

(No Model.)

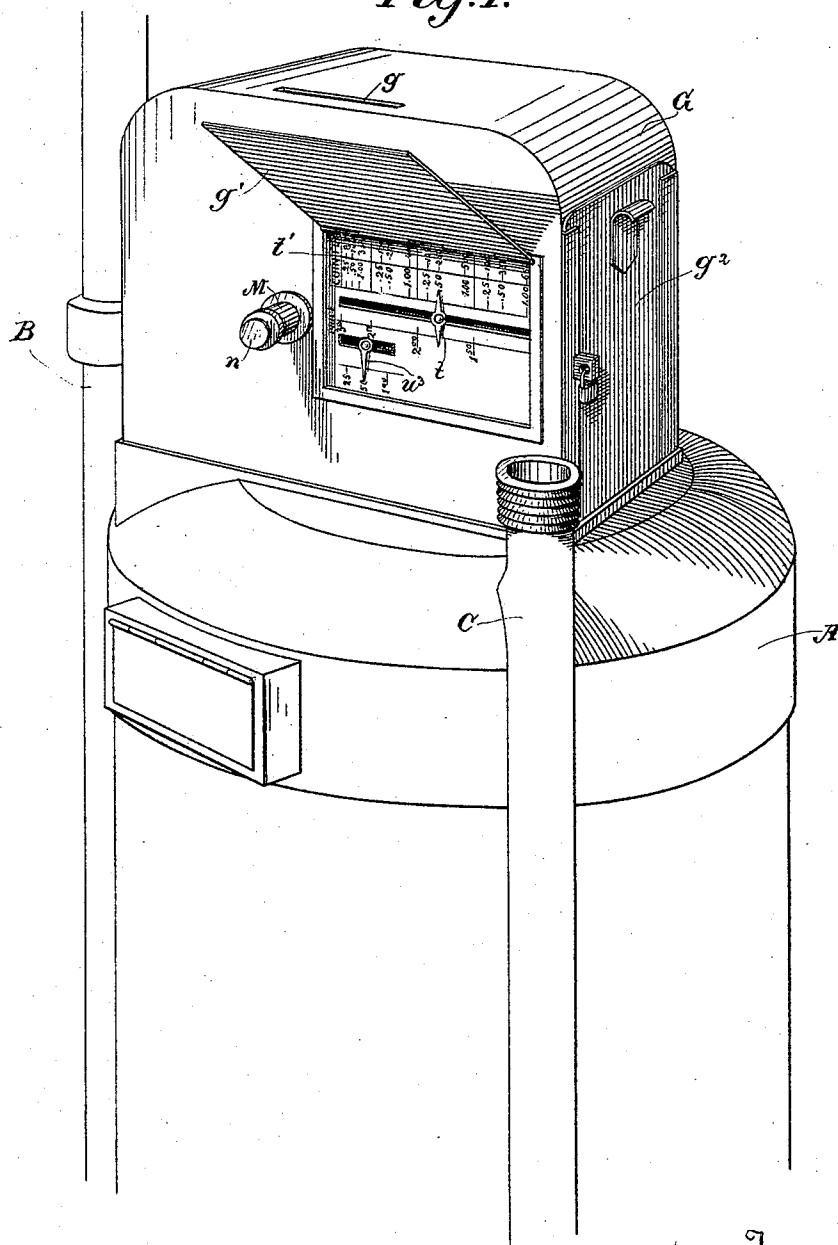
2 Sheets—Sheet 1.

H. W. WILLIAMS.
PREPAYMENT ATTACHMENT FOR METERS.

No. 575,672.

Patented Jan. 19, 1897.

Fig. 1.



