March 16, 1943. P. G. ADAMS 2,313,908

LOCK TYPE RESET DEVICE

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Fig. 1.

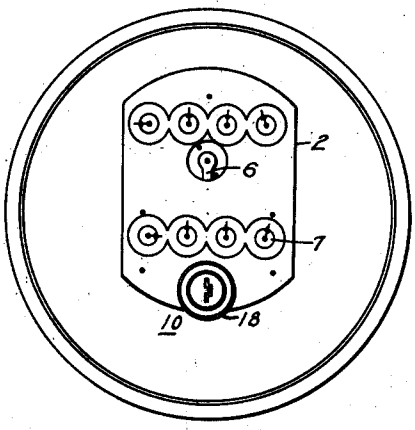


Fig. 2.

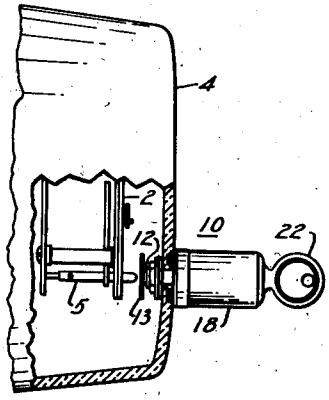


Fig. 3.

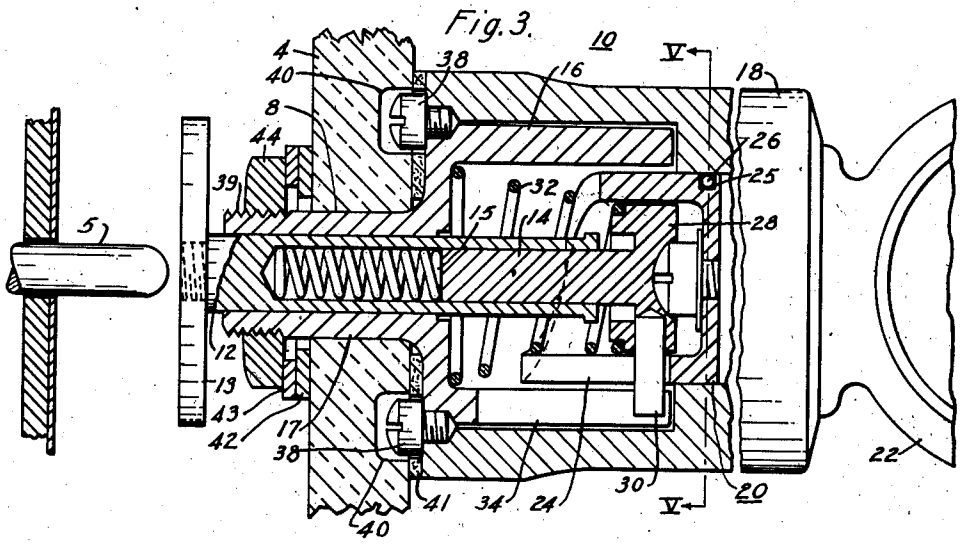
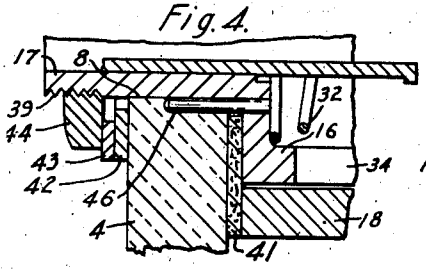


Fig. 4.



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Fig. 5.

