No. 706,555. Patented Aug. 12, 1902.

C. D. HASKINS.

ELECTRIC METER.

(Application filed Feb. 13, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

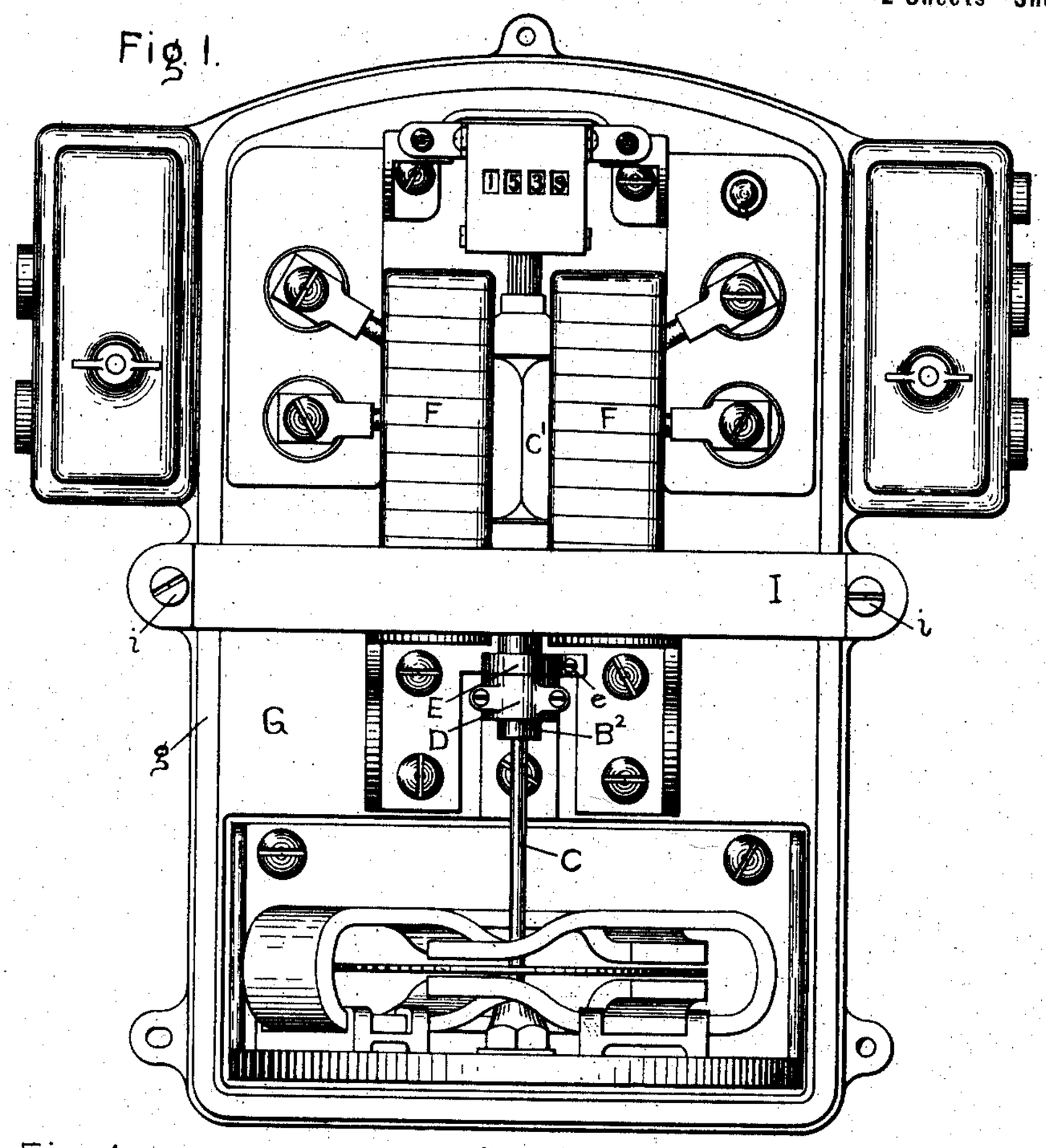


Fig. 4.

