No. 705,561. Patented July 29, 1902.

W. H. CHAPMAN.

RHEOSTAT.

(Application filed Dec. 14, 1901.)

(No Model.)

Fig. 3.

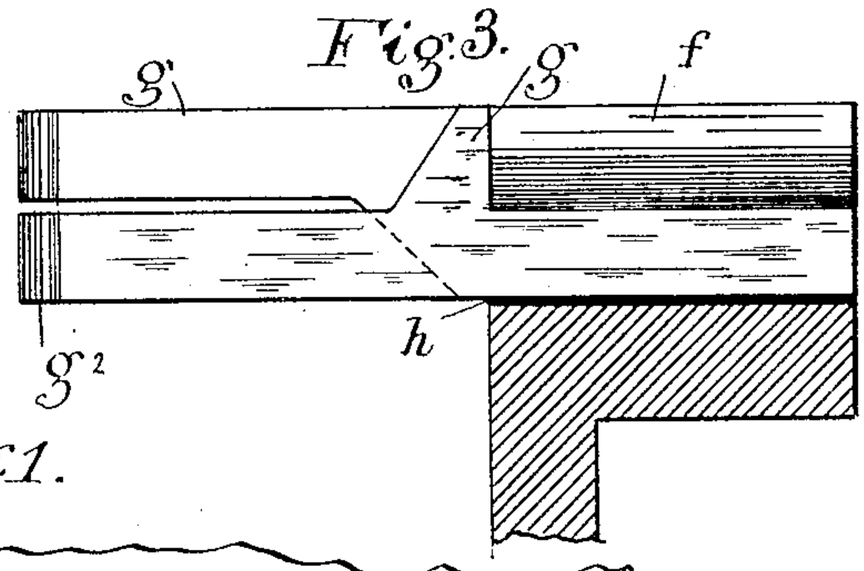


Fig. 1.