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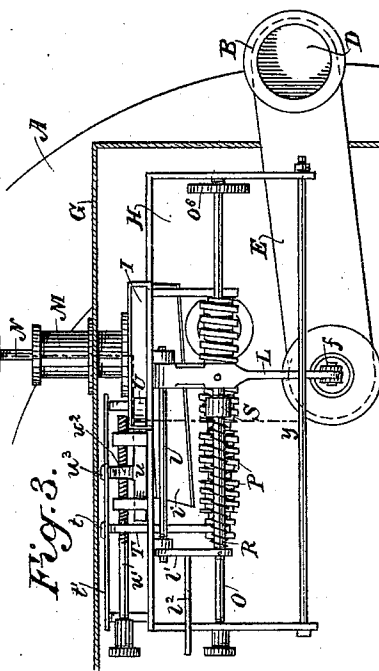
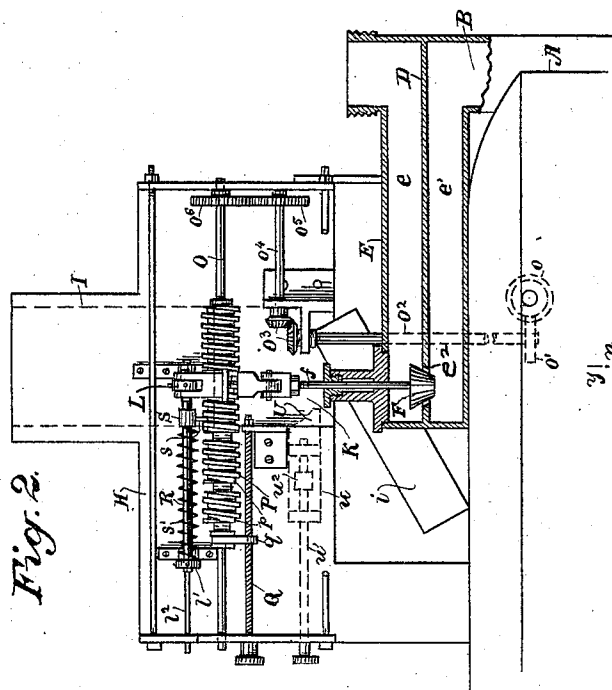
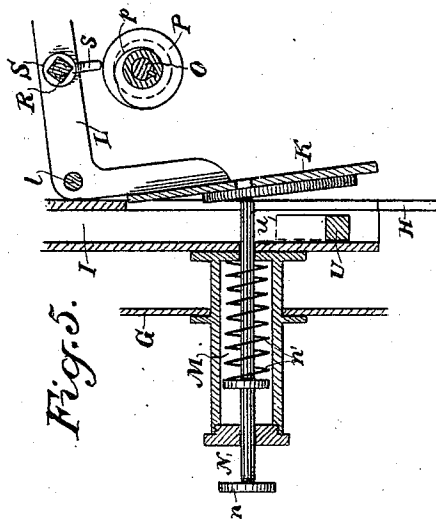
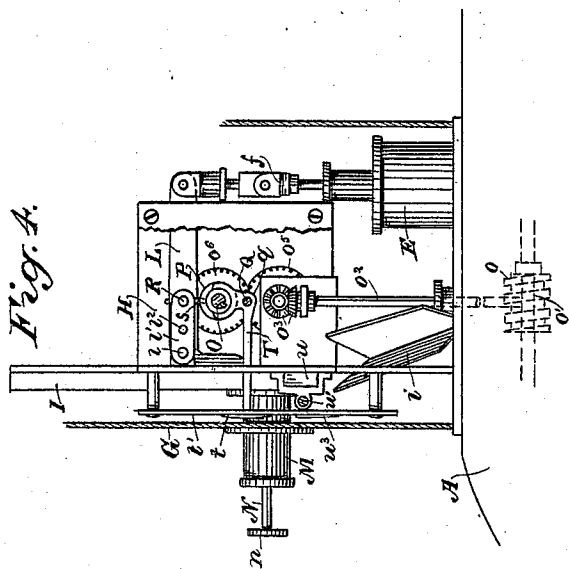
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2 Sheets—Sheet 2.