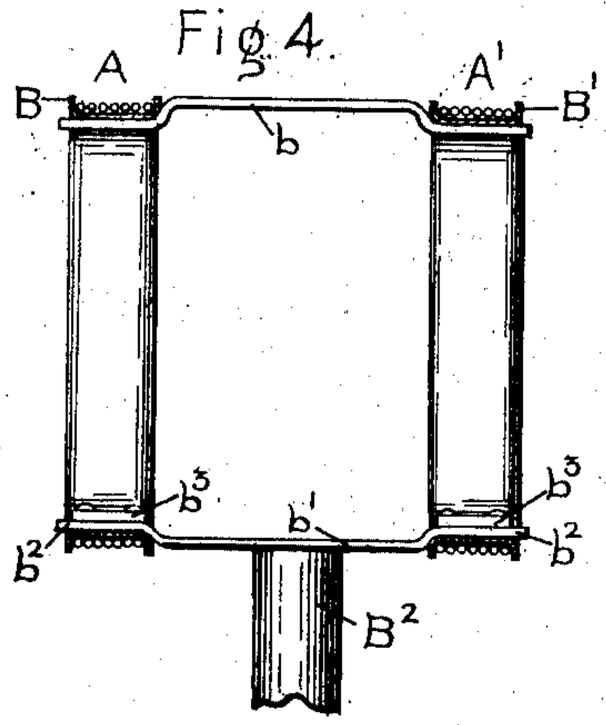


Fig. 2.

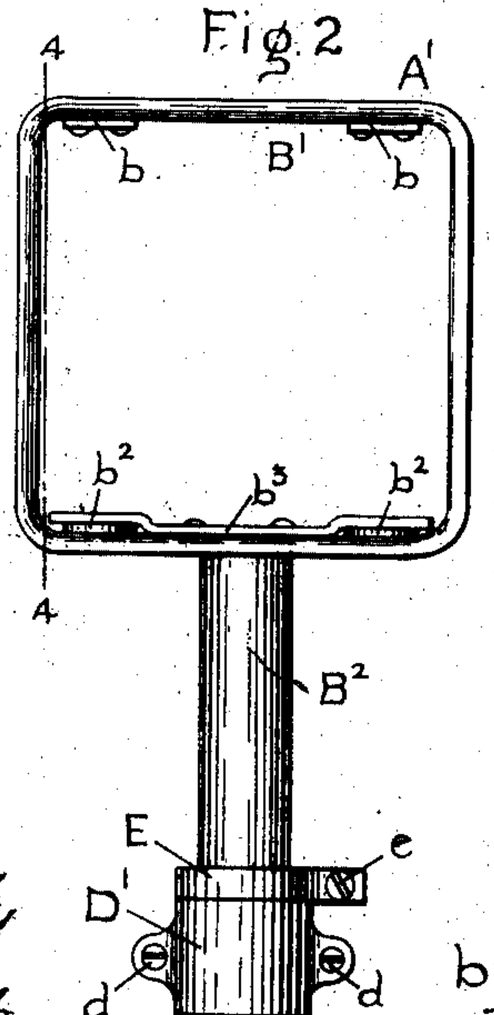
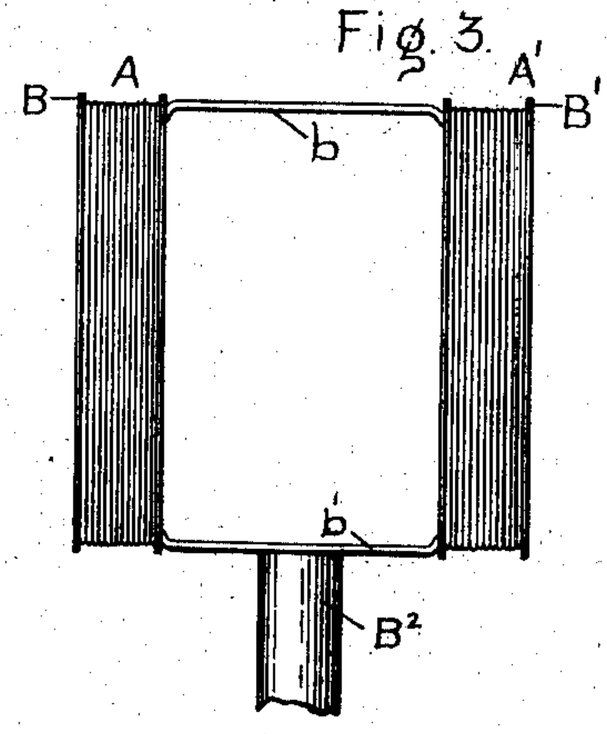


Fig. 3.



Witnesses.
Benjamin B. Hull,
Margaret E. Hoolby

Inventor:
Caryl D. Haskins.
by Albert G. Davis
Atty.

No. 706,555.

