a connector are united the screw may be turned down and the tension of the spring increased, so as to increase the pressure between the fingers to any required extent. In Figs. 9 and 10 the pressure-plate *H* is operated by an eccentric *M*, mounted on a pivot *m* in the yoke or frame, so that after the two parts of the connector are brought together the depression of the eccentric will serve to force the plate down and bind the conductors together.

When the lighting is effected by what is known as the "return-loop" system, in which three wires extending the entire length of the train are employed, as shown in Fig. 6, it is desirable to connect two of these wires or conductors with each other at the rear end of the train. To this end I propose to provide my connecting-member *B* with means for establishing electric connection between two of its pairs of conducting-fingers. These connecting devices to be thrown into and out of action at will may be constructed in various ways; but in its preferred form it consists, as shown in Figs. 2, 3, and 4, of a screw-spindle *N*, passed through the case or body and screwed at one end into a plate *O*, the spindle being provided midway of its length with a metallic plate *P* of such size and location that when the spindle is screwed down into the body this plate will bear upon and establish electrical communication between the conducting-fingers *g* and *g'*.

In order to insure a firm but elastic pressure, I commonly seat the bearing plate or nut *O* upon an underlying sheet of rubber or other elastic material *p*.

In order to prevent the parts from jarring

out of position—that is to say, into or out of contact accidentally—I propose to provide them with detents or locking devices of any appropriate character—such, for example, as a spring-arm *q*, fixed to the casing at one end and adapted to engage at the opposite end in notches in the periphery of the plate or disk *P*.

Having thus described my invention, what I claim is—

1. In a multiple electric connector, a member provided with conducting-fingers, in combination with a second member provided with corresponding conducting-fingers and with a clamping mechanism to bind the fingers of the two members forcibly together.

2. In a multiple electric connector, the member *A*, provided with conducting-fingers, in combination with the member *B*, provided with conductors arranged in pairs to admit the fingers of the first member, and mechanism to clamp the connecting-fingers tightly in contact.

3. In an electric connector, a member provided with a conducting-finger, a second member provided with a pair of conductors to embrace said finger, a clamping mechanism to bind the conductors against the intermediate finger, and an elastic cushion, combined with the clamp to moderate the pressure.

4. In an electric connector, the two co-operating separable members provided each with three conductors, in combination with an adjustable conductor, substantially as described, for connecting two of the conductors of one member at will.

5. In an electric connector, the member having three conductors, in combination with the screw-spindle having the disk to connect two of the conductors at will.

6. In an electric connector, the member having three conductors, in combination with the disk for connecting two of said conductors, its actuating-screw, the nut, and the yielding support for the nut.

7. In an electric connector, a member provided with conducting-fingers, a second member provided with conductors to embrace said fingers, a clamping mechanism to bind the conductors against the intermediate fingers, and an elastic cushion, combined with the clamp to equalize the pressure.

In testimony whereof I hereunto set my hand this 25th day of September, 1891, in the presence of two attesting witnesses.

GEORGE GIBBS.

Witnesses:

W. H. ELLIOTT,
R. R. HOSKING.