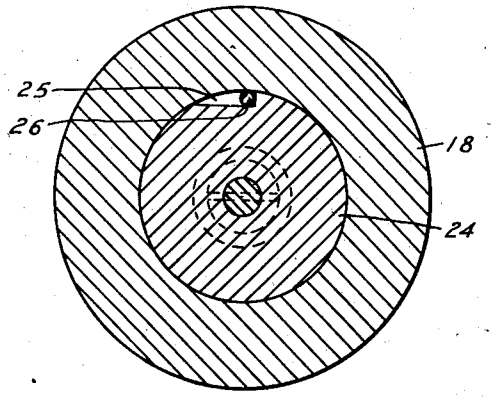
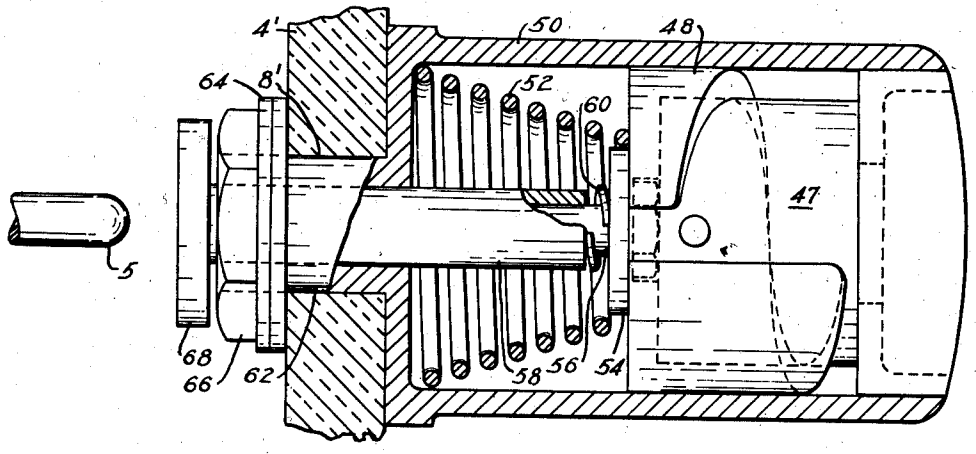


Fig. 6.



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2,313,908

LOCK TYPE RESET DEVICE

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Application May 7, 1941, Serial No. 392,275

5 Claims. (Cl. 171—34)

The present invention relates to reset devices and it has particular relation to such devices for operating the reset mechanism of watthour meter registers of the maximum demand type.

In cumulative maximum demand registers such as those of the motor-driven reset type, the reset mechanism is generally brought into operation by manually depressing a control plunger. The operation of this plunger results in interconnecting the maximum demand indicator in the cumulative dials and substantially simultaneously connects these devices to be driven by the reset motor. At the end of the resetting operation these connections are automatically broken and the apparatus is in condition for normal operation.

According to the present invention a lock-controlled device is mounted on the casing or cover of the meter upon which the maximum demand register is mounted ,so that operation of the device from outside the casing causes the reset plunger to be actuated. The lock is preferably such that a complete revolution of a key therein causes an operating member extending through the meter cover to move inwardly for this purpose. This actuating member is biased to an outward position so that it will immediately return to its normal position and it is preferably resiliently constructed so as not to force the register plunger past its normal innermost position. The lock is preferably arranged for movement in only one direction and is such that the key cannot be withdrawn prior to completion of a complete revolution.

It is accordingly an object of the present invention to provide a novel and improved device for actuating the reset mechanism of an electrical meter from outside the cover thereof.

Another object of the invention is to provide a device having a resilient member for actuating the resetting plunger of a maximum demand watthour meter in response to the rotation of a key in a lock outside the meter casing.

A further object of the invention is to provide a maximum demand reset actuating device in which the possibility of damaging the meter assembly or of carelessly failing to complete the resetting operation are substantially eliminated.

Other objects and advantages of the invention will appear from the following detailed description read in conjunction with the accompanying drawings in which:

Figure 1 is an elevational view of an electrical watthour meter assembly embodying the present invention,

Fig. 2 is a side view partly in section and with parts broken away of the apparatus of Fig. 1, showing a key in operating position therein,

Fig. 3 is an enlarged side view, partly in section and with parts broken away, of the reset operating device shown in Figs. 1 and 2,

Fig. 4 is a sectional view similar to a portion of Fig. 3 of a modified form of the apparatus,

Fig. 5 is a sectional view taken along the line V—V of Fig. 3, and

Fig. 6 is a view similar to Fig. 3 of a modified form of the invention.