H. W. WILLIAMS.
PREPAYMENT ATTACHMENT FOR METERS.

No. 575,672.

Patented Jan. 19, 1897.



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UNITED STATES PATENT OFFICE.

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PREPAYMENT ATTACHMENT FOR METERS.

SPECIFICATION forming part of Letters Patent No. 575,672, dated January 19, 1897.

Application filed April 17, 1896. Serial No. 587,907. (No model.)

To all whom it may concern:

Be it known that I, HUGH WEBSTER WILLIAMS, a citizen of England, residing at San Leandro, county of Alameda, State of California, have invented an Improvement in Prepayment Attachments for Meters; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in the mechanism and construction of attachments for meters whereby such mechanism is operated and regulated by the insertion of a coin into a slot or chute; and the objects are, first, to produce a comparatively simple and efficient mechanism which upon the insertion of a certain coin will open the controlling-valve of gas and water meters and make the circuit-current of an electric meter and permit the commodity to flow through the meter corresponding in value to the value of the coin inserted, and on the expiration of that quantity to then automatically cut off the supply and consequently stop the meter; secondly, to construct the mechanism in such a way that it may be easily changed without removing the parts of the machine, so as to adapt the mechanism to different coins and permit a quantity of the commodity to be sold corresponding in value to the coin which the machine is prepared to receive and which is inserted in the slot or chute before the said commodity can be delivered; thirdly, to construct the mechanism so as to give reasonable warning to the customers when the quantity of commodity corresponding in value to the coin last inserted is about to expire.

To these ends my invention consists in the construction, combination, and arrangement of parts which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings, Figure 1 is an exterior view showing my attachment applied to the meter. Fig. 2 is a rear elevation. Fig. 3 is a top view. Fig. 4 is an end view. Fig. 5 is a section on line *y y* of Fig. 3.

A represents a meter of any suitable character and for any purpose, either a gas, water, or electric meter. For the sake of illustration it may be a gas-meter, as its shape indicates.

B represents the inlet to the meter, and C

the outlet connection. In the inlet B before it reaches the meter is inserted a stop or barrier D, which extends outwardly and divides a short casing E into two passages *ee'*, the former of which communicates with the inlet above the barrier or stop and the latter communicates with the inlet below the barrier or stop, said passages communicating at their other ends through a port *e''*, which is controlled by a valve F. It will thus be seen that when the valve is raised the communication is open to the meter and when it is closed the communication is entirely shut off.

On top of the meter is a casing G, having a slot *g* in its top for the insertion of a coin, a door *g'* in its front for the inspection of the adjustment-indicators, and a slide or door *g''* in its end for the removal of the deposited coins. Within this casing is a frame H, which supports a coin-chute I, the upper end of which alines with the coin opening or slot *g* in the casing G. The lower end of this chute communicates with a directing-chute *i* to pass the coin on down into the bottom of the casing. In the inner side of the chute, at its lower end, is a swinging or movable plate K, which forms the inner lower wall of said chute, and said plate is secured to the short arm of an elbow-lever L, which is itself fixed at its angle to a pivotal shaft *l*, and said lever has its outer end connected with the stem *f* of the valve F. On the face of the chute is secured a sleeve or housing M, which extends outwardly through the casing G. Within this housing is fitted and adapted to slide a push-rod N, having a head *n* upon its outer end and controlled by a spring *n'*, whereby said rod is held projected outwardly. The inner end of this push-rod is adapted to traverse the lower end of the coin-chute and if no coin intervenes to pass through a hole in plate K, so that when the coin is absent, if the push-rod be forced in, it has no effect upon the swinging plate, as it passes freely into the hole in the plate; but by the interposition of a coin within the chute the push-rod will, by coming in contact with said coin, force the coin to swing the plate K, which movement of the plate will, through the elbow-lever L, cause the valve F to rise and so open the communicating port of the meter. When the push-rod is released, its spring will throw it

out again and the coin will drop down into the casing, while the swinging plate will return to its closed position under the weight of the parts and the valve F will automatically close and cut off the communication with the meter.

