April 8, 1958 F. W. TRUESDELL 2,830,269

ELECTRIC METERING AND CONTROL DEVICE

Filed March 17, 1954 2 Sheets-Sheet 1

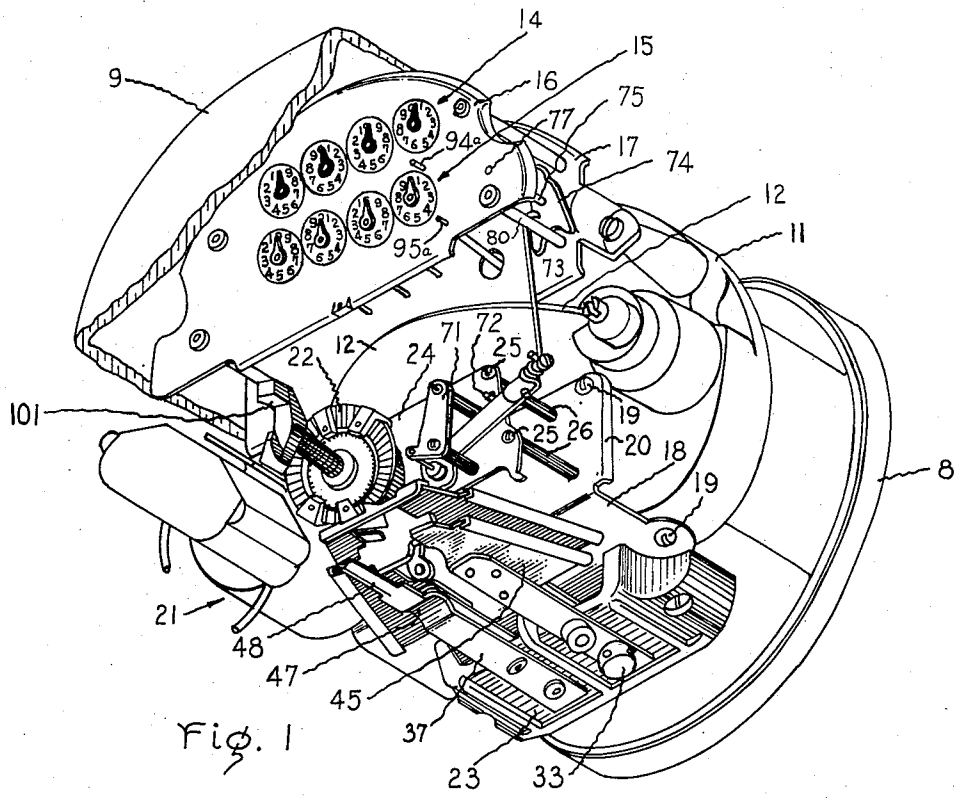


Fig. 1

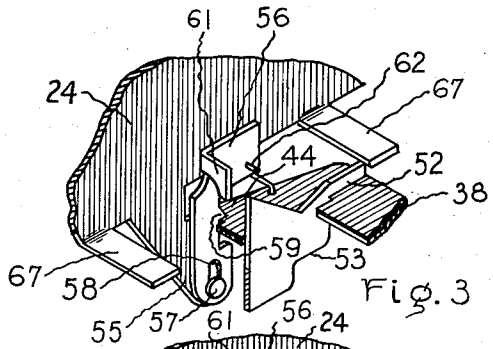


Fig. 3

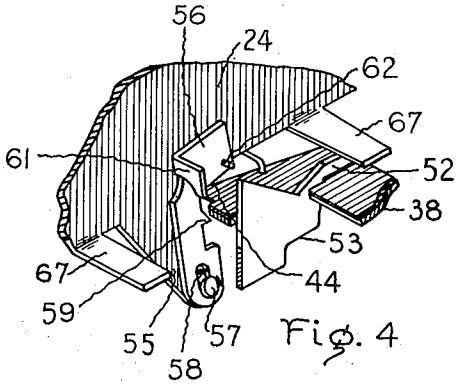


Fig. 4

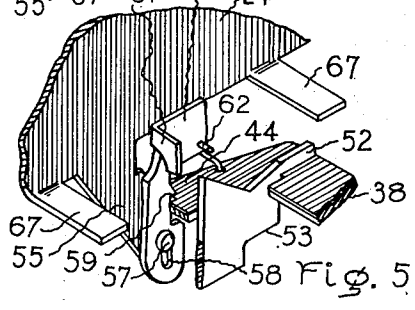


Fig. 5

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ELECTRIC METERING AND CONTROL DEVICE

