

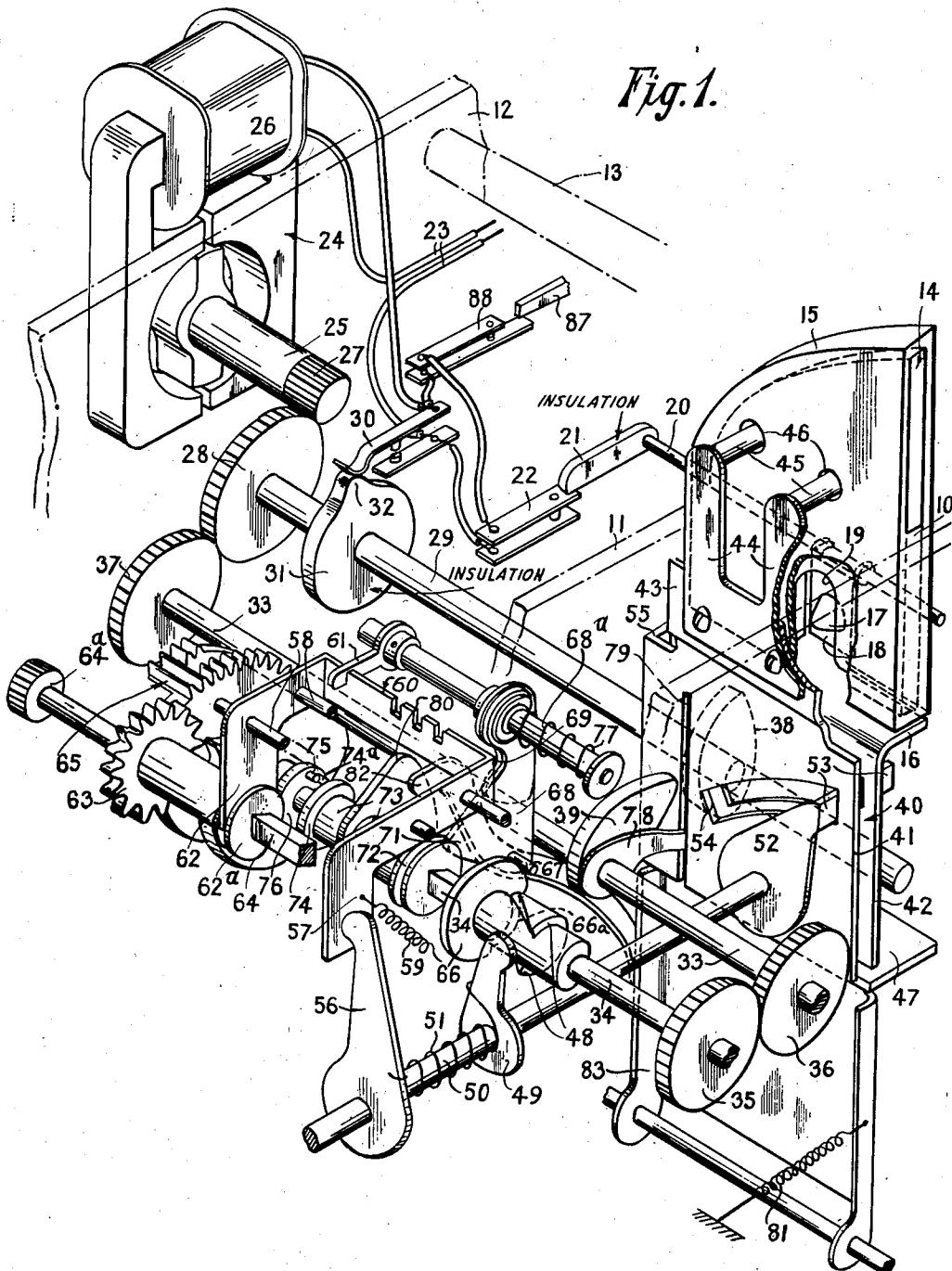
Dec. 9, 1941.

A. H. WICKHAM
PREPAYMENT MECHANISM

2,265,256

Filed May 19, 1938

2 Sheets-Sheet 1



Inventor
Alfred Henry Wickham
By Brown, Jackson, Butcher & Quinn Attys.