Patented Aug. 12, 1902.

C. D. HASKINS.

ELECTRIC METER.

(Application filed Feb. 13, 1901.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 5.

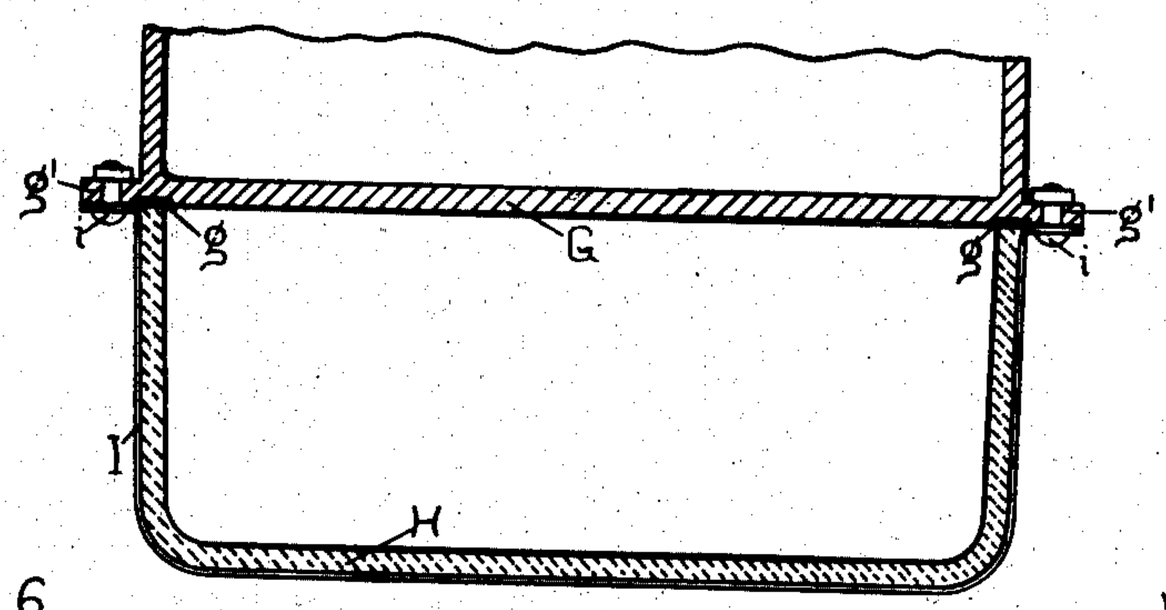


Fig. 6.

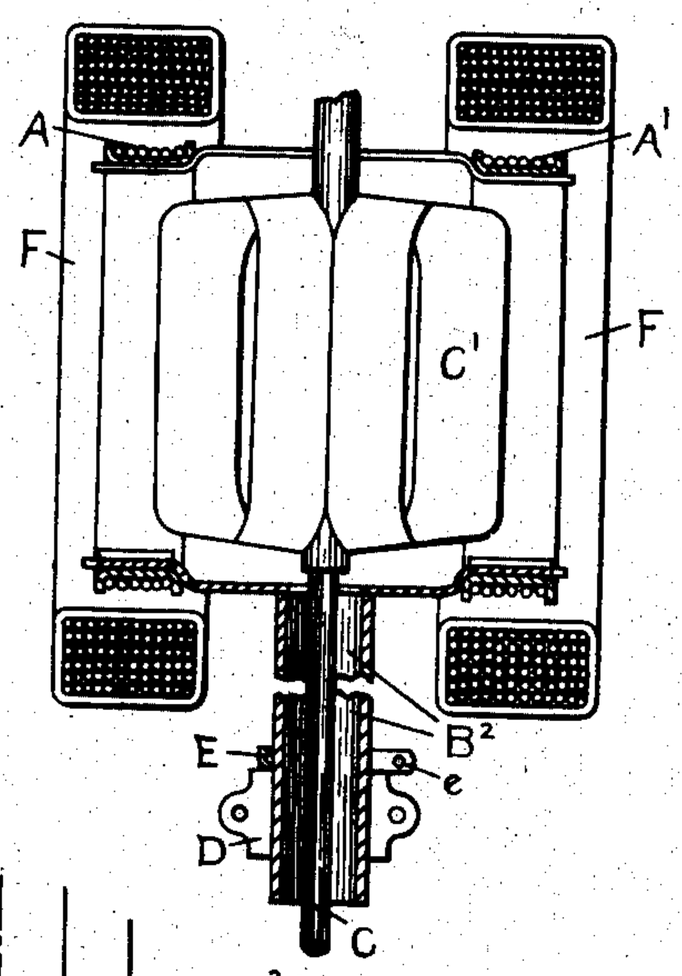


Fig. 7.