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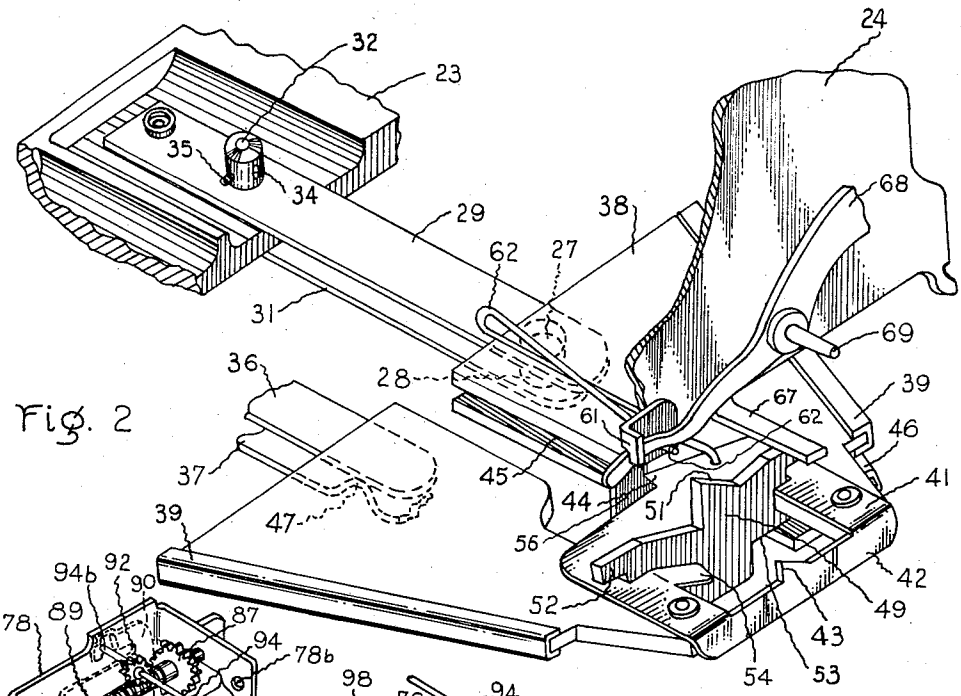


Fig. 2

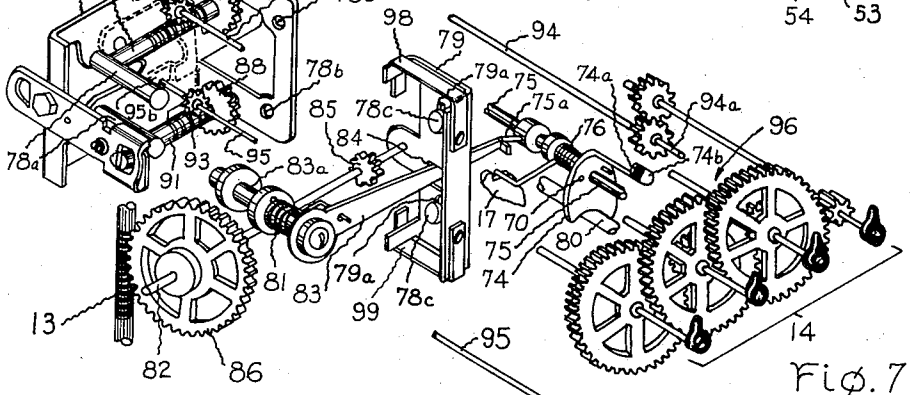


Fig. 7

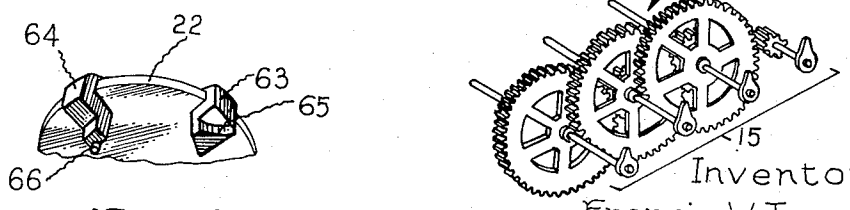


Fig. 6

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United States Patent Office 2,830,269 Patented Apr. 8, 1958

2,830,269

ELECTRIC METERING AND CONTROL DEVICE

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Application March 17, 1954, Serial No. 416,806

5 Claims. (Cl. 324—116)

This invention relates generally to combination electric metering and control devices and in particular to improvements in a combination watthour meter and time control switch.