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PREPAYMENT MECHANISM

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2 Sheets-Sheet 2

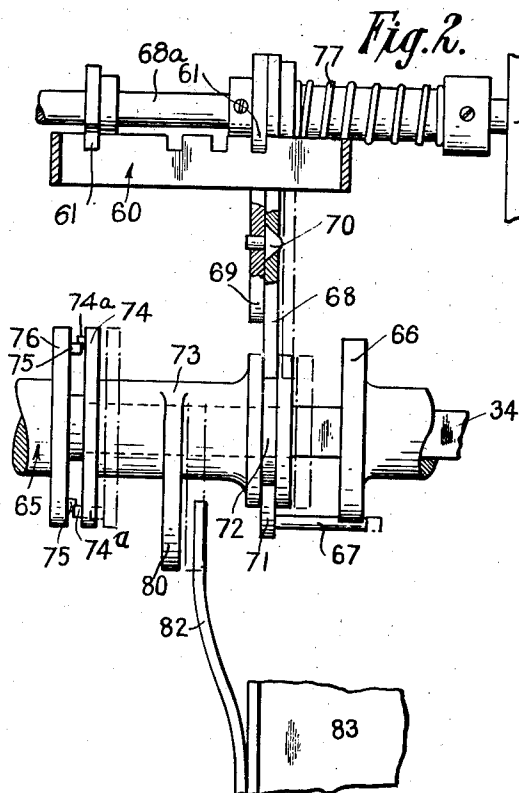
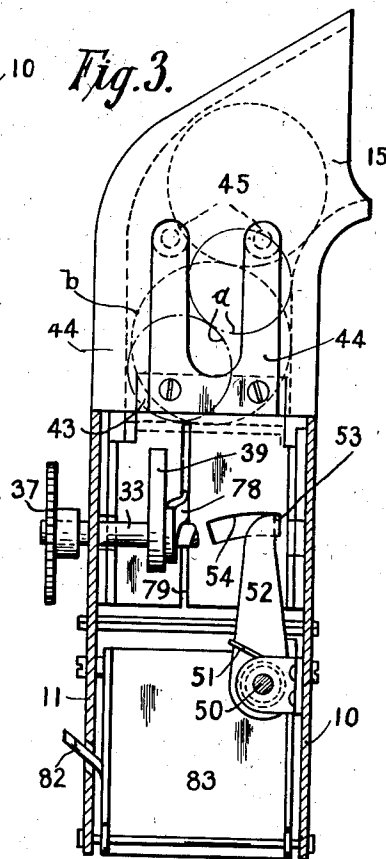
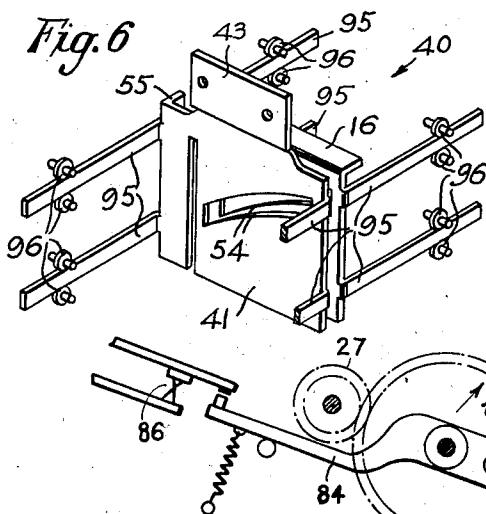
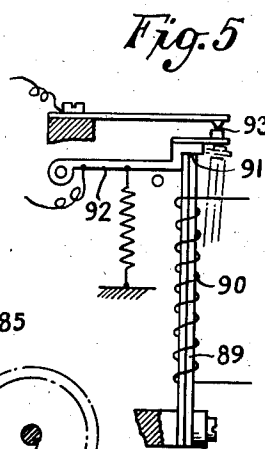


Fig. 4

Inventor
 Alfred Henry Wickham
 By Brown, Jackson, Butcher & Vienna
 Attys.

UNITED STATES PATENT OFFICE

2,265,256

PREPAYMENT MECHANISM

Alfred Henry Wickham, Enfield, England, assignor to Sangamo Electric Company, Springfield, Ill.

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In Great Britain May 24, 1937

5 Claims. (Cl. 194—3)

The present invention relates to prepayment mechanisms which, while particularly applicable to the controlling of electric supply meters, are also capable of application in a much wider sphere, as will readily be appreciated.

One object of the invention is to reduce the operation on the part of the user to a minimum so as to avoid as far as possible any trouble due to mistaken understanding of the instructions for the use of the mechanism.

Another object of the invention is to permit the insertion into the coin aperture or receiving chamber of the prepayment mechanism of a plurality of coins which may be for instance coins of a predetermined diameter or diameters to effect an operation and may also include coins of different diameters which will not effect an operation, thereby ensuring that all coins will be dealt with irrespective of whether or not they are suitable for the operation of the mechanism and so prevent any coin having an obstructive effect with consequent disablement of the mechanism.