In the frame H is mounted a rotatable shaft O, upon which is fitted a screw P, so arranged upon the shaft that it will rotate with said shaft and may also have an independent sliding movement lengthwise upon the shaft, which latter movement is effected by means of a feed-screw Q, engaging a nut *q*, which engages one end of the screw. The shaft O is driven by means of power-transmitting connections from the operating parts of the meter itself. These parts need not be herein shown, it being only necessary to indicate a worm *o*, which may be said to be driven by the meter, said worm engaging with a worm-pinion *o'* on a vertical shaft *o''*, extending upwardly through the meter-top into the casing G, and geared at *o'''* to a counter-shaft *o''''*, which has a pinion *o'''''* upon it, meshing with a pinion *o''''''* on the shaft O.

Secured upon one end of the pivotal shaft *l* is an outwardly-extending arm *l'*, between the extremity of which and the long arm of the elbow-lever L extends a guide rod or bar R, upon which is mounted and adapted to slide a sleeve S, which has a downwardly-extending finger *s*, adapted to play in the groove between the threads of the screw P below. The depth of this groove is such that when the finger *s* rests in it the lever L is held up and the valve F is kept open, but said groove at its extremity terminates in a depression deep enough that when the finger *s* emerges into it the lever L drops and the valve F closes. A spring *s'* tends to throw the sleeve S over against the long arm of the elbow-lever L.

Extending outwardly from the nut *q*, which engages with the feed-screw Q, is an arm T, guided in a slot in the front of the frame H and having on its outer end an indicator *t*, which plays over a dial *t'*, adapted to be seen through the door *g'* in the casing G. This dial has marked upon it a scale of figures indicating the value of the commodity to be dispensed and the number of feet at varying rates per thousand which can be had for a given sum. Now by operating the feed-screw Q so as to slide the screw P along the shaft O the indicator *t* will also move correspondingly to the figures representing the value of the coin for which the machine is to be adjusted, say for a twenty-five-cent piece. This movement of the screw will also, by the impingement of its end thread upon the finger *s* of the sliding sleeve S, bodily force said finger along the guide-rod R and thus compress the controlling-spring *s'*, and this movement of the finger will be equivalent in distance to the movement of the indicator on the dial.

The device is now ready for operation. Now a twenty-five-cent piece is dropped into

the chute I, and by means of the push-rod N the swinging plate or wall K is forced inwardly, through the intervention of the coin, and said plate will, as before described, lift the elbow-lever L and open the valve F. This rise of the elbow-lever L will cause the rise of the guide-rod R, which is secured to it, and the consequent lifting of the finger *s* from behind the end thread of the screw P, and as soon as the finger is free the spring *s'* will force the sliding sleeve S over to its limit against the elbow-lever L and thereby cause the finger *s* to move over and free of the top of the screw to a distance equal to that to which it had been forced sidewise, as the screw was moved along to its initial adjustment. Now as soon as the coin is dropped from the chute the plate K and the elbow-lever L return partially; but the screw-groove is not deep enough to allow the finger *s* to come far enough down to permit the valve F to close entirely, so that said valve is still open and remains so as long as the finger is in engagement between the threads of the screw. As the valve F is now open and the meter starts to operate the shaft O is revolved and with it the screw, which now begins to feed the finger *s* out again to its initial position. During this feed of the finger and the operation of the screw, and as long as the finger remains in engagement between the threads of the screw, the valve F is held open and the gas passes through the meter; but when the finger reaches the end of the thread-groove it drops out into the depression at the end, thereby allowing the valve to descend and cut off the connection, and at this time the value of the commodity equals the value of the coin. The finger is now in a pressed-over position, ready to return to its engagement with the screw, when upon the deposit of a coin the operation is repeated.