As the use of domestic electric hot water heaters increases within any selected area serviced by a power company, it is many times found desirable to establish some form of so-called "off-peak control," and in one form thereof an important component of such control is the combination watthour meter and time switch of the type wherein a double register is provided to indicate on separate sets of dials the power consumed in the metered circuit during "off-peak control" periods and all other periods. One form of such combination device is shown in U. S. Patent No. 2,285,882, issued June 9, 1942, to H. H. Anderson et al., and it is seen that such devices normally embody some form of mechanism for shifting from one set of dials to the other, such shifting usually occurring concurrently with a switching action.

It is one of the objects of this invention to facilitate and simplify the aforesaid shifting action.

It is another object of the invention to provide a more compact, dependable, and simplified combination watthour meter and time control switch, one that is easier to maintain and service, and one that permits ready part replacement as required.

Briefly, the invention contemplates the rearrangement and reduction of parts whereby the energy stored in the control switch members is utilized to shift the meter driving element from one set of dials to the other while at the same time providing all necessary contact forces. Thus, with switch members in the form of flexible blades, the need for auxiliary levers and springs is eliminated, which of course materially simplifies the structure required.

Other objects and advantages will be apparent upon reference of the detailed description set forth below, particularly when taken in conjunction with the drawings annexed hereto, in which:

Figure 1 is a perspective view of the improved watthour meter and time control switch with a portion of the glass cover removed;

Figure 2 is a fragmentary perspective view of the switch shown in Figure 1, together with a portion of the shifting mechanism;

Figure 3 is a fragmentary perspective view of the switch latching mechanism, the parts being shown in their position corresponding to closure of the switch contacts;

Figure 4 is a fragmentary perspective view of the parts shown in Figure 3, the parts being shown in their position at the moment when the switch contacts just open;

Figure 5 is a fragmentary perspective view of the parts shown in Figure 3, the parts being shown in their position at the moment just prior to closure of the switch contacts;

Figure 6 is a fragmentary perspective view of the time dial, showing the "on" and "off" cam parts attached thereto; and

Figure 7 is a exploded, partly schematic, perspective view of the meter drive mechanism, the two sets of registering dials, and part of the shifting mechanism.

Referring first to Figure 1, there is shown a perspective view of a watthour meter and time switch suitably mounted on a molded plastic base member 8 and enclosed by a suitable glass cover 9, a portion only of which is shown. The wattmeter section includes a main type 11, which may be rigidly affixed to the base member 8 by rivets or the like, and an induction disc 12, suitably journalled for rotation in the frame and rotating in response to the flow of electric energy in the external electric circuit to which the meter is connected for measuring and controlling purposes.

The frame 11 is substantially identical to that shown in U. S. Patent No. 2,658,805, issued November 10, 1953, to L. I. Mendelsohn, and has a flat bottom section and has its sides extending upwardly and inwardly to form the somewhat circular top section. The wattmeter current and voltage windings and associated magnetic structure are carried by the frame 11 between the back surface of the frame and the base 8. The frame is slotted to receive the disc 12 and the journalling arrangements for the disc shaft are carried on the front side of the frame at the top and bottom thereof.

A detailed description of the wattmeter mechanism, including the frame 11 and disc 12, is not necessary for an understanding of the subject invention and an extended description of this portion of the combination device will be omitted for the sake of clarity, such details being known and understood by those skilled in the art. Suffice to say that the meter illustrated is designated commercially by applicant's assignees as the type I–50 single-phase watthour meter and in addition to the showing in Patent 2,658,805, may include some or all of the features shown in the following United States patents: Patent No. 2,272,748, issued February 10, 1942, to Kinnard; Patent No. 2,311,382, issued February 16, 1943, to Hansen, Jr.; Patent No. 2,316,368, issued April 13, 1943, to Trekell; Patent No. 2,595,244, issued May 6, 1952, to Goss et al.; and Patent No. 2,668,275, issued February 2, 1954, to Goss et al.

Part of the shaft on which the disc 12 is mounted may be threaded to form a worm 13 (shown in Figure 7) and by providing a suitable gear train, including a transfer mechanism, the worm can be caused to selectively drive either of the pair of registration mechanisms 14—15 mounted on the supports 16, 17, the supports in turn being rigidly affixed to frame 11 by screws or the like. Each mechanism includes a set of dials and cooperating pointers so that the power consumed in the metered circuit will be registered thereby.