According to one principal feature of the invention a prepayment mechanism is arranged to be operated wholly automatically by any coin or like object insertable through the coin insertion aperture. The particular operations effected by the prepayment mechanism during passage of a coin therethrough are governed by whether or not the inserted coin or other object passes one or more tests. These tests preferably include the measurement of the diameter of the coin.

According to a further feature of the invention the insertion of a plurality of coins substantially simultaneously, i. e. in immediate succession one after the other is followed by the holding of all but the first coin until such coin has been dealt with by the mechanism to a point ensuring its discharge therefrom. Upon such discharge taking place a further coin, if available, is automatically fed to the mechanism to effect a second operation thereof and so on.

In order that the above and other features of the invention may be more readily understood a constructional embodiment thereof will now be described by way of example with reference to the accompanying drawings, wherein:

Fig. 1 is a perspective view, semi-diagrammatic in form, illustrating the principal elements of the device;

Fig. 2 is an enlarged cross-sectional detail view of part of Fig. 1;

Fig. 3 is a detail view showing the coin chute

and the coin-handling chamber in side elevation together with the mechanism associated therewith;

Fig. 4 is a further detail view of an auxiliary device for use with the mechanism for automatically disconnecting an electric power supply used for operating the mechanism if the latter becomes jammed;

Fig. 5 is another detail view showing a modified arrangement for disconnecting the electric power supply in the event of faulty operation; and

Fig. 6 is a detail perspective view showing the mounting of the coin chamber.

The device shown comprises front, mid and rear main frame plates 10, 11 and 12 held together in suitable spaced relation by spacing rods 13. These members are shown in chain dotted lines only in Fig. 1 for the sake of clarity. A coin insertion aperture 14 leads to a coin chute 15 capable of holding a number of coins edge to edge in the manner more clearly illustrated in Fig. 3. The bottom of the coin chute is closed by a removable platform 16. A coin standing on this platform engages a nose 17 carried by a rocking lever 18 and projecting through an aperture 19 in one side wall of the coin chute. The rocking lever 18 is secured to a spindle 20 rotatably mounted in the frame plates 10 and 11 and provided with an arm 21 of insulating material which is adapted to operate a pair of electric contacts 22 in such a manner that the presence of a coin in the coin chute 15 opposite the nose 17 and resting upon the platform 16 causes closure of the contacts 22.

The contacts 22 form one path for the supply of electric current over leads 23 from a suitable power source, for instance, in the case of an electricity supply meter, from the supply mains, to an electric driving motor 24. This driving motor may be of any desired type but is preferably, if the supply source is A. C., of the ball clutch or ratchet operating type of impulse motor. Such a motor is illustrated in Fig. 1 and comprises a magnetized armature loosely mounted upon a motor shaft 25 and operating between the pole tips of a field structure energized by a suitable winding 26. The vibratory motion of the magnetized armature between the pole tips when the latter are energized by an alternating current supply, is converted into a unidirectional rotation of the shaft 25 by means of ratchet and pawl or ball clutch mechanism, not shown.

The motor shaft 25 is provided with a pinion

gear 27 at one end in driving connection either directly or through a suitable gear train with a spur wheel 28 secured to a drive shaft 29 rotatably mounted in the frame plates. The drive shaft 29 is arranged to make one complete revolution for each operative cycle of the mechanism and to ensure that the motor 24 is appropriately energized exactly to effect this complete revolution, a further set of electric contacts 30 are provided and wired in parallel with the contacts 22. The contacts 30 are controlled by a cam 31 of insulating material rigidly secured to the shaft 29 and provided with a projection 32 which operates to engage and normally open the electric contacts 30. The position shown in Fig. 1 is the position of rest of the device and the manner of operation upon insertion of a coin is that such insertion causes the closure of the contacts 22 by engagement of the coin with the nose 17. This circuit closure causes energization of the winding 26 and operation of the motor 24 whereby the motor shaft 25 and the drive shaft 29 are rotated. The first movement of the shaft 29 removes the projection 32 from engagement with the contacts 30 which are thus closed and form a second or shunt path for maintaining operation of the motor 24. During the subsequent cycle of operations the coin which causes closure of the contacts 22 is removed from the coin chute and these contacts thus allowed to open but the motor remains energized to complete the operative cycle by reason of the shunt contacts 30 which are only opened at the exact instant of completion of the cycle by the reengagement of the projection 32 therewith. If a further coin has not already passed into the coin chute 15 to reclose the contacts 22 the apparatus then comes to rest.

