Obsolete 1930

Westinghouse

Type DR Demand Attachment

For A-C. Watthour Meters

INSTRUCTIONS

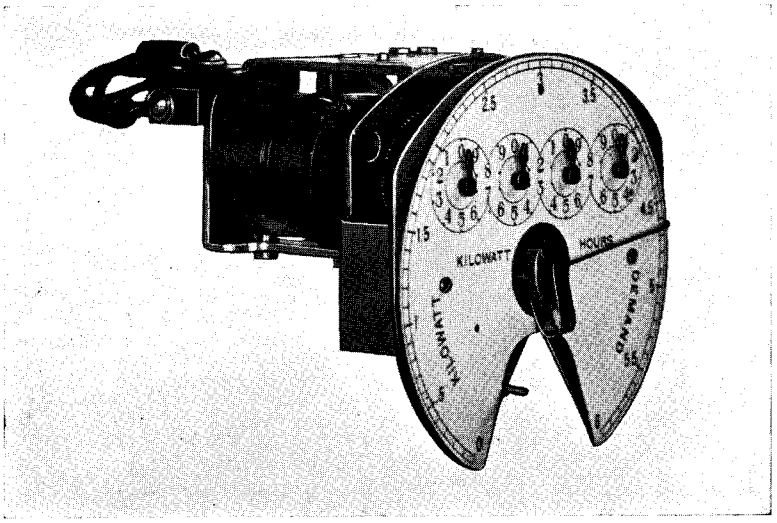

FIG. 1—FRONT VIEW, METER COMPLETE

INTRODUCTORY

The new demand register for type OB watthour meters introduces a new operating principle and incorporates a number of improvements and refinements. The sub-synchronous operating motor has been considerably refined and improved over previous forms and the reset mechanism which previously operated on the gravity principle is now operated by means of a spring. The improved synchronous motor not only measures the time interval but at the same time stores energy throughout the entire period by winding up the operating spring. At the end of the time interval the spring is released, restoring the demand mechanism to the zero position without demeshing any gears.

It will be understood therefore that this demand attachment is quite different in its operation from any previous products of Westinghouse or other makes.

PRINCIPLE OF OPERATION

Referring to the schematic diagram it will be noted that the demand pointer carried by shaft No. 12-A is advanced by a "finger" or "pusher" F which is driven by the watthour meter disc through a train of gears marked 3, 4, 5, 9, 10, 11. These gears are in addition to the usual watthour register gears 13, 14, 15, 16. The finger or pusher is carried on shaft No. 11. As the watthour meter disc rotates, the maximum demand pointer on shaft No. 12-A is advanced until the demand period time has elapsed. The pointer is friction coupled to its shaft in such a way as to retain its maximum position until it is restored to zero through the manual action of the meter reader. Subsequent higher demands will advance the pointer further indicating maximum demand in the usual way.

At the end of each time interval as measured by the synchronous motor, the spring operated reset mechanism on shaft No. 6 is released and drives No. 11 shaft instantly backward moving the pusher back to the zero position.

The synchronous motor not only serves as the timing device but constantly winds the reset spring throughout the entire time interval. This slow winding of the spring accounts for the very light and uniform load on the motor.

OPERATION

In detail, the action is as follows: As shown in the diagram, the shaft No. 6 is directly geared to the synchronous motor, which therefore winds the inner turn of the spring. By means of a cross pin through this shaft, it drives a cam which is loosely mounted on the shaft. This cam when driven by this cross pin makes one revolution and then engages and trips the odd-shaped escapement plate marked No. 7 on the diagram. This plate is so shaped that it acts as a trigger and allows the outer end of the spring to instantly unwind one turn only, carrying with it the circular disc to which the outer end of the spring is attached. This disc in turning rotates the gear sector on shaft No. 8. This gear sector drives shaft No. 11 in the reverse direction from that in which it was advanced by the meter train 3, 4, 5, 9, 10. Thus the finger F is periodically restored to zero.

It will be noted that the gear on shaft No. 11 which is driven by the meter disc train is loosely coupled to shaft No. 11 and can drive the shaft gear sector and the push finger F forward through the friction effect of the spring washer.

With the above outline as a guide, the action can best be understood by seeing the mechanism itself.

ACCURACY

While the meter is advancing the demand pointer, which it does of course only when there has not been a previous higher demand recorded, the accuracy of the meter is affected less than 1% at $\frac{1}{20}$ of full load. This improvement in performance over previous demand attachments is due in part to better construction of the gearing mechanism and to the fact that the stored energy required for resetting is not furnished by the meter element but is derived as explained above, from the motor. Due to the clutch being at a very slow speed point, in relation to the disc speed, its dragging effect becomes negligible. The means employed in this new register for the reset operation has made it possible to simplify the gearing and eliminate many parts, thus contributing to the improvement in performance.

