Feb. 20, 1934. G. G. WAITE ET AL 1,947,816

RECORDING DEVICE FOR METERS

Filed March 24, 1933

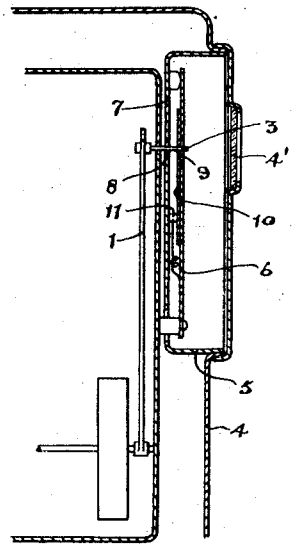


Fig. 1.

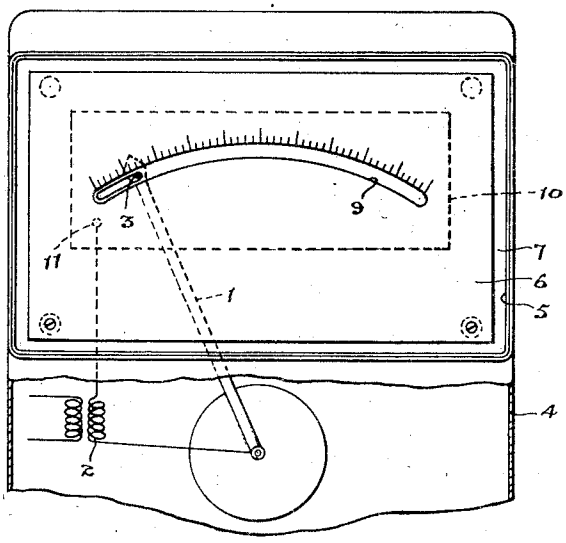


Fig. 2.

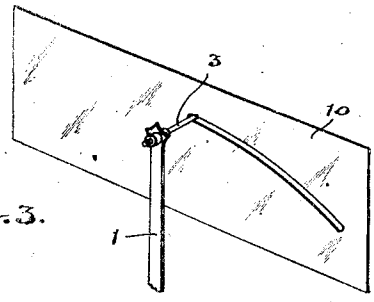


Fig. 3.

Inventors.
Griffin G Waite.
George W. Lawrence.
by H. S. Dennison
atty.

Patented Feb. 20, 1934 1,947,816

UNITED STATES PATENT OFFICE

1,947,816

RECORDING DEVICE FOR METERS

Griffin G. Waite and George W. Lowrence, Toronto, Ontario, Canada, assignors to Sangamo Company Limited, Toronto, Ontario, Canada

Application March 24, 1933. Serial No. 662,429

5 Claims. (Cl. 234—1.5)

The principal objects of this invention are to devise means for indelibly recording the maximum travel of the indicating member of a meter in such a manner as to eliminate resistance to the movement of the delicately adjusted indicating member and to provide an arrangement which will permit the easy and simple insertion and removal of record cards to and from the meter.

The principal feature of the invention consists in the novel arrangement of a thin metal foil in the path of movement of an electrode whereby the electrode penetrates the foil and is free from contact with any retarding element and fuses the foil to form a clear pathway therein as it advances in its recording movement.

Figure 1 is a vertical sectional view of a portion of a meter showing the application of the invention.

Figure 2 is an elevational view of the structure shown in Figure 1 with the cover removed and a portion of the casing broken away.

Figure 3 is a perspective view of the indicator finger and record foil showing the recording slot.

Numerous forms of metering instruments and particularly electric meters are extremely delicate in their indicating elements and it has been ascertained that there is an appreciable element of error in the indication where recording means are provided, due to frictional contact between the record sheet and the recording member. This invention effects the elimination of such error in a practical and reliable manner.

As illustrated in the accompanying drawing the indicating arm 1, which is operated by the meter elements responsive to the quantities or forces being measured, is electrically connected with a source of electrical energy, here illustrated in the form of a transformer 2. Mounted upon the arm 1 adjacent to its free extremity is a stylus 3, preferably in the form of a fine metallic or graphite pencil.