The operation of the motor causes the rotation of the drive shaft 29 and also the rotation of further shafts 33 and 34 parallel therewith, the latter shafts being geared to each other and to the drive shaft 29 by gear wheels 35, 36 and 37. Each of these further shafts also makes one complete revolution per operative cycle of the mechanism. The shafts 29 and 33 carry co-operating cams 38 and 39 respectively, which serve by their action one on either side of a coin chamber 40, to move the latter positively backwards and forwards in a direction normal to the plane of a coin situated therein.

Referring now particularly to Figure 6 of the drawings, the coin chamber 40 comprises two substantially parallel plates 41 and 42 located in spaced relation sufficient to permit the location therebetween of any coin insertable into the coin insertion aperture 14. The plate 42 is bent at right angles at its upper end in a direction away from the plate 41 to form the movable platform 16, while the other plate 41 is provided with an off-set upward extension 43 carrying a two-armed blade spring member 44 (Figure 1) each arm of which is provided with a laterally projecting pin 45. The pins 45 are arranged to project through apertures 46 in one wall of the coin chute 15 for a purpose hereinafter described. A pair of horizontal guide arms 95 project from each vertical edge of the plates 41 and 42. Each of the guide arms 95 runs through a set of support rollers 96 allowing the chamber to be shifted backwards and forwards by the cams 38 and 39.

In the operation of this portion of the mechanism the initial part of the movement of the shafts 29 and 33 upon energization of the motor 24 causes the sideways displacement of the coin

chamber 40 to the right (Fig. 1) so as to remove the platform 16 from its position closing the bottom of the coin chute 15 and thus allow the coin previously resting on the platform to drop into the coin chamber 40 where it rests upon a further stationary platform 47. A single coin only is allowed to pass from the coin chute 15 to the coin chamber 40 at any one time by reason of the entry of the two pins 45 into the coin chute 15 by passing through the apertures 46 in consequence of the sideways movement of the plate 41 on which they are carried. These pins when projecting into the coin chute are adapted to pass transversely across the thickness dimension of the latter at such a distance above the removable platform 16 as to just miss engagement with any coin of the largest usable diameter (say a penny) located on the said platform and to enter into engagement with any coin or coins disposed above this lower coin and so hold such upper coin or coins by a lateral pressure directed towards the opposite side wall of the coin chute 15. Any coin or coins located above the lowest coin situated on the platform 16 will thus be held until the coin chamber 40 is again returned to the position shown where the platform 16 closes the bottom of the coin chute and the pins 45 removed from within the chute.

Fig. 3 illustrates how any coin or coins above the lowest coin is held by the pins 45 and also makes it clear that the range of coin sizes permissible for effective operation of such mechanism must be such that two of the smallest diameter coins *a* placed edge to edge in the coin chute are of a greater over-all dimension than a single coin *b* of the largest usable diameter, for instance two sixpences have a greater over-all vertical dimension than one penny if the coin chamber is little wider than a penny.

The third shaft 34 which is also moved one revolution during each operative cycle by the motor 24 carries a cam 48 secured thereto that is engaged by a cam lever 49 which although loosely mounted upon a rock shaft 50 is connected to the latter by way of a resilient linkage such as the coiled spring 51. The rock shaft 50 which is rotatably mounted in suitable bearing extensions from the frame plate 10 has rigidly secured thereto a caliper lever 52 provided with an extension 53 at its free end which is adapted to operate through slots 54 in the walls of the coin chamber 40. The caliper lever 52 upon rotation by movement of the rock shaft 50 acts to caliper the coin within the chamber 40 against a transverse rear wall 55 of the chamber. The rock shaft 50 also has secured thereto a further lever 56 which controls the movement of a slide 57 mounted upon suitable guide rods 58 for movement in a direction parallel with the shaft 34. The movement of the slide 57 by the lever 56 is opposed by a light spring 59 anchored at its other end (not shown) to the main frame plates. The slide 57 is provided with a slotted gauge plate 60 provided with slots disposed in suitable relative positions corresponding to the diameter ratios of the different usable coins when located and calipered in the coin chamber 40 for instance for a shilling, sixpence and a penny and possibly also a twelve-sided threepenny piece. These slots co-operate with a testing lever 61 which moves only in a plane transverse to that of the movement of the slide 57 in a manner hereinafter described and controls the operation of the crediting mechanism according as to whether the said lever 61 can or cannot enter

one of the slots in the gauge plate. The testing lever 61 is fastened to a shaft 68a and moves therewith. The slide 57 is also provided with an operating fork 62 engaging a grooved collar 62a secured to a pinion 63 slidably mounted upon a square section shaft 64. The pinion 63 will thus be moved axially along the shaft 64 to an appropriate position in accordance with the position taken up by slide 57 due to the movement of rock shaft 50 which latter is determined by the engagement of the extension 53 of the calipering lever 52 with a coin located within the coin chamber 40. Any movement of the cam lever 49 by the cam 48 in excess of that necessary to effect the coin calipering and movement of the slide 57 and gear 63 will be absorbed by the spring 51. The shaft 64, which by reason of its cross-sectional shape is always in driving connection with the pinion 63, is connected by suitable gearing such as the gear 64a shown to the registering, crediting or other mechanism of the prepayment device.