Located in front of the main frame 11 and underneath the disc 12 is the time switch assembly, which includes an L-shaped support bracket 18, which is conveniently affixed to the meter frame 11 by means of a plurality of screws 19 or the like. Carried by the upright section 20 of support bracket 18 is a clock mechanism 21 and a clock-driven wheel 22; and mounted on the underside of bracket 18 is a terminal board 23. The wheel 22 is mounted for rotation on a shaft journalled between the upright section 20 and the auxiliary support plate 24, the plate being rigidly affixed to bracket 18 by means of a plurality of screws 25 and spaced therefrom by suitable spacer members 26. Between the plate 24 and the upright section 20 of bracket 18 there is also journalled for rotation a suitable gear reduction mechanism by which the clock 21 may be coupled to the shaft on which the wheel

22 is mounted. In this manner the wheel 22 can be driven continuously through a complete twenty-four hour cycle.

The clock mechanism and associated gear train form no part of the subject invention, and further description thereof has been omitted for the sake of clarity as such arrangements are quite conventional and known and understood by those skilled in the art. Suffice to say that the clock wheel 22 is driven by the clock and may have arranged around its periphery a plurality or switch actuating members, the exact configuration and purpose thereof being set forth in greater detail hereinafter. It is to be noted, however, that the clock mechanism and associated parts are sufficiently compact to lie substantially wholly beneath the disc 12.

The switch mechanism is best shown in Figures 2, 3, 4, and 5, and it will be seen upon referring to these figures that the switch mechanism comprises a set of contacts 27, 28 carried respectively by a pair of spring members in the form of upper and lower flexible blades 29, 31 having their fixed ends rigidly attached to terminal board 23. The terminal board 23 may be a molded plastic insulating member, suitably ribbed and channeled, as shown, to facilitate mounting of the switch blades and to add strength and rigidity thereto. It is secured to the flat bottom section of frame 11.

The ends of blades 29, 31 may be affixed to the terminal board 23 by means of rivets or other suitable techniques known to those skilled in the art and such mounting means includes a pair of terminal posts 32, 33 respectively carried by and mounted on opposite sides of the terminal board 23 for connection of external leads to the switch. In the form illustrated the posts comprise identical cylindrical members having a transverse aperture 34 in which the end of a lead may be inserted and held in place by a suitable set screw 35.

Mounted alongside of the contact carrying blades 29, 31 are the dummy blades 36, 37, which in turn have their fixed ends rigidly attached to the terminal board 23 by means of rivets or the like.

Overlying the upper surfaces of the outer extremities of the blades 29, 36 is an H-shaped insulating member 38 secured to the blades in any convenient form such as by rivets or the like, thereby providing therewith a substantially unitary structure consisting of the two spring members and the insulating member. The opposite edges of the H-member 38 are provided with identical reinforcing protective channel members 39 secured to the insulating member in any convenient manner such as by crimping or the like. The outer extremities of the member 38 are bridged by the metallic plate 41 conveniently attached to the member 38 by rivets or the like and having its outer extremity turned down over the outer edges of member 38 in the form of a lip 42. The lip 42 has a vertical projection 43 which serves as an index for the clock wheel 22, mounted for rotation in proximity thereto. The inner portion of the plate 41 overlies interconnecting portion of the H-member 38 and has a substantially wedge-shaped projection 44 extending rearwardly for cooperation with a latch member, such arrangement to be described in greater detail hereinafter.

Carried by the lower blade 31 is an insulating member 45 suitably affixed thereto by means of rivets or the like and having a configuration substantially the same as that portion of H-shaped member 38 lying immediately above it. Its outer edge is also reinforced and protected by a metallic channel member 46 suitably affixed thereto as by crimping or the like. The lower dummy blade 37 has no member mounted thereon corresponding to the member 45 but has its outer extremity offset at 47 and ribbed at 48 as shown to give rigidity thereto and also to cooperate with blades 29, 31 in providing the necessary shifting and switching action.

Supported by the members 38, 45, and 37 is an abutment member 49 having the inclined cam surface 51, the pair of identical upper shoulders 52, and the pair of identical lower shoulders 53. The abutment and the supporting parts can move with respect to one another, but in any position the upper shoulders always overlie portions of the H-shaped members 38 and the lower shoulders always overlie portions of the insulating member 46 and the elongated ribbed section of dummy blade 37. The abutment member 49 is confined between the interconnecting section of the H-shaped member 38 and a down-turned portion 54 of the plate 41.