It will be readily understood that the speed of rotation of the screw, the pitch of its thread, and its sliding movement along its shaft are all properly initially determined and made to accord to the number of feet of gas, at a given price, which it is intended a given coin shall purchase. If it be desired to set the device for the sale of fifty cents' worth of the commodity, the screw is slid endwise until the indicator shows "50" on the dial-scale. This provides for a greater length of thread to engage with the finger and hold the valve open, and consequently more gas is supplied. The coin-chute will of course be adjusted to a fifty-cent coin.

Now in order that warning may be given a proper period previous to the expiration of the time of the commodity supply I provide that the extremity of the screw-thread groove shall gradually deepen on a descending inclined plane, as is shown at *p*, whereby as the finger *s* gets into this gradually-deepening portion of the groove the elbow-lever L will be permitted to move down gradually, and by making the valve F conical in shape,

as I have shown, it will gradually cut off the port until the finger gets entirely out of the groove, when the port will be fully cut off. This operation can be continued in time to such length as may be desired to give fair warning of the expiration of the supply. Now in order to adapt this attachment for adjustments both with relation to the different sizes of coins which may be deposited and with relation to the different prices per thousand at which the gas or other commodity may be supplied I have adopted the following constructions: Partially traversing the base of the chute I is a rest-bar U, which is formed with a slide-body u , adapted to be fed by means of a feed-screw u' , said body having extending outwardly from it an arm u^2 , carrying an indicator u^3 , playing over the dial, which has upon it scale-figures representing different sizes of coin. Now by turning the feed-screw u' so as to cause the slide-body to move inwardly until the indicating-finger reaches the figures 25, representing a twenty-five-cent coin, the rest-bar U will be thereby moved into the chute far enough to diminish the width of said chute to less than the diameter of a twenty-five-cent coin, so that said coin will be supported within the chute temporarily and until the push bar or rod can engage it and force it over against the swinging plate K, as heretofore described; and said plate, yielding inwardly, will afford enough room, when the push-rod is released, to permit the coin to drop down past the rest-bar into the directing-chute below. In like manner, by moving the feed-screw until the indicating-finger shall reach the numeral "50," representing a fifty-cent coin, the rest-bar will be withdrawn from the chute sufficiently to just support a fifty-cent piece, but it will leave the chute too wide to support a twenty-five-cent piece, so that any attempt to operate the device by the latter coin will result in failure, for the reason that said coin will merely drop through at once. Likewise the adjustment can be made to other sizes of coin, as, say, for example, a dollar-piece.

Now although a single long screw might be used to adjust the machine for different rates per thousand such an arrangement would have the disadvantage of confusing the dial, and to avoid this I have adopted the following construction: The dial, as will be seen, is marked with a plurality of scales of the same figures, indicating the values of coins, and these sets of scales represent, respectively, the different rates per thousand at which the gas is sold. For example, one set may represent a rate of one dollar and fifty cents per thousand, another two dollars, and other two dollars and fifty cents per thousand, and another three dollars, and the individual lines of these sets are arranged closer together or farther apart, according to the values they represent per thousand, so that the consequent movement of the screw will correspond and furnish a greater or less length of its