The case 4 of the meter is formed with a recess 5 adapted to receive the record card 6 and the inner wall 7 of the recess is provided with a slot 8, preferably of arc-shape concentric with the axis of rotation of the indicator arm and through which the stylus 3 extends. A suitable cover 4' of transparent material may be arranged to close and seal the card recess.

The record card 6 is provided with a recess or slot 9, coinciding with the slot 8 in the case and a sheet 10 of thin metal foil, preferably silver, is secured to the back of the card spanning the recess or slot 9. The face of the card is preferably printed with a suitable indicator scale which provides the means of indicating the measurement in accordance with the position of the arm 1.

A terminal contact 11 is arranged in the recess 5 to engage with the metal foil on the card and said terminal is electrically connected with the source of power so that an electric circuit is closed when the stylus 3 engages the foil. The closing of the circuit causes the fusing of the foil and the stylus penetrates through the foil intermediate of the width of the slot 9 in the card. The stylus burns a hole greater than its own diameter through the foil and the circuit is immediately broken. As the arm 1 moves in its arc-shaped path under the influence of the metering device the stylus engages one edge of the hole originally burned on the insertion of the card and as it advances it burns its way edgewise through the foil entirely through the arcing of the current flowing through the stylus circuit and there is no actual contact frictionally or otherwise with either the foil or any surface. The result achieved is that there is no resistance to the indicating movement of the arm 1 and an absolutely true record of the movement of the indicator arm is provided by the narrow slot which is burned in the foil adjacent to the scale marked on the card.

The applicants are aware that attempts have been made to produce records of the operations of meter indicator arms by fusing metal foil mounted on some other substance, in the path of travel by the contact of an electrode, but the present invention differs from such efforts in that the electrode penetrates a foil which is unsupported throughout the line of travel of said electrode and there is an absence of frictional or other resistance to its movement.

It will be understood that the construction of the record card, the stylus or other parts may be varied considerably without departing from the principal feature as herein enunciated.

What we claim as our invention is:

1. In a recording device for meters, a member operated by the meter in response to the value measured, a sheet of metal foil arranged adjacent to said member, an electrode carried by said meter operated member and penetrating said metal foil and fusing an advance path through the latter to permit unobstructed movement of the meter operated member, said electrode being free of frictional contact with any retarding element.

2. In a recording device for meters the combi-

nation with a member operated by the meter in response to the value measured and carrying an electrode, of a record member presenting a thin strip composed solely of metal foil in the path transversely of the electrode, said electrode being extended unobstructedly through said metal foil and fusing the pure metal foil in advance to permit unobstructed advance movement of the meter operated member.

3. In a recording device for meters, the combination with a member operated by the meter in response to the value measured and carrying an electrode, of a record member having a recess or slot corresponding with the path of travel of the electrode, and a sheet composed solely of fusible metal foil spanning said recess or slot, said electrode being extended completely and unobstructedly through said fusible foil and fusing an advance path through the foil to permit unobstructed movement of the meter operated member.

4. A meter having a recess adapted to hold a record card, a member operated by the meter to travel across said recess and having an electrode, a card removably inserted in said recess having a slot conforming to the path of travel of said meter-operated member, and a sheet composed solely of fusible metal foil secured to said card and removable therewith and spanning said slot, said electrode being extended unobstructedly through said fusible metal sheet and fusing an advance path therein to permit the unrestricted advance of the meter operated member.

5. In a recording device for electric meters, an indicating arm operated by the meter and carrying an electrode, a record card to be temporarily mounted in said meter and to be thereafter removed and retained as a record, said card having a scale thereon and a slot adjacent to the scale adapted to receive said electrode, and a sheet of metal foil spanning said slot and secured to said card as a permanent part thereof and adapted to be penetrated by said electrode and fused thereby in its travel in response to the action of the meter-indicating arm, whereby the value represented by the length of the fused path will be indicated on the permanent record by the presence of the said scale.

GRIFFIN G. WAITE.
GEORGE W. LAWRENCE.