Referring now to Figure 3, it is seen that support plate 24 has a downwardly projecting portion 55 which provides a support for a latch 56 pivoted thereto at 57. It is to be noted that the aperture 58 in the latch is elongated so that the latch can have a limited transverse motion with respect to its pivot 57. The latch 56 has the latching projection 59 and the inturned ear 61. In addition, the upper portion of the latch 56 is apertured as shown for receiving one end of a hairpin spring 62, the other end of which passes through an aperture in the H-shaped member 38 and is properly bent with respect thereto and thus is adequately supported thereby. The arrangement of the parts is such that the spring biases the latch downwardly and at the same time pulls it in a clockwise direction about its pivot.

Now referring to Figure 6, there is shown a portion of the clock-driven wheel 22 with the "on" tripper 63 and the "off" tripper 64, as seen from the inner side of the wheel, that is, the side opposite the clock face. The "on" tripper has an inclined cam surface 65 arranged to cooperate with the inclined cam surface 51 of the abutment member 49. The "off" tripper has the projecting pin 66 arranged to cooperate with the inturned ear 61 of the latch 56.

All of the blade members are biased upwardly so that any downward motion of the outer extremities thereof will store energy therein. Since the abutment member 49 has its upper and lower shoulders at all times overlying the blade members, the biasing action of these members will force the abutment member upwardly, when not restained by latch 56, until the upper surfaces of shoulders 52 rest against the identical stops 67 projecting outwardly from the support plate 24.

Now referring to Figures 1, 2, and 7, there is shown a shifting lever 68 having one of its extremities confined between the under side of the ear 61 and the end portion of the spring 62 extending through the aperture in the latch member 56. A shaft 69 is suitably journalled between the auxiliary plate 24 and a second auxiliary plate 71, which is rigidly attached to the first auxiliary plate by means of suitable screws and spacer members. The lever 68 is affixed to the shaft 69 so that limited pivotal action of the lever is provided. A stop 72 limits motion of the lever 68 in a counterclockwise direction.

Affixed to the outer end of lever 68 there is one end of a rigid wire member 73 extending upwardly and connected to a bell crank 74 by having its other end in the form of a hook extending through aperture 70 in the bifurcated portion of the crank. The bell crank 74 is attached to the shaft 75 which in turn is mounted for rotation between the supports 16, 17. The bifurcated portion straddles one of the spacer members 39 separating the supports 16, 17 and thereby limits rotation of the bell crank in both directions.

A coil spring 76 surrounds shaft 75 and has one end affixed to crank 74 and the other end confined within a slot in member 17 whereby it biases the shaft 75 in a clockwise direction. In this position the other end of the bell crank 74 has a black target area 74a cooperating with the aperture 77 to indicate that the upper register 14 is connected to the meter-driving element. The dial pointers of the upper register may be painted black to correspond to the black target showing through the aperture 77.

In the other extreme position of the bell crank 74 a

red area 74*b* next to the aforesaid black area is in registry with the aperture 77 to indicate that the lower register mechanism 15 is connected to the meter-driving element. The pointers of the lower register mechanism may be painted red to correspond to the red area on the bell crank 74.

The shaft 75 has its inner end journalled in plate 16 and its other end extends through the plate 17 and is supported by a U-shaped bracket 78 which lies behind the support plate 17 and is affixed thereto and spaced therefrom by suitable screws and spacer members, two of which are shown as the members 78*a*.

As shown in Figure 7, there is a cradle 79 slidably mounted with respect to bracket 78 and biased upwardly with respect thereto by means of the spring 81. The bracket 78 has a pair of apertures 78*b* in which are staked a pair of pins 78*c*, the pins extending through elongated cradle slots 79*a* to thereby support the cradle and allow same to have limited sliding motion.

The cradle 79 carries one end of a shaft 82 journalled for rotation therein, the other end of shaft 82 being journalled for rotation in a portion of bracket 78. The latter journalling arrangement permits limited pivotal motion of shaft 82 in response to vertical motion of the cradle 79.

The biasing action of spring 81 is transmitted to the cradle 79 by means of a crank 83 suitably mounted for rotation on the stud 83*a* affixed to bracket 78. Crank 83 has its outer end confined within the window 84 provided in the cradle 79 and extends therethrough to cooperate with the crank 75*a* affixed to shaft 75 whereby the cradle 79 is moved downwardly upon counterclockwise motion of shaft 75.

The shaft 82 has affixed thereto the pinion 85 and gear 86, the latter cooperating with and being driven by the worm 13 and the former selectively engaging either the upper pinion 87 or the lower pinion 88 to selectively drive either the upper or lower worm shafts 89, 91 affixed, respectively, to pinions 87, 88 and journalled between a leg of bracket 78 and the spacers 78*a*.