Referring to Figs. 1 and 2, there is shown a meter assembly including a maximum demand type register **2** enclosed within a casing including a glass cover member **4**. The register **2** may be a motor reset type cumulative maximum demand meter such as that disclosed in the U. S. patent application of Robert H. Lewis, et al., Serial No. 217,024, filed July 1, 1938. This type of register includes a reset plunger **5** which, upon being momentary depressed, acts to couple a maximum demand indicator **6** and cumulative demand register **7** while connecting these to be driven by a reset motor. At the end of the resetting operation the resetting motor is automatically disconnected and the connection between the maximum demand indicator **6** and the cumulative register dial **7** is simultaneously broken.

It will be understood that the glass cover **4** is secured to the casing of the watthour meter in a manner well known in the art and that a sealing gasket is preferably disposed therebetween.

An opening **8** is provided in the cover **4** adjacent to the end of the reset plunger **5** and a reset device **10**, in accordance with the present invention, is secured thereto with an operating plunger **12** extending through the opening. A reset button **13** is threaded to the end of this plunger **12** so that any inward motion of the plunger will cause the button to depress the register reset plunger **5**.

As is best shown in Fig. 3, the plunger **12** is of hollow construction along the main portion of its length extending to its outer end and has an operating stud **14** extending into it. A spiral spring **15** is likewise disposed within the plunger to resiliently connect it with the end of the stud **14**. This plunger, in addition, is seated within a base or inner barrel member **16** which includes a sleeve portion **17** extending through the opening **8** in the meter cover. An outer barrel or housing **18** for the reset device is disposed about

the inner barrel 16 and encloses a lock member at its outer end as at 20.

The lock member at 20 is not shown in detail in the drawing because it may be any of several known constructions. The only requirements are that it be operable upon a complete revolution of the key 22 to cause a cam barrel member 24 to rotate through a single revolution. The lock is also preferably such that a movement of the key through an angle of approximately 10° from its initial position will prevent its being withdrawn therefrom until it is revolved through a complete revolution. As is best shown in Fig. 5, the cam shaped barrel 24 is preferably slotted at 25 adjacent to the inner surface of the housing 18. A pin member 26 is disposed within this opening to form a ratchet device of a well known type whereby the cam barrel can be rotated only in a counterclockwise direction.

The stud 14 is connected to a base member 28 which in turn includes a radially projecting pin 30. A spiral spring 32 is disposed with the device between the surface of the inner barrel 16 and the base member 28 to bias the member outwardly against the cam surface of the barrel 24 so that the pin 30 will ride thereon during its rotation. The inner barrel 16 includes an axial groove 34 into which the end of the pin 30 extends so that the base 28 and stud 14 will receive only an axial movement from the cam shaped barrel 24 and will not be rotated thereby.

The inner barrel 16 and the housing 18 are secured together by diametrically displaced machine screws 38 and the inner end of the tubular portion of the barrel member is preferably screw threaded as indicated at 39. The outer surface of the glass cover 4 is recessed or grooved at 40 to accommodate the heads of the machine screws 38 while a resilient gasket 41 is placed between the outer surface of the cover and the inner end of the housing and barrel. An annular gasket 42 and washer 43 are disposed against the inner surface of the cover about an end of the tubular member 17 while a nut 44 is threaded thereto to secure the entire assembly in place on the cover.

The purpose of the machine screws 38 is to prevent any rotation of the device upon the cover during the operation of the lock and it will be evident that other methods of accomplishing this result might be employed. In Fig. 4, for example, this is done by grooving a portion of the opening 8 about the tubular portion 17 of the inner barrel so as to permit a pin 46 to be inserted therein.

From the above description, it is believed that the installation of the device will be evident. It will appear that the assembly may be completed except for the reset button 13 and the nut 44 with its gasket and washer prior to the apparatus being positioned on the cover. After the device is disposed about the opening, it is only necessary to apply these particular parts and secure the nut 44 in place. Obviously the apparatus when secured in this manner cannot be removed from outside the casing.

After such installation, the cover may be assembled upon the meter base in the usual manner and the device is ready for operation. In making his monthly rounds, the meter reader merely inserts the key 22 in the lock and rotates it through a complete revolution to perform the reset operation. This action causes the cam shaped barrel 24 to rotate through a complete revolution thus pushing the stud 14 inwardly to move the operating plunger 12 into engagement with the reset plunger 13. Upon the plunger 13 being fully depressed, further movement of the stud 14 will be taken up by the spiral spring 15 so that no severe stress will be exerted on the register or the cover. The importance of this feature will appear when it is realized that the register is of delicate construction while the cover will generally be of glass.

