

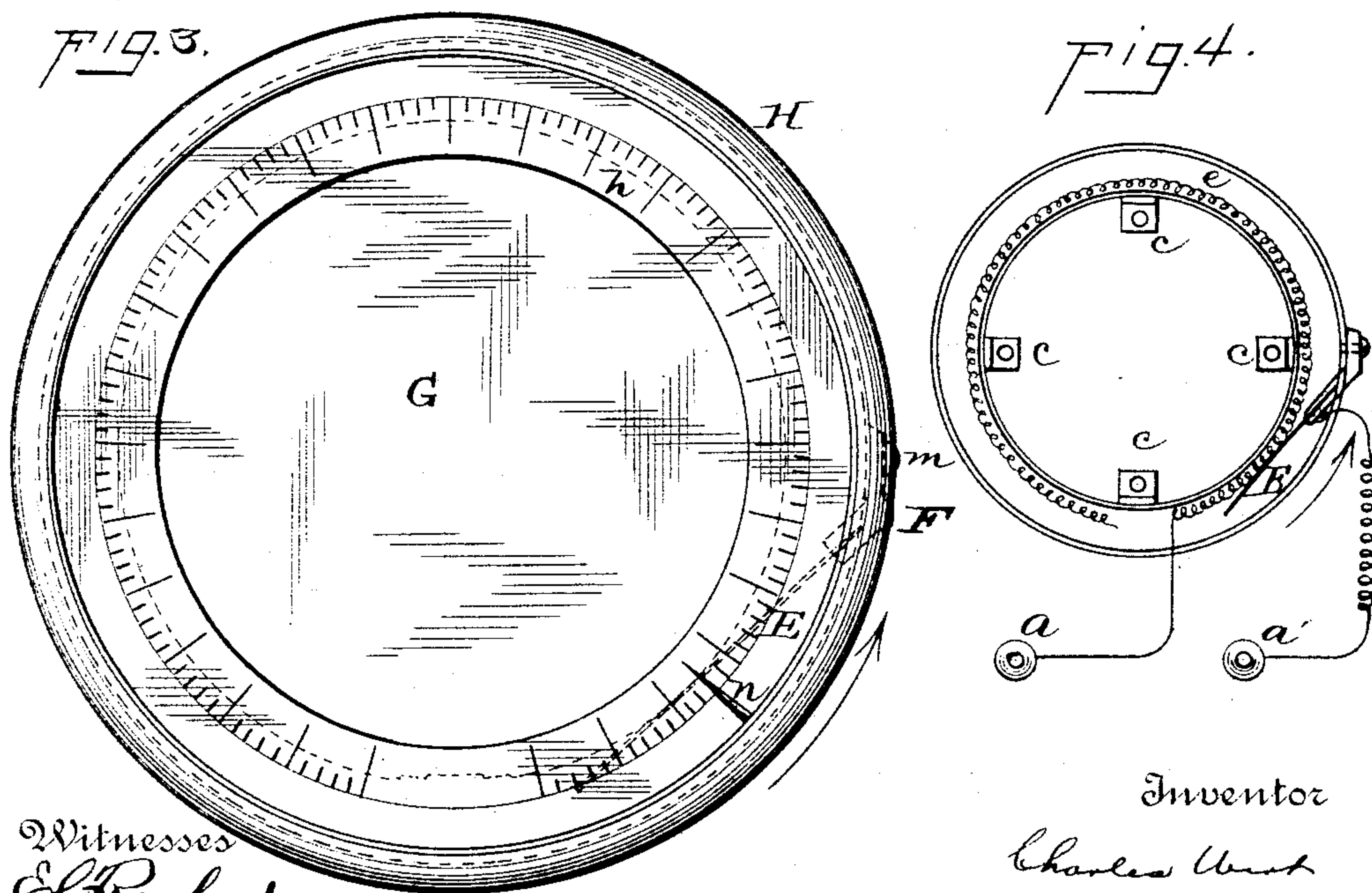
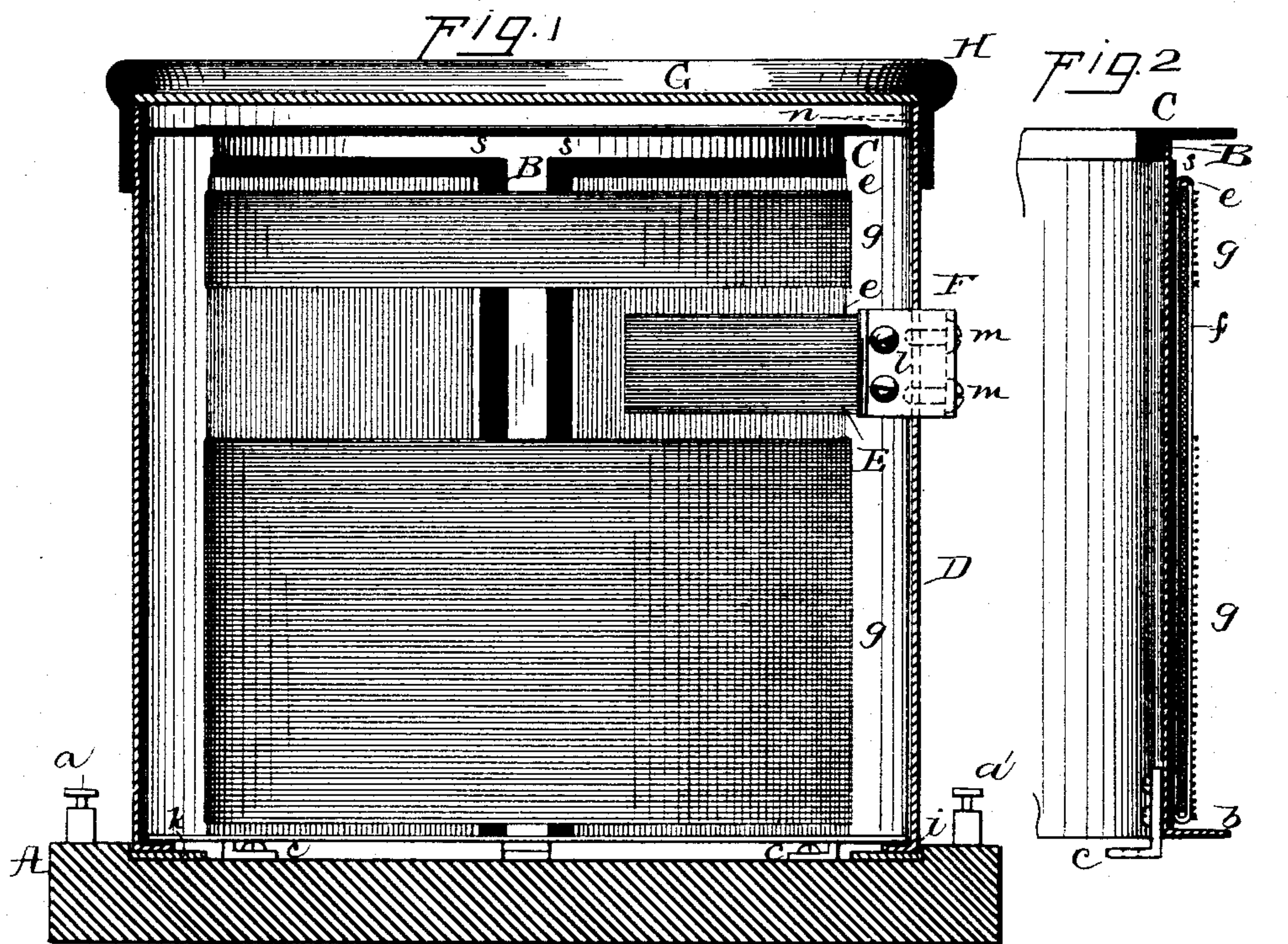
(No Model.)