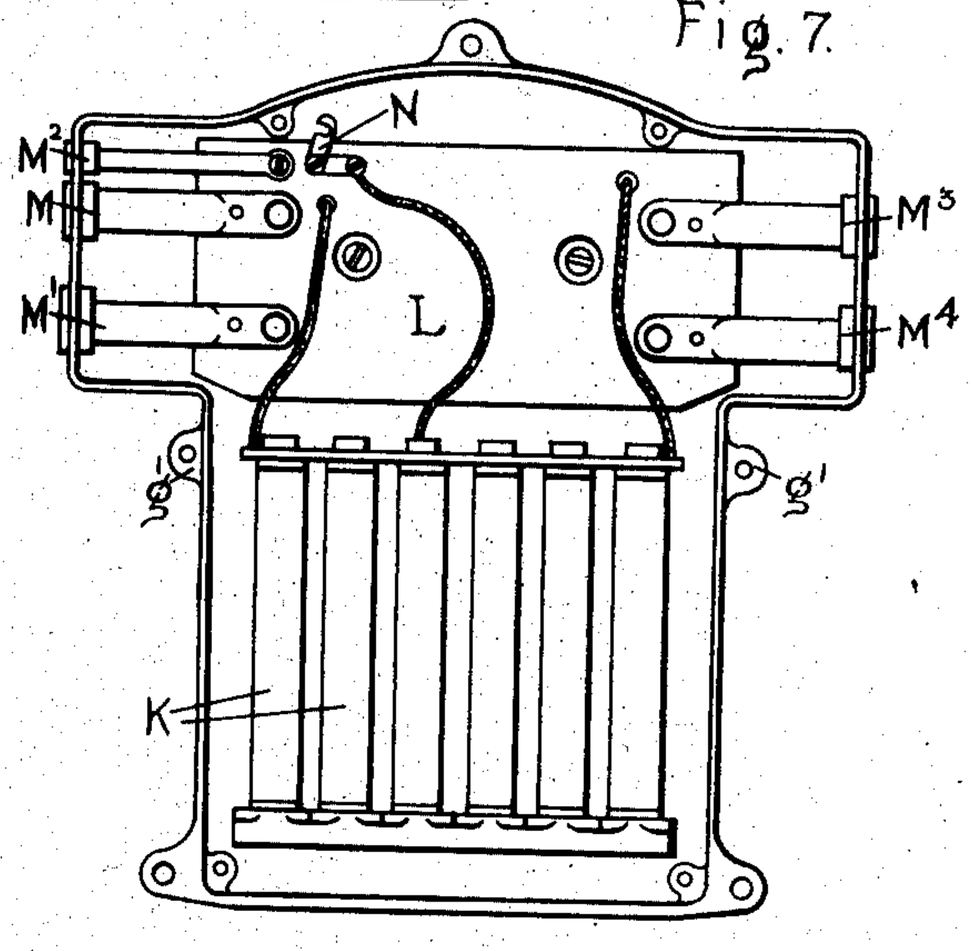
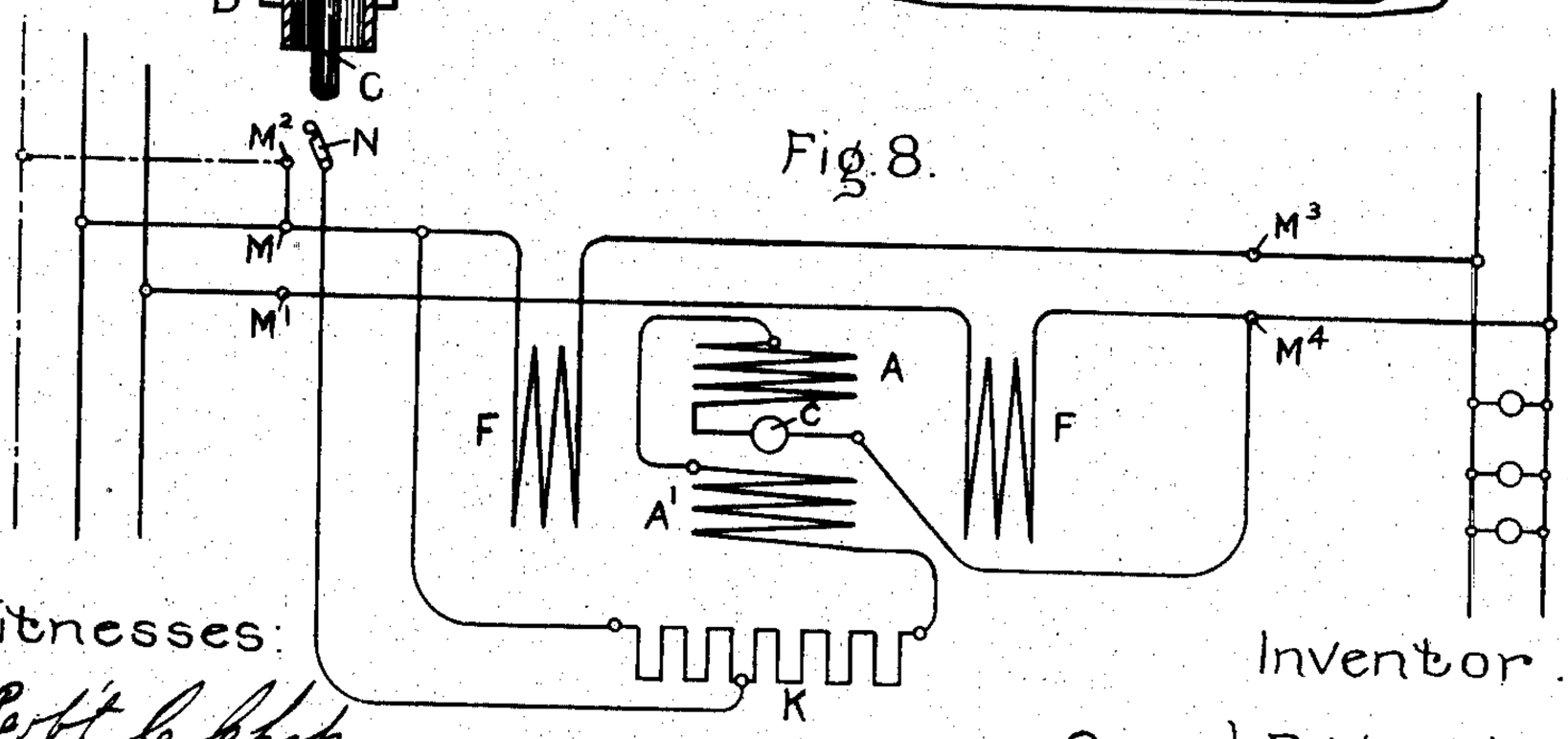