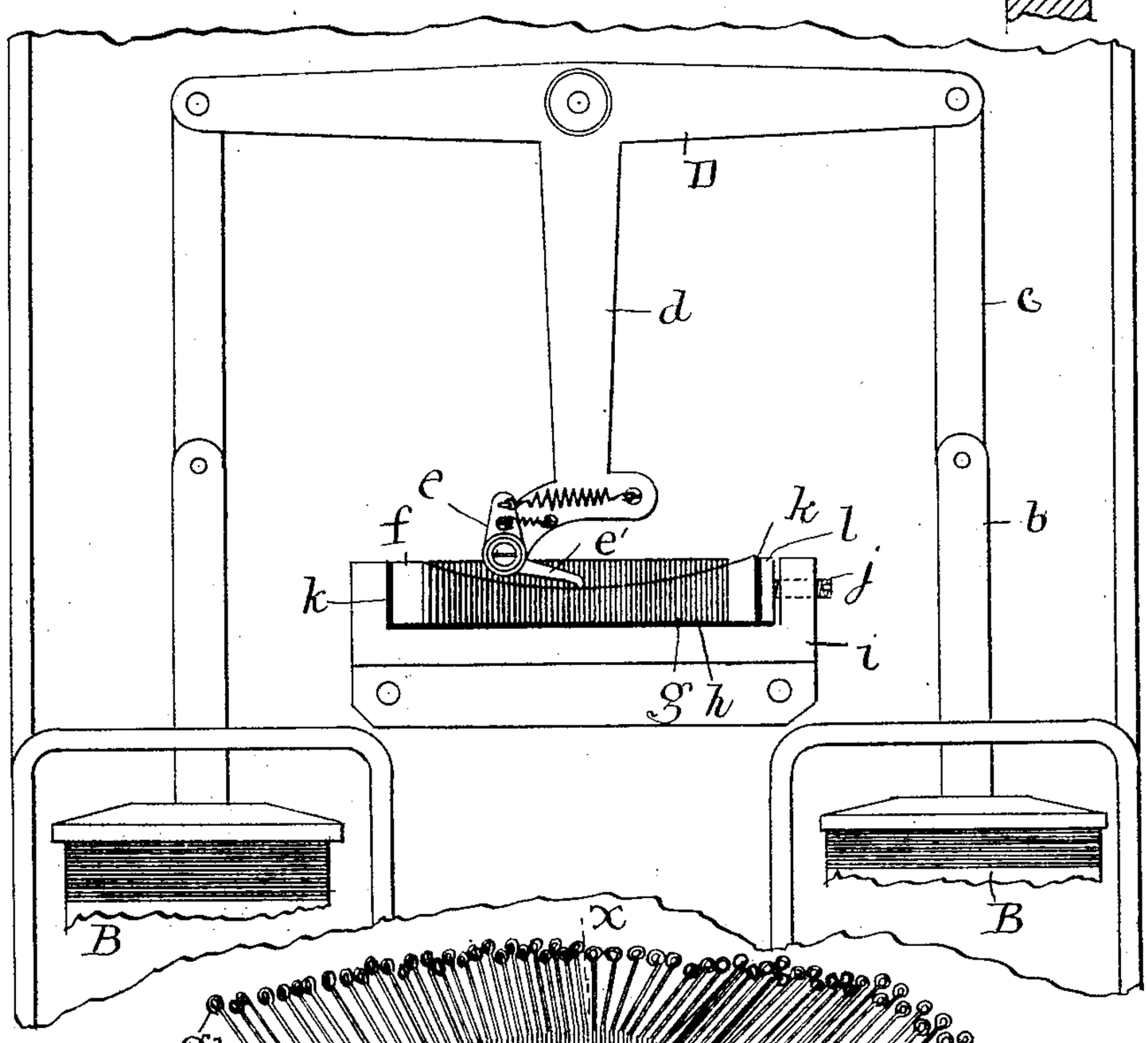
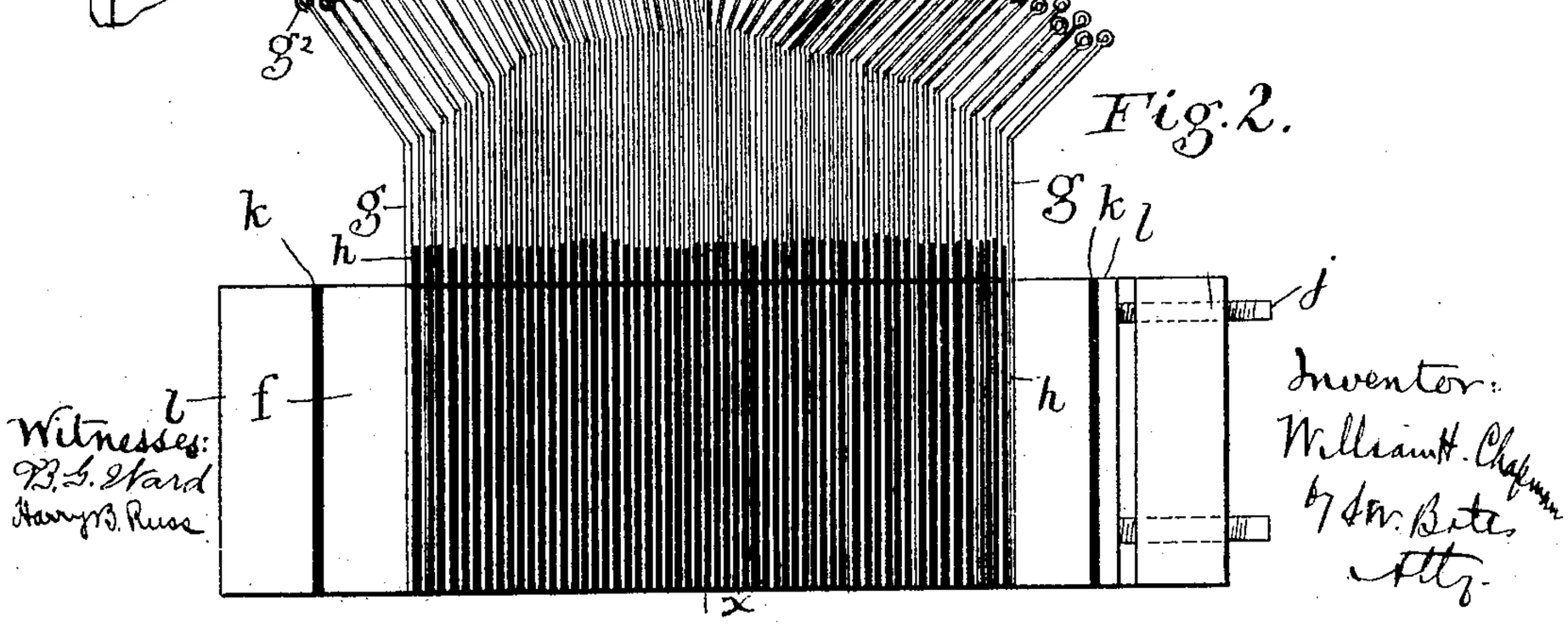


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. CHAPMAN, OF PORTLAND, MAINE.

RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 705,561, dated July 29, 1902.

Application filed December 14, 1901. Serial No. 85,872. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CHAPMAN, a citizen of the United States of America, and a resident of Portland, Cumberland county, State of Maine, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

My invention relates to rheostats, and particularly to an improved construction of the segments by which I am enabled to operate the rheostat with very little friction; and it is designed to be used in automatic machines like voltage-regulators, where it is important to have little friction and extreme sensitiveness. These devices are provided with swinging arms operated by solenoids or other similar means, and these arms are provided with spring-pressed contacts which slide along the segments as the arm swings back and forth to throw in more or less resistance. It is obvious that the wider the segments over which the contact has to travel the greater must be the distance it must travel to throw in a given number of resistances and the more friction must be developed in the operation of the device.

The object of my invention then is to narrow up as much as possible the width or thickness of the segments over which the contact slides, and to do this I make use of comparatively thin segment-plates, clamping them tightly together at the front with the proper insulating material interposed between them and extending and spreading the rear ends to give room for making the proper connections with the wires. Half of the rear portion of each segment is cut away, the upper half on every other one and the lower half on the remainder, so that the rear ends of each two adjacent segment-plates may be swung by each other to allow room for soldering, &c. In this way it is possible to crowd in a great number of segments in a small space, at the same time leaving their rear ends sufficiently apart for soldering the wires.

I illustrate my invention by means of the accompanying drawings, in which—

Figure 1 is a front view of a portion of the voltage-regulator patented to me May 1, 1900, with my improved segments in place. Fig. 2 is a plan view of the segments on an enlarged scale, and Fig. 3 is a section taken on the line $x\ x$ of Fig. 2.

A represents the frame.

B B are the solenoids; $b\ b$, the cores of the solenoids; $c\ c$, the connecting-rods, and D the T-shaped lever, having two horizontal arms connecting with the cores b and a vertical arm d, carrying a spring-pressed contact, here shown as a lever, having a vertical arm e, connected by a spring to the arm d, and a contact-finger e', adapted to slide over the upper edges of the contact-plates.

The above-described parts or their equivalents are common to my patented device and need no further description.

For the purpose of decreasing the friction between the contact-point and the segment-plates and to bring as many segment-plates as possible within the limits of movement of the contact I form the segment-plates g of comparatively thin sheets of copper, with thin sheets h of insulating material between them. The front ends of these plates are firmly clamped together in the frame i by means of set-screws j, acting against a pressure-bar l, sheets of mica k being interposed between the end segments f and the adjacent parts of the frame and beneath the segments. The upper surface of the segment-section is made concave to conform to the path of the contact-finger e', and the rear ends of the segment-plates are extended rearward a considerable distance and are provided with loops g^2 to receive the wires necessary to connect them with the resistance units. These segment-plates are made just thick enough to carry the necessary current and no thicker, so that as many as possible may be put within the limits of motion of the contacts e'. In order to spread the rear ends so that the loops g^2 will not interfere with each other, I cut away the rear ends of the plates, a trifle more than half being cut from each one, first the upper half of one plate and the lower half of the next plate. This enables two adjacent loops to swing around so as to clear each other, and the result is that the loops take up only one-half the space horizontally that they otherwise would. It will be seen that with this arrangement of segments the sensitiveness of my regulator is greatly increased

as the friction is reduced, since the distance which the contact has to travel is reduced, and a small motion of the cores of the solenoids and of the arm *d* will throw in or take off a comparatively large number of resistance units. By the use of a large number of segments and resistance units the changes of voltage are effected more gradually than where a small number are used.

I have illustrated my device as applied to my voltage-regulator; but it is evident that it may be used on devices similar in character working automatically.

I claim—

In a rheostat, the combination of a swinging arm, a spring-pressed contact on said arm, a series of thin segment-plates on which said contact is adapted to travel, insulating-plates between said segment-plates, said segment-plates being closely clamped together at their front ends and spread apart at their rear ends, the upper half of the rear portion of every other plate and the lower half of the balance of the plates being cut away so that the rear ends of adjacent plates may be swung over each other.

Signed at Portland, Maine, this 9th day of December, 1901.

WILLIAM H. CHAPMAN.

Witnesses:

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