Selectively driven by the worm shafts 89, 91 are the upper and lower pinions 92, 93, each of which are coupled via the shaft 94, 95 to the upper and lower gear trains 96, 97 comprising the driving elements of the upper and lower registration mechanisms 14, 15 respectively.

The shafts 94, 95 are journalled for rotation between the support 16 and the bracket 78, passing through suitable apertures provided in support 17 and having their front ends 94*a*, 95*a* and back ends 94*b*, 95*b* extending through the plate 16 and bracket 78, respectively, so that the shafts may be arranged for limited axial motion against the biasing action of a spring member 90 at their back ends, to permit disengagement of the gear train and convenient re-setting of the pointers.

Affixed to the upper and lower parts of cradle 79 are the substantially L-shaped brake members 98, 99 for selectively engaging the pinions 87, 88. The parts are so arranged that when one pinion is engaged by driving pinion 85, the other is engaged by its juxtaposed brake. Thus, as shown in Figure 7, the cradle 79 is in its upper position by reason of the force provided by the biasing action of spring 81. In this position, upper pinion 87 is engaged by driving pinion 85, and lower pinion 88 is engaged by lower brake 99. The upper registration mechanism 14 is being driven by the wattmeter mechanism, and the black target area in bell crank 74 is in registry with aperture 77 to show this driving connection. Such position of the parts corresponds to the position of the contacts 28, 29 when they are open.

With the above arrangement of the parts in mind, the operation of the combination device will now be apparent.

Referring to Figure 3, the latch 56 is shown with its latching projection 59 overlying the part 44 extending out from the interconnecting portion of H-member 38. In this position, the H-member is restrained against moving to its position wherein it drives the abutment shoulders 52 against the stops 67. However, there is nothing restraining the lower blade members and the contact carrying blade 31 moves up and positively drives the contact 28 against the contact 27, thereby giving an effective switch closure.

In this condition of the parts, the shifting lever 68 has been moved away from the stop 72 whereby the wire 73 has caused the shaft 75 to rotate in a counterclockwise direction against the biasing force provided by spring 76 until the left prong of the bifurcated portion of crank 74 has come to rest against its cooperating spacer member.

During counterclockwise motion of shaft 75 the cradle 79 has been moved downwardly until the pinion 85 engages pinion 88 and the brake 98 engages pinion 87. In this position of the cradle the lower registration mechanism will be connected to the wattmeter mechanism and permit the dials to register the load during this period. At the same time, the end of the bell crank 74 having the black and red target areas thereon will have been moved in a counterclockwise direction to permit its red target areas 74*b* to register with the aperture 77 and thus indicate that the lower set of dials is registering the load of the circuit connected to the meter. This period of operation is referred to as the "Off peak" period.

Now assume that the dial wheel 22 has been driven by the clock 21 until its "off" tripper 64 is moving by the latch 56. The pin 66 will contact ear 61 and move the latch in a counterclockwise direction about its pivot 57 until the latching projection 59 clears the extension 44 of H-member 38. At this moment, as shown in Figure 4, the restraint on upward motion of H-member 38 is removed, thereby permitting this member to move upwardly against the underside of abutment shoulder 52 and thereby drive the abutment against the stops 67. At the same time the lower blades will move upwardly and will come to rest against the abutment shoulder 53. However, during the motion of the upper and lower spring blades the upper blade 29 will move away from its lower blade quite rapidly so that the contacts are separated with a substantially snap action.

With the driving force removed from the latch 56, the hairpin spring 62 will pull the latch downwardly and in a clockwise direction, thereby permitting the shifting lever 68 to move against its stop 72, thereby permitting the cradle 79 to return to its upper position in which the upper registration mechanism is connected to the wattmeter mechanism and the black target area on the bell crank 74 is in registry with the aperture 77. This condition of the meter is the "On peak" condition, and the upper registration mechanism 14 will totalize all energy consumed in the metered circuits.

As the dial wheel 22 continues to move under the influence of clock motor 21, the "on" tripper 63 will be brought into contact with the abutment 52. The co-action of the inclined cam surfaces 65 and 51 will drive the abutment downwardly, carrying with it all of the spring blade members. As the spring members move downwardly, considerable energy will be stored therein, and this energy will be released upon separation of the aforesaid cam surfaces 65 and 51.