The pinion 63 when located by the slide 57 in any one of the positions of the latter in which the testing lever 61 is aligned with and can enter one of the slots of the gauge plate part 60, is arranged to be in alignment with an appropriately toothed section of a multi-section gear wheel 65 loosely mounted upon the shaft 34. The number of teeth in each section of the gear wheel 65 is appropriately chosen to effect the requisite movement of the pinion 63 consequent upon the particular setting of the latter in accordance with the diameter of the particular coin located within the coin chamber 40. For instance the number of teeth for the position corresponding to one shilling will be twelve, to a sixpence six and to a penny one.

The shaft 34 also carries a further cam 66 which operates upon an abutment 67 secured to a lever 68 loosely mounted upon the shaft 68a carried in suitable bearings in the frame plates 10 and 11. This lever 68 is urged by the spring 77 in face-to-face manner against a further lever 69 which is rigidly secured to the shaft 68a. The two levers 68, 69 are normally registered with one another by means of a cam-faced abutment 70 carried by the lever 69 (see Fig. 2) and entering into engagement with a corresponding recess in the lever 68. The lever 68 is provided with a further extension 71 which enters a grooved collar 72 secured to a sleeve 73 provided with a square-section bore in engagement with a correspondingly square-sectioned portion of the shaft 34. The sleeve 73 is provided with a flange 74 at its rear end. This flange carries a projecting stud 74a which is adapted to engage a similar stud 75 projecting from a flange 76 secured to the multi-section gear wheel 65. The lever 68 is normally urged into engagement with the lever 69 by the spring 77 on the shaft 68a and when in this position the lever 68 by reason of its engagement with the grooved collar 72 moves the flange 74 and stud 74a to a position where the latter can come into driving engagement with the stud 75, so that rotation of the shaft 34 is transmitted through the sleeve 73 to the gear wheel 65 and the rotation of the latter transmitted in turn to the pinion 63.

This driving connection, however, is controlled by the coin calipering operation in the following manner. The positive movement of the lever 63 by the engagement of the abutment 67 with the cam 66 causes the rocking of the two levers 68, 69 about the axis of the shaft 68a. The test

lever 61, secured to the shaft 68a is thereby moved to engage the gauge plate 60. If the test lever 61 enters one of the slots in this gauge-plate the total movement imparted to the lever 68 by the cam 66 is also transmitted to the second lever 69 and the sleeve 73 is maintained in a position where it effects a positive driving connection between the shaft 34 and the multi-gear unit 65 and the crediting mechanism is subsequently actuated to an extent dependent upon the particular section of the gear 65 which has been selected by the coin calipering operation. In the event, however, of the coin under test being of a diameter different from any of those associated with the respective slots of the gauge plate 60 then the test lever 61 will not enter one of the slots and will in consequence prevent rocking movement of the lever 69 to the same extent as the lever 68 adjacent thereto. The enforced movement of the latter lever by the cam 66 causes the cam-faced abutment 70 (see Fig. 2) to ride up out of the corresponding recess in the other lever and in consequence to cause axial separation of the lever 68 in a forward direction (Fig. 1). This separation effected against the action of the spring 77 is in turn transmitted by the grooved collar 72 to the sleeve 73 so as to cause the withdrawal of the stud 74a from the path of the stud 75 associated with the gear member 65. The latter gear is, therefore, left out of driving connection with the shaft 34 whenever the coin calipered within the coin chamber 40 is not one of the predetermined diameters in accordance with the positions of the slots in the gauge plate 60 and in consequence although the continued operation of the mechanism is permitted to deal with the inserted coin and to discharge it, no movement is imparted to the crediting mechanism.

The continued rotation of the shafts 29, 33 and 34 beyond the position at which calipering of the coin and the subsequent testing movement of the test lever 61 with the consequent coupling or uncoupling of the drive to the multi-gear 65 is effected, causes the cams 38 and 39 to act positively to return the coin chamber 40 to its original position (i. e. to the left, Fig. 1) whereupon the bottom of the coin chamber 40 is removed from alignment with the platform 47 and any coin therein allowed to fall therethrough. At the same time as this return movement is taking place an arm 78 also secured to the shaft 33 operates through slots 79 in the walls of the coin chamber 40 to engage forcibly with any coin that may have lodged or be deliberately retained therein. In this way the said coin is either forcibly ejected or the mechanism is arrested and put out of further operation until cleared by an authorized person.