In Fig. 6 a modified form of the invention is shown. In this case rotation of the key in the lock at 47 causes an inner barrel member 48 to reciprocate within a housing member 50. This barrel member is biased outwardly through a spring 52 which is compressed between it and the inner surface of the housing 50 while a base member 54 carrying a stud 56 is secured to the inner end of the barrel. This stud 56 extends through a cylindrical opening in an operating tube or plunger 58 while a split ring type spring 60 provides a resilient connection between these two members.

The housing 50 includes a tubular portion 62 which extends through an opening 8' in the cover 4' in a manner similar to that previously described. A washer assembly 64 and nut 66 are employed for securing the device in place on the cover while the operating plunger 58 extends to the inside of the cover and has a reset button 68 on the end thereof.

This modified device is arranged to operate a meter plunger 5 in the same manner as that previously described and preferably the lock is of a type which may be rotated in only a single direction. It will appear that the split ring spring member 60 will take up any movement of the base member 54 after the plunger 5 has reached its innermost portion to afford protection similar to that resulting from the first embodiment.

From the above description it will be evident that the present invention provides a simple and reliable device for actuating the reset mechanism of a maximum demand meter. Since a complete revolution of the lock is required before the key can be withdrawn, the possibility that the meter reader will carelessly fail to complete the resetting operation is eliminated. The use of the resilient connection between the lock and the operating plunger insures that no damage will be done to the register despite differences in mounting positions which frequently result from such factors as variations in dimensions of the cover glass and of the gasket disposed between the cover and the meter base.

It will be evident that various modifications of the apparatus shown and described will appear to those skilled in the art and for that reason, it is intended that the invention shall be limited only by the appended claims interpreted in view of the prior art.

I claim as my invention:

1. In combination with a register including a plunger and a resetting mechanism operable in response to the depression of the plunger, a cover disposed about said register and having an opening therein, operating means movable through said opening and including a longitudinally resilient member for operating said plunger, and a lock operable from outside said casing to move said longitudinally resilient member to resiliently depress said plunger.

2. In combination with an electrical meter including a demand type register having an outwardly biased plunger and a resetting mechanism

operable in response to a momentary depression of the plunger, a casing disposed about said register and having an opening therein, an operating member including axially resilient means extending through said opening, means for resiliently biasing said operating member outwardly at a position adjacent said plunger, a lock operable from outside said casing in response to a rotary movement for moving said operating member inwardly against its said biasing means to depress said plunger, and means for supporting said operating member and said lock on said casing.

3. In combination with an electrical meter including a demand type register having a plunger and a resetting mechanism operable in response to the depression of the plunger, a casing disposed about said register and having an opening therein, an operating member including axially resilient means extending through said opening to a position adjacent said plunger, a lock responsive to a complete revolution of a key outside of said casing for reciprocally moving said operating means to depress said plunger, a housing for enclosing said operating member and said lock to prevent unauthorized operation thereof, and means accessible from the inside only of said casing for securing said operating member, lock and housing to said casing.

4. In combination with an electrical meter including a demand type register having an outwardly biased plunger and a resetting mechanism operable in response to a momentary depression of the plunger, a casing disposed about said register and having an opening therein, an operating device including an axially resilient portion extending through said opening, means for resiliently biasing said operating device outwardly with its inner end adjacent the end of said plunger, a lock operable from outside said casing in response to a rotary movement for moving said operating device inwardly against its said biasing means to depress said plunger, a housing for enclosing said operating device, biasing means and lock to prevent unauthorized operation thereof, means accessible from the inside only of said casing for securing said housing to said casing, and means for preventing rotation of said housing relative to said casing.

5. In combination with an electrical meter including a demand type register having a plunger and a resetting mechanism operable in response to the depression of the plunger, a cover disposed about said register and having an opening therein, a longitudinally resilient operating device slidable through said opening to operate said plunger, and means including a lock operable from outside said casing for reciprocally moving said operating device into and out of resilient operating engagement in response to a complete rotation of a key therein.

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