As seen in Figure 5, the latching section 59 of the latch 56 has moved over the projecting part 44, and when the cam surfaces separate, the spring blades will rapidly move upwardly until the H-member 38 is stopped by the latch 56. However, the latch will move slightly by virtue of the elongated aperture 58 and as it moves it will carry with it the end of the spring 62 extending therethrough. Since this end of spring 62 co-acts with the shifting lever 68 the forces developed during this motion of the latch 56 will cause the shifting lever 68 to be rotated away from the stop 72 so that the cradle 79 is pulled downwardly to connect the lower registry mechanism with the driving element of the wattmeter mechanism.

Since the H-member 38 is stopped by the latch 56, the

lower spring members will continue coming upward until the contacts **28, 29** come together to establish the external electrical circuit through the water heater. We have now again reached the off-peak period of meter operation and the sequence will repeat itself as set forth above.

It is to be noted in Figure 1 that the clock-driven wheel **22** has an outwardly extending shaft to which is affixed a setting knob **101**. This knob is intended to cooperate with a manual setting arrangement of the type shown in the U. S. Patent No. 2,602,349, issued July 8, 1952, to G. B. Manning, whereby the setting can be done without removal of the watthour meter cover.

It is seen that the transfer mechanism for selectively connecting either of the registration mechanisms to the driving element of the wattmeter mechanism is biased for connection of the upper registration mechanism. This biasing is overcome by the action of lever **68**, and the forces for moving lever **68** to overcome the bias are furnished by the energy stored in the spring blade members during the interaction of cam surfaces **51** and **65**. In addition to furnishing the forces for shifting the transfer mechanism, the arrangement of the parts is such that the energy stored in the spring blades provides excellent contact force during closure of the switch contacts.

Moreover, the arrrangement and design of the switch permits a compact assembly with the watthour meter and produces a very dependable and rugged unit. Many of the parts are easily accessible for necessary service or adjustment and the design is such that the complete switch mechanism together with its associated clock can be removed from the watthour meter simply by disconnecting wire **73** from lever **68** and removing the screws holding the L-shaped bracket **18** in place.

In connection with the compactness achieved by the present arrangement, it is to be noted that the use of the L-shaped bracket **18** adds materially to this feature. Thus, the clock mechanism, clock wheel, and associated parts are mounted on the upright section **20** and lie beneath the disc **12**. The terminal board **23** is mounted on the underside of the other leg of bracket **18** and projects back underneath the flat section bottom of meter frame **11** and with the spring blades mounted thereon, substantially fills the otherwise unoccupied space in this portion of the meter.

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

1. An electric metering and control device comprising, in combination, a pair of registration mechanisms, a watthour meter disposed to be responsive to the flow of electric power in a circuit and to selectively operate said registration mechanisms to indicate the energy consumed in said circuits, circuit control means including clock-driven means and switching means actuated by said clock-driven means, said switching means including a pair of cooperating spring blade members and a pair of electric contacts actuated thereby, an abutment member carried by said spring members, said abutment member having cooperating shoulder portions normally overlying both of said spring members whereby the latter are normally spaced apart, said abutment member being normally urged against a fixed support by said spring members, means actuated by said clock-driven means to urge said abutment member away from said fixed support to store energy in said spring members, a rotatable and slidable latch member, means to position said latch member during energy buildup in said spring members, said means moving said abutment member suddenly clearing same to permit the energy stored in said spring members to tend to drive all displaced parts to their normal position, one of said spring members first causing said latch member to slide and then being stopped by said latch member to vary the spacing between said spring members and thereby permit closure of said contacts, said spring members furnishing the necessary force to hold said contacts together, and means for selectively transferring the driving connection of said watthour meter from one of said registration mechanisms to the other, said last-named means including an actuator moving in response to sliding motion of said latch member.