It is usually desirable to return to the user or at least to segregate any coin which has failed to effect crediting of the mechanism and for this purpose the present device is provided with the following mechanism. Secured to the sleeve 73 is a further cam plate 80 which is adapted, when the sleeve 73 is displaced forwardly due to an unsatisfactory coin, to engage an extension 82 of a hinged deflector plate 83 pivotally mounted immediately below the coin chamber 40. If this deflector plate, or gate, 83 is moved to the right by engagement of the extension 82 with the cam plate 80 any coin released from the coin chamber 40 is directed down the left-hand side of the plate 83 either to a returned coin chute or a chamber. If on the other hand the coin

being dealt with is a satisfactory one the sleeve 73 is not moved axially by separation of the plates 68, 69 and the extension 82 is not moved by engagement with the cam 80 and the deflector plate 83 is held to the left by the spring 81 as shown in Fig. 1, so that any coin proceeding from the chamber 40 is directed on the right-hand side of the deflector plate 83 to a coin till.

A complete cycle of operation of the device is as follows, assuming that the various parts occupy the positions shown in Figure 1 of the drawings.

The coin which is inserted in the aperture 14 falls into the coin chute 15 where it engages nose 17 of the lever 18 and effects rotation of the spindle 20. The arm 21, attached to the spindle 20, serves to close the contacts 22, thereby energizing the driving motor 24. The cam 31 is immediately rotated with the shaft 29 to move the projection 32 so as to permit closure of contacts 30, shunting contacts 22 and insuring that the motor 24 will remain energized until the cam 31 has rotated through one complete revolution.

The downward movement of the coin in the coin chute 15 is arrested by the platform 16 which, it will be recalled, extends from the plate 42 that forms a part of the coin chamber 40.

The shaft 33 is rotated together with the shaft 29 carrying with it cam 39 the nose of which engages the plate 41 and moves the coin chamber 40 so that the platform 16 uncovers the bottom of the coin chute 15 thereby permitting the coin to fall into the coin chamber 40 where its fall is arrested by the platform 47.

At the same time that the coin chamber 40 is moved, the pins 45 serve to prevent any additional coins from falling into the coin chamber 40, as previously described.

The shaft 34 is rotated together with the shafts 29 and 33 carrying with it cam 66 into the recess 66a of which the abutment 67 moves. This is accompanied by a movement of the lever 61 out of the slot in the gauge plate 60 in which it was left at the end of the preceding cycle of operation. The slide 57 is then retracted by spring 59 until it engages the arm 56.

The cam 48 on the shaft 34 is also rotated and it engages the upper end of the cam lever 49 which rotates the shaft 50 through the spring 51 to move the extension 53 of the caliper lever 52 into engagement with the coin in the coin chamber 40. The extent of movement of the shaft 50 is determined by the diameter of the coin in the coin chamber 40 and consequently the lever 56, attached to the shaft 50, assumes a corresponding position. The slide 57, having been previously released by movement of the test lever 61, is moved by the lever 56 to a position corresponding to the diameter of the inserted coin.

The abutment 67 remains in the recess 66a of the cam 66 for a time sufficient to permit the slide 60 to assume its position in accordance with the diameter of the coin in the coin chamber 40. After the slide 60 has been moved to a position corresponding to the diameter of the coin in the coin chamber 40, the abutment 67 rides out of the recess 66a in the cam 66 and tends to rotate the shaft 68a through the spring 77. The test lever 61 rotates with the shaft 68a and is moved into one of the notches in the gauge plate 60 in the event that a proper coin has been inserted.

While the test lever 61 is being moved out of and into one of the slots in the gauge plate 60

and the slide 57 is being moved to a position in accordance with the diameter of the inserted coin, the multi-section gear wheel 65 is being rotated with the shaft 34 since the pin 74a on the sleeve 73 is in engagement with the pin 75 on the multi-section gear wheel 65. However, no rotation of the pinion 63 takes place for the reason that the multi-section gear wheel 65 must be rotated through approximately 90° before any of its teeth can engage the pinion 63.

In the event that an improper coin has been inserted, the test lever 61 will not engage any of the slots in the gauge plate 60 and consequently the sleeve 73 will be moved, as previously described, so as to disengage the pin 74a from the pin 75. A slight movement of the multi-section gear wheel 65 will take place but it will be insufficient to engage the pinion 63. The multi-section gear wheel 65 will remain in this position with the pin 75 slightly in advance of the pin 74a but adapted to be engaged thereby when the next proper coin is inserted in the device.