thread, as may be required. I divide the screw, in furtherance of this object, into a plurality of distinct sections, as shown, with intervening deep terminals. One of these sections, if brought by means of the feed-screw into operative relation with the sliding finger, will represent the furnishing of the commodity at one rate per thousand, and another at another rate, and so on, corresponding with the divisions on the dial. Thus if the gas be as cheap as one dollar and fifty cents per thousand the screw will be fed over until its end section is brought into operative relation with the sliding finger, and the indicator will likewise be brought over to that portion of the dial which represents that rate. Then, as the lines on this portion of the dial are far apart, it follows that in moving the indicator between these marks a corresponding length of thread on that section of the screw will be supplied to feed the sliding finger s , and so on throughout the several sections. This adjustment is of course made, in the first instance, according to the rate, and to facilitate the movement of the screw to this adjustment a short handle-bar l^2 may project from the arm l' , so that the operator can readily raise and hold the sliding finger s above the screw while he is adjusting it; also, the coin adjustment, by means of the sliding rest-bar, is regulated, in the first instance, according to the desires of the customer as to whether he wishes to make a practice of buying twenty-five cents' worth of the commodity, or fifty cents' worth, or what not. The casing G is locked down, so that no tampering can be had with the attachment after the adjustment is effected.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In prepayment attachments for meters, the combination, of a normally-closed valve for controlling the meter connection, a means, dependent upon the deposit of a coin, for opening said valve, and means for holding the valve open and permitting it to close at the expiration of a given time, comprising a rotatable screw, a lever connected with the valve and a spring-actuated slidable finger adapted to engage said screw and hold the lever to maintain the valve open during said engagement and to allow the valve to close when said engagement terminates by the rotation of the screw.

2. In prepayment attachments for meters, the combination of a normally-closed valve for controlling the meter connection and a means, dependent upon the deposit of a coin, for opening said valve, consisting of a coin-chute, having one of its walls composed of a movable plate, a push-rod for forcing the coin against said plate to move it, and a lever connected with the plate and with the valve, to open the latter upon the movement of the former.

3. In prepayment attachments for meters, the combination of a normally-closed valve

for controlling the meter connection, a means, dependent upon the deposit of a coin, for opening said valve, consisting of a coin-chute, having one of its walls composed of a movable plate, a push-rod for forcing the coin against said plate to move it, and a lever connected with the plate and with the valve, to open the latter upon the movement of the former, and a rotating screw and devices controlled thereby for holding said valve open and permitting it to close at the expiration of a given time.

4. In prepayment attachments for meters, the combination, of a normally-closed valve for controlling the meter connection, a means, dependent upon the deposit of a coin, for opening said valve, a rotatable screw and a spring-actuated slidable finger controlled thereby for holding said valve open and permitting it to close at the expiration of a given time, and power-transmitting connections from the operating parts of the meter, to rotate the screw.

5. In prepayment attachments for meters, the combination of a normally-closed valve for controlling the meter connection, a means dependent upon the deposit of a coin for opening said valve, comprising a coin-chute having a movable wall, and means for forcing the coin against said wall and for opening the valve upon the movement of said wall, a rotating screw, and a sliding finger in the valve-opening connections adapted to engage said screw and hold the said connections to keep the valve open during said engagement and to allow the valve to close when said engagement terminates by the rotation of the screw.

6. In prepayment attachments for meters, the combination of a normally-closed valve for controlling the meter connection, a means dependent upon the deposit of a coin for opening said valve, consisting of a coin-chute with its movable wall or plate and push-rod, and the lever of the plate connected with the valve, a rotating screw, and the spring-controlled sliding finger carried by connections from the lever, said finger being normally pressed back by the screw end, until lifted by the lever, and then engaging the screw-threads and holding the valve open during the continuance of said engagement.

7. In prepayment attachments for meters, the combination of a spring-controlled sliding finger adapted by its position to hold the controlling-valve of the meter connection open, and a rotating screw adapted to engage and to maintain the position of said finger and feed it to its disengagement to permit the valve to close.

8. In prepayment attachments for meters, the combination of a spring-controlled sliding finger adapted by its position to hold the controlling-valve of the meter connection open, and a screw and means for rotating it from the meter and adapted to engage and to maintain the position of said finger and to feed it to its disengagement to permit the valve to close.

9. In prepayment attachments for meters,

the combination, of a normally-closed valve for controlling the meter connection, a means, dependent upon the deposit of a coin, for opening said valve, a rotating screw and a spring-actuated slidable finger controlled thereby for holding said valve open and permitting it to close at the expiration of a given time, and means for varying the position of the screw relatively to the devices it controls, whereby the length of time the valve is kept open may be varied.