C. WIRT.

ADJUSTABLE RESISTANCE FOR ELECTRICAL CIRCUITS.

No. 440,384.

Patented Nov. 11. 1890.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES WIRT, OF ORANGE, NEW JERSEY.

ADJUSTABLE RESISTANCE FOR ELECTRICAL CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 440,334, dated November 11, 1890.

Application filed November 26, 1888. Serial No. 291,907. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WIRT, of Orange, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Adjustable Resistances for Electrical Circuits, of which the following is a specification.

The object of my invention is to provide a simple, compact, cheap, effective, and readily-operated apparatus for varying the resistance of an electrical circuit; and my invention consists in the various novel devices and combinations of devices employed by me in accomplishing this object, as hereinafter set forth and claimed.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view of the apparatus, showing the inner cylinder in elevation and the base and outer cylinder in section; Fig. 2, a section of one side of the inner cylinder; Fig. 3, a top view of the apparatus, and Fig. 4 a diagram of the connections.

I employ two concentric cylinders or drums, one carrying resistance-coils, the other a contact device bearing thereon, such drums being movable relative to each other, whereby more or less of said coils are included in the circuit whose resistance is to be varied. I prefer that the inner drum shall be stationary and the outer one movable.

A is a base of insulating material, provided with binding-posts a a' . To this is fixed the inner drum. This consists of a metal cylinder B, with an outward flange b at its bottom, and with inward lugs or feet c c , through which it is secured to the base A by screws. Coils of insulated wire e e are wound longitudinally upon a sheet of insulating material—such as heavy paper or pasteboard f —and this is bent around the cylinder and secured by tight bindings of thread or other material g g . Between the pasteboard cylinder and the metal drum I prefer to place a thin insulating-covering s of varnished paper or equivalent material, gummed to the drum, whereby any possibility of contact between the wire and the drum is avoided. A flanged ring C of suitable material—such as hard rubber—fits in the top of the inner drum, and on the upper side of this I prefer to form a suitably-graduated scale h .