It will be understood that the particular portion of the multi-section gear wheel 65 that engages the pinion 63 will depend upon the position of the latter as controlled by the position of the slide 57. The registering, crediting, or other mechanism of the prepayment device will then be operated by the gear 64a in accordance with the value of the inserted coin.

Since the shaft 34 rotates only through a single revolution for one cycle of operation, the test lever 61 remains in the slot in the gauge plate 60 in which it has previously been moved since the abutment 67 continues to ride upon the other cam surface of the cam 66 until a complete revolution of the shaft 34 is effected.

During the latter part of the revolution of the shaft 34, the cam 48 engages the upper end of the cam lever 49 and rotates the shaft 50 to the initial position where the extension 53 of the caliper lever 52 is moved to the position shown in Figure 1 so that it does not interfere with the entrance of the next coin into the coin chamber 40.

Near the end of the revolution of the shaft 29, the cam 38 moves the coin chamber 40 back to its initial position so that its lowest side is no longer closed by the platform 47. The coin then is free to fall downwardly into the coin box. The pins 45 are retracted to permit the next coin to pass through the coin chute.

After the coin chamber 40 has been returned to its initial position, the arm 78 attached to the shaft 33 moves downwardly through the coin chamber 40 to forcibly eject the coin therefrom in the event that it has not dropped out of the same. The device is then in condition to repeat the foregoing cycle under the control of the next coin.

The return of the coin chute (to the left Fig. 1) by the cams 38, 39 at the end of the cycle of operations releases the coin-holding pins 45 from entry in the coin chute and allows the next coin, if any, to be released and to fall on to the removable platform 16 thereby setting up a fresh train of operations. It will be understood that suitable springs and the like are employed where necessary for returning the various members to their normal or initial positions.

If found desirable some means may be provided for cutting off the power supply to the motor in the event of jamming of the mechanism during a cycle of operation. One manner of effecting this operation is shown in Fig. 4, in which the

current supply to the motor 24 is arranged to be opened by means of a rocking lever 84 which carries a gear wheel 85 located between the motor pinion 27 and the gear 28. The locking or jamming of the mechanism causes, by the continued rotation of the motor shaft 25, the attempted rotation of the gear wheel 85 carried by the rocking lever 84 around the locked gear 28 connected to the drive shaft 29 in the direction of the arrow c. This movement of the rocking lever is arranged to cause a circuit opening of the supply leads 23 at the contacts 86.

An alternative arrangement is shown in Fig. 5 in which a bi-metal strip 89 anchored at one end is surrounded by a heating coil 90 connected in the motor circuit. The strip 89 normally or when cool engages in a step 91 of a trip lever 92. The lever 92 carries one contact of a pair of contacts 93 in series with the motor supply and is urged in a direction to cause opening of the said contacts 93. Under normal circumstances the strip 89 serves to retain the lever 92 in its circuit closing position but upon prolonged energisation of the motor for instance due to jamming the coil 90 causes heating of the strip with consequent deflection to cause tripping of the lever 92 and opening of contacts 93. The meter cannot again be used until fault is cleared by an authorised person.

It may also be desirable to incorporate means for preventing further operation of the mechanism when the user's credit is at the maximum amount recordable by the credit mechanism. In a constructional form of carrying this feature into effect a movable member, for instance the member 87 shown diagrammatically in Fig. 1 associated with the credit recording mechanism of the device, is arranged to engage and open a further pair of contacts 88 also inserted in the circuit of the leads 23 supplying current to the driving motor 24. The motor 24 will thus remain deenergized, even if coins are inserted, until the consumer's credit has decreased sufficiently to remove the arm 87 from engagement with the contacts 88.

I claim:

1. In a prepayment mechanism for an electricity meter, an auxiliary driving power source for effecting all of the operations normally performed manually, a coin-testing chamber, a coin-calipering member movable in said coin-testing chamber for measuring the diameter of a coin inserted therein, timed and resilient coupling means for connecting said movable calipering member to said power source for operation thereby, gauging means controlled by the permitted movement of said coin-calipering member, means controlled by the setting of said gauging means for determining whether the calipered coin is usable or not, credit-registering mechanism driving means, a movable gear member in driving connection with said credit-registering mechanism driving means, a multi-section gear wheel, means operated by said gauging means for setting said movable gear member with relation to said multi-section gear wheel in accordance with the diameter of the calipered coin and a coupling device controlled by the means which determines whether the calipered coin is usable for connecting said multi-section gear wheel to said power source so as to effect an appropriate operation of said credit-registering mechanism driving means.