Fig. 8.



Witnesses:

Robt C Chapman

Benjamin B. Tuttle

Inventor.

Caryl D Haskins.

by Albert G. Davis

Atty

UNITED STATES PATENT OFFICE.

CARYL D. HASKINS, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC METER.

SPECIFICATION forming part of Letters Patent No. 706,555, dated August 12, 1902.

Application filed February 13, 1901. Serial No. 47,092. (No model.)

To all whom it may concern:

Be it known that I, CARYL D. HASKINS, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Electric Meters, (Case No. 1,452,) of which the following is a specification.

The present invention relates to electric wattmeters, particularly of the Thomson recording type, the object of the invention being to facilitate and render more accurate the adjustment of the meter to suit local conditions.

In a prior patent issued to me, No. 653,806, dated July 17, 1900, I described improvements in which an adjustable coil was employed to vary the torque on the armature, so as to provide a sufficient auxiliary torque to that exercised by the energy passing through the meter and in power sufficient to counterbalance the starting-friction, thus rendering the instrument better adapted for accurate work on small loads. My present invention is a refinement on the organization described in that patent and includes also means by which a portion of the armature-resistance may be shunted when desired to adapt it for accurate work on circuits of different voltage and for systems using either two or three wires for distribution. In carrying out these improvements I mount the starting-coil on a frame inclosing the armature. The coil is preferably divided into halves disposed one on each side of the armature-shaft. The frame is carried on a sleeve concentric with the armature-shaft and angularly adjustable with reference thereto, being retained in position by means of a suitable clamp. The rotation of the sleeve alters the relative positions of the starting-coils, so as to vary their compensating effect in the manner explained in my aforesaid patent.

The meter mechanism is protected by a glass case or cover held against the back or base plate of the instrument by one or more metallic bands passing over the cover and clamped to the back at each end or in any other suitable way.