10. In prepayment attachments for meters, the combination, of a coin-chute having a swinging wall, a push-rod for forcing the coin against said wall to move it, a lever connected with the plate and a normally-closed valve connected with the lever and controlling the meter connection, means for holding the valve open and a movable rest-bar adapted to partially traverse the chute and by its movement to narrow or widen the same to receive and temporarily support different sizes of coins.

11. In prepayment attachments for meters, the combination of a spring-controlled sliding finger adapted by its position to hold the controlling-valve of the meter connection open, a rotary and slidable screw adapted to engage and maintain the position of said finger and to feed it to its disengagement to permit the valve to close, and means for sliding the screw, to vary the length of time of its engagement with said finger.

12. In prepayment attachments for meters, the combination of a spring-controlled sliding finger adapted by its position to hold the controlling-valve of the meter connection open, a rotary and slidable screw adapted to engage and maintain the position of said finger and to feed it to its disengagement to permit the valve to close, and means for sliding the screw, to vary the length of time of its engagement with said finger, and to visibly indicate its adjustment.

13. In prepayment attachments for meters, the combination of a normally-closed valve for controlling the meter connection, a means dependent upon the deposit of a coin for opening said valve, a rotating screw composed of a plurality of distinct sections, devices controlled by the screw and its rotation for holding said valve open and permitting it to close at the expiration of a given time, and means for varying the position of the screw relatively to the devices it controls, whereby any of its sections may be brought into operative relation with said devices.

14. In prepayment attachments for meters, the combination of a spring-controlled sliding finger, adapted by its position to hold the controlling-valve of the meter connection open, a rotary and slidable screw adapted to engage and maintain the position of said finger and to feed it to its disengagement, to permit the valve to close, said screw being composed of a plurality of distinct sections, and means for sliding the screw to bring any

of its sections into operative relation with said finger.

15. In prepayment attachments for meters, the combination of a spring-controlled sliding finger, adapted by its position to hold the controlling-valve of the meter connection open, a rotary and slidable screw adapted to engage and maintain the position of said finger and to feed it to its disengagement, to permit the valve to close, said screw being composed of a plurality of distinct sections, means for sliding the screw to bring any of its sections into operative relation with said finger, an indicator operated by the sliding of the screw and a plurality of distinct scales over which the indicator plays, whereby the sliding movement of the screw may be varied in accordance with the correspondence of its sections with said distinct scales.

16. In prepayment attachments for meters, the combination, of a normally-closed valve for controlling the meter connection and a means, dependent upon the deposit of a coin, for opening said valve, consisting of a coin-chute, having one of its walls composed of a movable plate, a push-rod for forcing the coin against said plate to move it, a lever connected with the plate and with the valve, to open the latter upon the movement of the former, and a movable rest-bar adapted to partially traverse said chute and by its movement to narrow or widen the chute to receive and temporarily support different sizes of coins.

17. In prepayment attachments for meters,

the combination of a normally-closed valve for controlling the meter connection, a coin-chute having a movable wall, a push-rod adapted to move said wall upon the interposition of a coin, a movable rest-bar partially traversing the coin-chute to provide by its adjustment for the temporary support of different sizes of coins, a lever connected with the movable wall and connected with the controlling-valve, a spring-controlled sliding finger carried by the lever and a rotating screw with which said finger engages to hold the lever and keep the valve open, said finger being fed by the screw to its disengagement to close the valve upon the expiration of a given time.

18. In prepayment attachments for meters, the combination of the spring-controlled sliding finger adapted by its position to hold the controlling-valve of the meter connection open, and the rotating screw between the threads of which the finger is fed to its disengagement to permit the valve to close, said screw having the extremity of its spiral groove formed with a descending inclined plane whereby the finger is gradually fed down the incline to cause a gradual closing of the controlling-valve.

In witness whereof I have hereunto set my hand.

HUGH WEBSTER WILLIAMS.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.