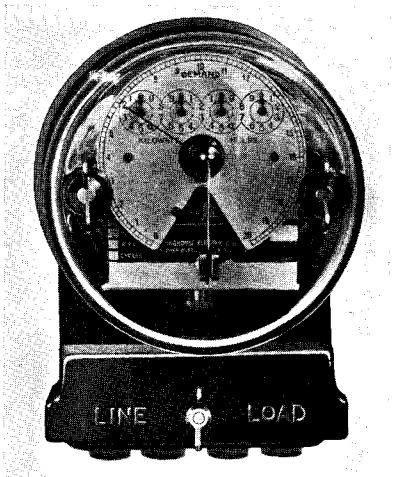

FIG. 2—TYPE OB WATTHOUR METER EQUIPPED WITH DEMAND ATTACHMENT

Should the timing motor stop while the demand attachment is in service, the demand pointer will be advanced to the full scale position and the friction driving washer will then slip to allow the meter element to continue to operate. Under this condition the meter is subject to a small error due to the extra torque required to overcome this friction. However, this error is much smaller than that caused by similar conditions in former demand mechanisms. Except at very light loads, this condition does not have any material effect on the meter accuracy. It is very seldom that the meter would be operating at light load when the demand pointer remains at the full scale position.

COVER AND RESET DEVICE

A designed improvement has been made in the externally operated reset mechanism. The resetting is done by merely pushing the pointer backwards by means of the knob projecting through the cover without necessity of demeshing the gears. The method of securing the reset device is similar to the construction previously used in the type OA demand attachments.

INTERCHANGEABLE MOUNTING

The type OB demand attachment complete is exactly interchangeable in its mounting with the mounting and location of the ordinary register. Thus the ordinary register can be replaced with a new demand attachment without loss of time.

The special glass cover complete with reset device is somewhat deeper than the usual cover, in order to provide room for the demand register.

These attachments with an adapter bracket can be used to convert standard OA watthour meters into demand meters.

ADJUSTMENTS

The zero adjustment is controlled by the zero set screw as shown in the diagram. Ordinarily, there are no further adjustments required. The upkeep, periodic cleaning, etc. is no different from that maintained in ordinary watthour meters and registers by operating companies.

The motor bearings should be lubricated with pure vaseline at intervals of about two years, more or less according to location and service conditions.

Before leaving a demand meter after installing a demand register or after inspecting, make sure that arm on No. 7 shaft rests on the projection of the cam as shown in the enlarged view sketch at the top. In other words, inspect the register to see that arm on No. 7 shaft has not been released from the correct position by hand.

The friction adjustment for the demand pointer, as indicated at "D" on the diagram, is obtained by the spring tension adjusting screw. The pointer friction should be between the values of 17 and 22 millimeter-grams.

Referring to the diagram, the clutch tension adjustment on No. 11 shaft is set to give between 45 and 55 millimeter-grams friction on the push-finger F by means of the two nuts compressing the spring washer which bears against the friction washer.

Friction may be measured in the same way as torque measurements are made by means of a small spring balance, noting the extension or torque required to overcome the friction.

A watthour meter should be recalibrated after a standard register is replaced by a demand register.

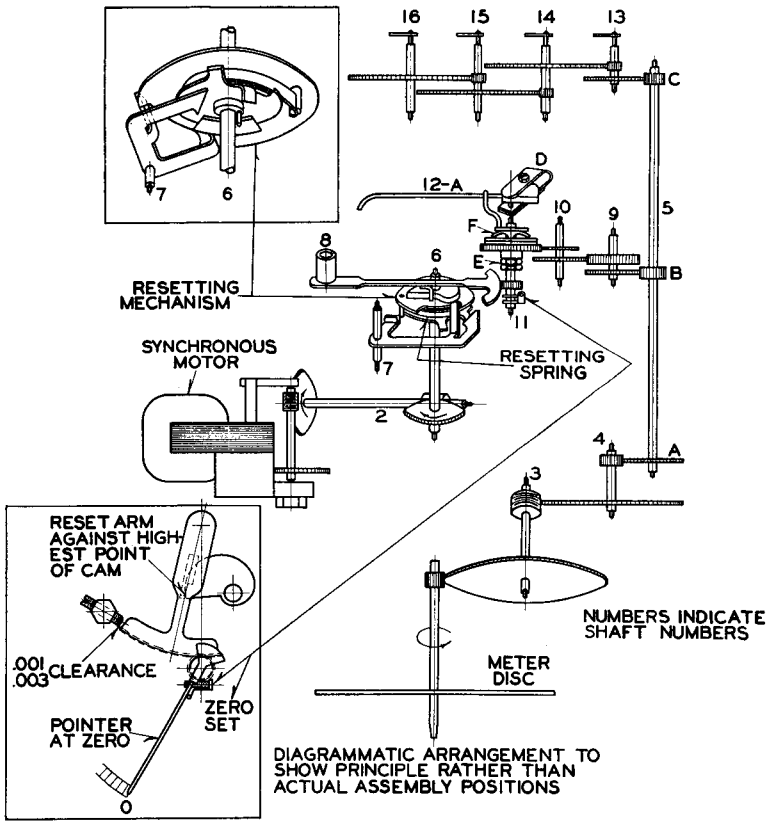

FIG. 3—PRINCIPLE OF OPERATION OF TYPE DR DEMAND ATTACHMENT

Westinghouse Electric & Manufacturing Company

Newark Works **Newark, N. J.**

Printed in U.S.A.