2. An electric metering and control device including a watthour meter disposed to be responsive to the flow of electric energy in an electrical circuit, said meter including a first and a second registration mechanism and rotatably mounted driving means adapted to rotate in response to said flow of energy, means including biasing means for selectively coupling said driving means to said registration mechanisms to thereby indicate the electrical energy consumed in said circuit, clock-driven means, circuit control means including a pair of electrical contacts, at least one of said contacts being mounted on a deflectable spring member having a first position, a pivotally mounted actuator connected to said coupling means, a rotatable and radially slidable latch member, means for positioning said latch member at a first radial position corresponding to the first position of said spring member, said actuator having a portion which cooperates with said latch member to effect changes in coupling between said driving means and said registration mechanism, said biasing means moving said actuator to a first position corresponding to coupling of said first registration mechanism with said driving means when said latch member is in said first radial position, an abutment member, first means actuated by said clock-driven means to drive said abutment member against said spring member whereby said spring member is deflected to store energy therein, said first means releasing said abutment member whereby said spring member moves in a return direction to drive said latch member to a second radial position, said latch member when moving to said second radial position driving said actuator to change the coupling of said meter driving means from said first registration mechanism to said second registration mechanism, said latch member when it reaches said second radial position functioning to stop said spring member in its return motion and hold it in a second position whereby said contacts are closed, and second means actuated by said clock-driven means to rotate and thus release said latch member to thereby permit said spring member to return to its first position whereby said contacts are opened, said means for positioning said latch member functioning when said latch member is released to return said latch member to said first radial position.

3. An electric metering and control device including a watthour meter disposed to be responsive to the flow of electric energy in an electrical circuit, said meter including a first and a second registration mechanism and rotatably mounted driving means adapted to rotate in response to said flow of energy, means including biasing means for selectively coupling said driving means to said registration mechanisms to thereby indicate the electrical energy consumed in said circuit, clock-driven means, circuit control means including a pair of electrical contacts, said contacts being mounted on first and second spaced deflectable spring members having a first position, a pivotally mounted actuator connected to said coupling means, a rotatable and radially slidable latch member, means for positioning said latch member at a first radial position corresponding to the first position of said spring members, said actuator having a portion which cooperates with said latch member to effect changes in coupling between said driving means and said registration mechanism said biasing means moving said actuator to a first position corresponding to coupling of said first registration mechanism with said driving means when said latch member is in said first radial position, an abutment member, first means actuated by said clock-driven means to drive said abutment member against said spring members whereby said spring members are deflected to store energy therein, said first means releasing said abutment member whereby said spring

members move in a return direction, said first spring member driving said latch member to a second radial position, said latch member when moving to said second radial position driving said actuator to change the coupling of said meter driving means from said first registration mechanism to said second registration mechanism, said latch member when it reaches said second radial position functioning to stop said first spring member in its return motion and hold it in a second position whereby said contacts are closed, and second means actuated by said clock-driven means to rotate and thus release said latch member to thereby permit said first spring member to return to its first position whereby said contacts are opened, said means for positioning said latch member functioning when said latch member is released to return said latch member to said first radial position.

4. An electric metering and control device including a watthour meter disposed to be responsive to the flow of electric energy in an electrical circuit, said meter including a first and a second registration mechanism and rotatably mounted driving means adapted to rotate in response to said flow of energy, means including a biasing means for selectively coupling said driving means to said registration mechanisms to thereby indicate the electrical energy consumed in said circuit, clock-driven means, circuit control means including a pair of electrical contacts, said contacts being mounted on first and second spaced deflectable spring members having a first position, a pivotally mounted actuator connected to said coupling means, a rotatable and radially slidable latch member, means for positioning said latch member at a first radial position corresponding to the first position of said spring members, said actuator having a portion which cooperates with said latch member to effect changes in coupling between said driving means and said registration mechanism, said biasing means moving said actuator to a first position corresponding to coupling of said first registration mechanism with said driving means when said latch member is in said first radial position, an abutment member, first means actuated by said clock-driven means to drive said abut-

ment member against said spring members whereby said spring members are uniformly deflected to store energy therein, said first means releasing said abutment member whereby said spring members move in a return direction, said first spring member driving said latch member to a second radial position, said latch member when moving to said second radial position driving said actuator to change the coupling of said meter driving means from said first registration mechanism to said second registration mechanism, said latch member when it reaches said second radial position functioning to stop said first spring member in its return motion and hold it in a second position, said second spring member being stopped by said first spring member whereby said contacts are closed with a snap action, and second means actuated by said clock-driven means to rotate and thus release said latch member to thereby permit said first spring member to return to its first position whereby said contacts are opened with a snap action, said means for positioning said latch member functioning when said latch member is released to return said latch member to said first radial position.

5. The combination defined by claim 4 wherein said watthour meter is mounted on a main frame and said rotatably mounted driving means includes an induction disc journalled for rotation in said main frame, said disc extending outwardly at right angles to said main frame, a substantially L-shaped auxiliary frame, all of said clock-driven mechanisms, said contact-carrying spring members, said abutment member said latch member and said pivotally mounted actuator being mounted on said auxiliary frame, said auxiliary frame assembly being mounted on said main frame underneath said induction disc and in complementary relationship therewith.

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