D is the outer turning-cylinder, preferably of metal, and having an internal flange i at its lower end, resting on the base. I may provide upon the base a metal ring k , on which the drum will bear.

At a suitable point I scrape off the insulation from the wire coils e , leaving the surface of the coils bare for a space extending entirely around the cylinder. Opposite this bared part, so as to rub thereon, is secured the relatively movable current-collector. This consists, preferably, of a wire brush E, held in a slotted head F of insulating material—such as hard rubber—by screws l . The head F is formed with a bend, and the brush being passed through a slot in the outer cylinder so as to rest on the coils the head fits the cylinder and is secured outside the same by screws m m . Above the scale-ring C a screw or pin n passes through a hole in cylinder D and serves as an index for said scale. A circular glass plate G is set on the top of the cylinder D, and a flanged ring H, preferably of hard rubber, is placed tightly over it and holds it in place. One end of the resistance-coil may be connected to binding-post a , the other being open, while the brush is connected to binding-post a' by a flexible conductor, so as to permit the revolution of the drum; or suitable sliding connections may be made to the drum, such drum being in this case itself connected with the brush. It will be seen that when the brush is in the position shown in Fig. 4 only a small part of the resistance-coils are in circuit between the binding-posts, and on turning the outer drum in the direction indicated by the arrow the brush sliding upon the coils includes more of them in the circuit, according to the distance it is moved. The extent of movement and consequent change of resistance will be indicated by the position of the index upon the scale, such scale being graduated according to the use to which the instrument is to be put. The external circuit, whose resistance is to be varied, is of course connected to the two binding-posts. The connections shown are such as are employed when the rheostat is used for directly varying the resistance of a circuit. It is evident that other suitable connections may be made for other purposes, as when the instrument is used in connection

with a potentiometer or other indicating apparatus.

What I claim is—

1. An adjustable resistance having, in combination, two relatively movable concentric cylinders, one having wires placed longitudinally upon it, the other carrying a contact-piece bearing directly upon said wires, substantially as set forth.
2. An adjustable resistance having, in combination, two relatively movable concentric cylinders, one having insulated wires wound longitudinally thereon, the surfaces of which are bare for a portion of their length, and the other carrying a contact-piece bearing on said bare portion, substantially as set forth.
3. An adjustable resistance having, in combination, two concentric cylinders, the inner one having wires wound longitudinally upon it, and the outer one carrying internally a contact-piece bearing on said wires, said outer cylinder being movable, substantially as set forth.
4. An adjustable resistance having, in combination, a metal cylinder having an insulating wrapping and wires wound longitudinally upon it, and a concentric cylinder carrying a contact-piece bearing upon said wires, said cylinders being relatively movable, substantially as set forth.
5. The resistance-coil consisting of a flexible sheet wound with wire and bent into a cylinder, substantially as set forth.
6. A resistance-coil consisting of a cylinder made of a bent sheet of paper with wire wound upon it longitudinally, substantially as set forth.
7. An adjustable resistance having, in combination, a metal cylinder, a sheet of paper wrapped with no wire, bent around said cylinder, and a concentric cylinder carrying a contact-piece bearing on said wire, said cylinders

being relatively movable, substantially as set forth.

8. A resistance-coil consisting of wire wound longitudinally upon a cylinder and a tight circumferential binding, substantially as set forth.

9. An adjustable resistance having, in combination, two concentric relatively-movable cylinders, one carrying longitudinally-wound coils, the other a contact-piece bearing on said coils, one of said cylinders having upon it a graduated scale and the other an index or pointer traveling over said scale, substantially as set forth.

10. An adjustable resistance having, in combination, two concentric cylinders, a fixed inner one carrying longitudinally-wound coils and a graduated scale, and a movable outer one carrying a contact-piece bearing on said coils and an index or pointer traveling over said scale, substantially as set forth.

11. An adjustable resistance having, in combination, an inner cylinder carrying longitudinally-wound coils and an outer cylinder carrying a brush bearing on said coils, said brush having a bent head extending through an aperture in said cylinder and secured outside the same, and said cylinders being relatively movable, substantially as set forth.

12. An adjustable resistance having, in combination, a cylinder, wires wound longitudinally on said cylinder, and a contact-piece bearing on said wires external to the cylinder, said cylinder and contact-piece being relatively movable, substantially as set forth.

This specification signed and witnessed this 12th day of October, 1888.

CHARLES WIRT.

Witnesses:

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