2. A prepayment mechanism operated automatically on the insertion of coins or the like therein without any manual operation other than

insertion required from the insertor which comprises, in combination, coin receiving means for receiving coins of different sizes each corresponding to a different value, coin presence responsive means, driving means controlled by said coin presence responsive means, coin calipering means operatively connected with said driving means, coin feed means operatively connected with said driving means and adapted to feed a coin from said coin presence responsive means into said coin calipering means, a multi-section gear wheel, a pinion slidably mounted and adapted to be moved into mesh with different sections of said multi-section gear wheel, gauge means operatively interconnecting said coin calipering means and said pinion, testing means operatively connected with said driving means and adapted to cooperate with said gauge means, clutch means interconnecting said multi-section gear wheel and said driving means, clutch control means operatively interconnecting said clutch means with said testing means, and crediting mechanism driving means operatively connected with said pinion, said pinion being slid into mesh with a section of said multi-section gear wheel determined by the size of the coin calipered, and said testing means only letting in said clutch means when the coin calipered is one on which the prepayment mechanism is adapted to operate.

3. A prepayment mechanism operated automatically on the insertion of coins or the like therein without any manual operation other than insertion required from the insertor, which comprises, in combination, coin receiving means for receiving a plurality of coins of different sizes each corresponding to a different value, coin presence responsive means, driving means controlled by said coin presence responsive means, coin calipering means operatively connected with said driving means, cyclically operable coin feed means operatively connected with said driving means, coin retaining means operatively connected with said cyclically operable coin feed means to retain all of the coins in said coin receiving means except the most advanced coin until after each cycle of operation of the coin feed means has been completed and said most advanced coin discharged, coin discharging means operatively connected to said driving means for discharging each coin after calipering thereof, a multi-section gear wheel, a pinion slidably mounted and adapted to be moved into mesh with different sections of said multi-section gear wheel, gauge means operatively interconnecting said coin calipering means and said pinion, testing means operatively connected with said driving means and adapted to cooperate with said gauge means, clutch means interconnecting said multi-section gear wheel and said driving means, clutch control means operatively interconnecting said clutch means with said testing means, and crediting mechanism driving means operatively connected with said pinion, said pinion being slid into mesh with a section of said multi-section gear wheel determined by the size of the coin calipered and said testing means causing driving connection through said clutch control means only when the coin calipered is one on which the pre-payment mechanism is not adapted to operate and after the cycle of operation of said prepayment mechanism has been completed with one coin, the same cycle being automatically repeated with each of the remaining plurality of coins inserted in said coin receiving means.

4. A cyclically operable prepayment mechanism

nism automatically operable on the insertion of coins or the like therein with no other manual operation required of the inserter which comprises, in combination, a coin chute adapted to receive a plurality of coins of different sizes each corresponding to a different value, a starting switch closed by the presence of a coin in said coin chute, a motor for driving said cyclically operable prepayment mechanism adapted to be started by said starting switch, coin calipering means operatively connected with said motor, coin feed means adapted to feed the coin closing said starting switch to said coin calipering means on each cycle of operation of the prepayment mechanism, coin retaining means operatively connected with said motor and adapted to retain all inserted coins within said coin chute, except the most advanced coin, from closing said starting switch until after each cycle of operation of the prepayment mechanism is completed, coin discharging means operatively connected to said motor means for discharging each coin after it has been calipered, a multi-section gear wheel, a clutch operatively interconnecting said multi-section gear wheel and said motor, a pinion slidably mounted and adapted to be moved into mesh with different sections of said multi-section gear wheel, gauge means operatively interconnecting said coin calipering means and said pinion for moving said pinion into mesh with a gear section corresponding to the size of the coin calipered, coin testing means adapted

to cooperate with said gauge means depending on the position thereof, clutch control means operatively interconnecting said clutch means with said testing means, and crediting mechanism driving means operatively connected to said pinion, said pinion driving said crediting mechanism driving means each cycle an amount proportional to the value of the coin being calipered and said coin test means through said clutch control means causing driving connection through said clutch means only when the coin calipered is of a size on which the cyclically operable prepayment mechanism is designed to operate.

5. In a prepayment mechanism adapted to be operated by coins of different sizes of which the diameter of the smallest usable coin is greater than the radius of the largest usable coin, in combination, a coin chute with a coin insert aperture and a coin outlet opening, gate means for said coin outlet opening operatively controlled by the prepayment mechanism, and coin retaining means, and means for moving said gate means to release a coin from said coin chute and simultaneously move said retaining means into operative position, said coin retaining means comprising holding means operable in said coin chute to hold any coin from further movement therethrough if any part thereof lies at a greater distance from said gate means than the diameter of said largest usable coin.

ALFRED HENRY WICKHAM.