In the accompanying drawings, Figure 1 is a front elevation of a Thomson recording-wattmeter embodying my improvements. Fig. 2 is a front elevation, partly in section, of the starting-coil, sleeve, and clamp on an enlarged scale. Fig. 3 is a side elevation of the starting-coil. Fig. 4 is a sectional elevation on the line 4 4, Fig. 2. Fig. 5 is a cross-section of the back plate and cover. Fig. 6 is a sectional elevation of the field-coils, starting-coils, and armature. Fig. 7 shows the back of the meter. Fig. 8 is a diagram of the circuit connection.

The starting-coil is made in sections A A′, wound on light trough-shaped hoops B B′, preferably rectangular and supported in parallel planes by cross-bars b at the top and a head b' at the bottom, having ears b^2, clamped to the hoops by strips b^3. The head b' is mounted transversely on one end of an upright sleeve B^2, concentric with the shaft C of the armature C′ and rotatable in a bearing D, having a cap D′, which can be clamped by screws d to retain the sleeve in position after it has been angularly adjusted. A split collar E embraces the sleeve and rests on the bearing, having a screw e by which it can be tightened to hold the sleeve after it has been vertically adjusted. The starting-coils A A′ are symmetrically arranged on each side of the armature and inside of the field-coils F. By giving the sleeve a partial rotation the planes of the starting-coils will be placed more or less transverse to those of the field-coils, so that the torque on the armature will be correspondingly varied and modulated by adjustment to suit any particular condition of installation. Thus the friction may be compensated to balance the varying degree of friction in different instruments and to balance also the jarring, vibration, and other interfering conditions of special locations.

Heretofore instruments have generally been protected by sheet-metal covers attached to the back or base plate by screws, spring-catches, or the like; but a glass cover cannot be readily attached in this way, owing to the liability of breakage of the lugs or other attachments on the cover. I provide a simple and yet safe and efficient means for holding a glass cover to the base-plate. The front of the base-plate G has a shallow groove g, preferably lined with felt or the like, against which fits the glass cover H. One or more

thin metallic bands I pass over the cover and are fastened at each end by screws *i*, entering ears *g'* on the base-plate, thereby securely holding the glass cover in place without danger of its breaking loose and without obstructing a clear view of the mechanism. The band or bands may be utilized to display the name, maker, patent-markings, &c., of the instrument. The base-plate is recessed in the rear to house the resistance-coils K of the potential circuit, in which the armature is connected, and the insulating-board L, on which are mounted the two sockets M M' for the line-terminals of a two-wire system, the socket M^2 for the additional line-terminal of a three-wire system, and the two sockets M^3 M^4 for the work-circuit terminals. One field-coil is connected across the sockets M M^3 and the other across the sockets M' M^4. One end of the resistance K is connected with the socket M and the other end with the socket M^4 through the starting-coils, which are in series with the armature. Sockets M and M^2 are connected, and a switch N provides for connecting them with a shunt around several of the resistance-coils when the meter is used on a low-voltage circuit or in a three-wire system.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electric motor-meter, a starting-coil wound in halves symmetrically disposed with relation to the armature-shaft, and means for adjusting said coil angularly around said shaft.

2. In an electric motor-meter, a starting-coil having a plurality of sections, and a sleeve concentric with the armature-shaft supporting said sections within, and symmetrically related to, the field-coils.

3. In an electric motor-meter, a sectional starting-coil, a rotatable sleeve concentric with the armature-shaft and carrying said coil, a bearing in which said sleeve is rotatable, and means for holding the sleeve and coils in any angular position with reference to the shaft.

4. In an electric motor-meter, a starting-coil, a rotatable sleeve concentric with the armature-shaft and carrying said coil, and a clamp between the sleeve and its support.

5. In an electric motor-meter, a starting-coil wound in halves on trough-shaped hoops located on each side of the armature.

6. In an electric motor-meter, the combination with a sleeve, of a head mounted transversely thereon, and two hoops carried by said head in parallel planes symmetrically disposed on each side of the axis of the sleeve.

7. In an electric motor-meter, the combination with the armature-resistance, of a controllable shunt around part of said resistance.

8. In an electric motor-meter, the combination with two work-circuit terminals and two line-wire terminals, of a third line-wire terminal, an armature-resistance, a shunt around part of said resistance, and means for connecting said shunt with the third line-terminal.

In witness whereof I have hereunto set my hand this 11th day of February, 1901.

CARYL D. HASKINS.

Witnesses:
BENJAMIN B. HULL,
MARGARET E. WOOLLEY.