Dec. 14, 1954 R. T. TRIER ET AL 2,696,899

TIME SELECTING AND COIN HANDLING MECHANISM

Filed Aug. 22, 1949 5 Sheets-Sheet 1

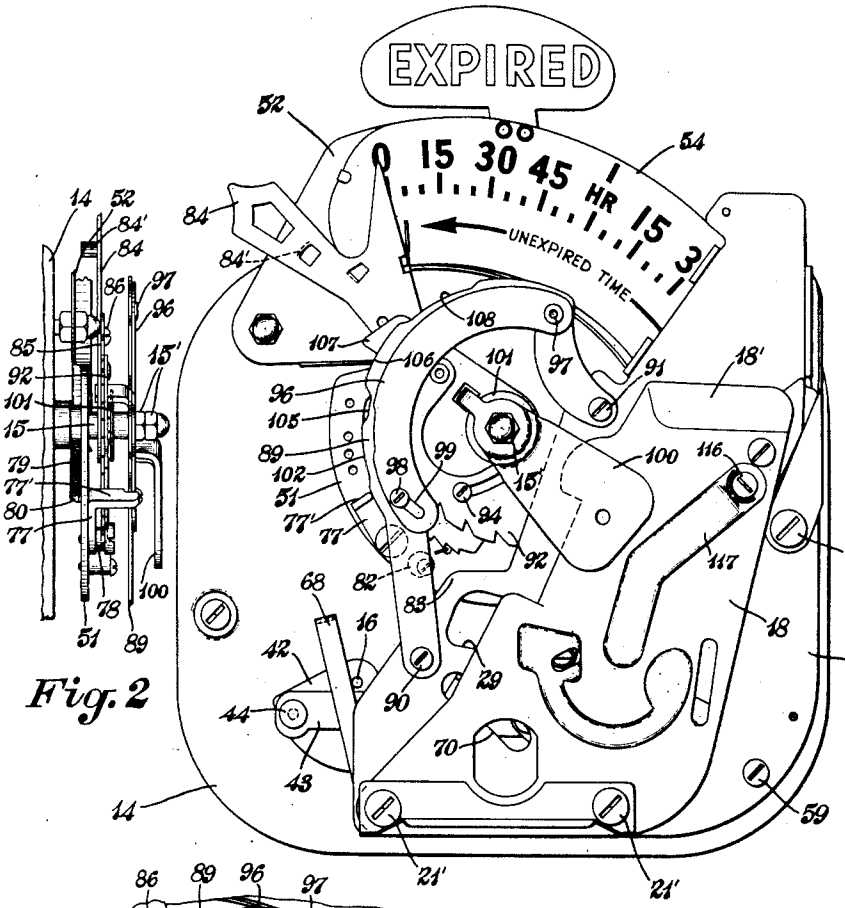
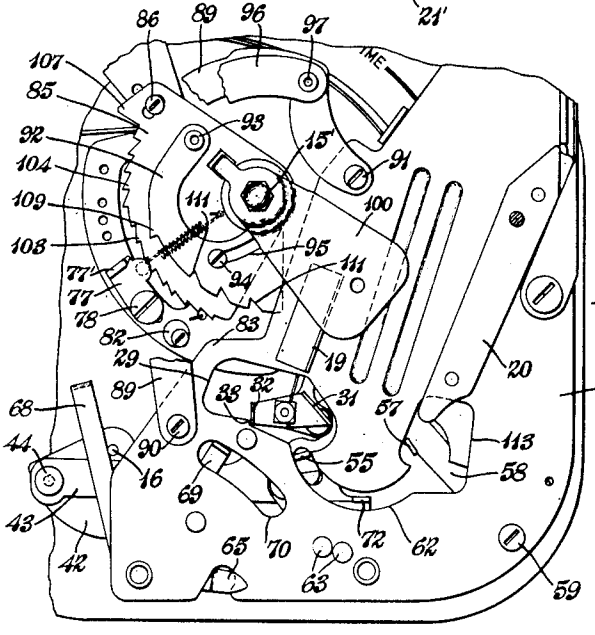


Fig. 1

Fig. 2



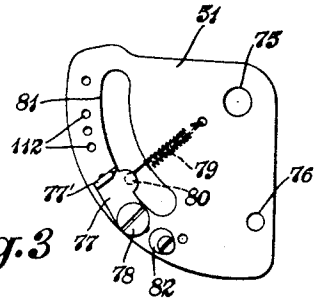


Fig. 3

Fig. 4

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TIME SELECTING AND COIN HANDLING MECHANISM

Filed Aug. 22, 1949 5 Sheets-Sheet 2

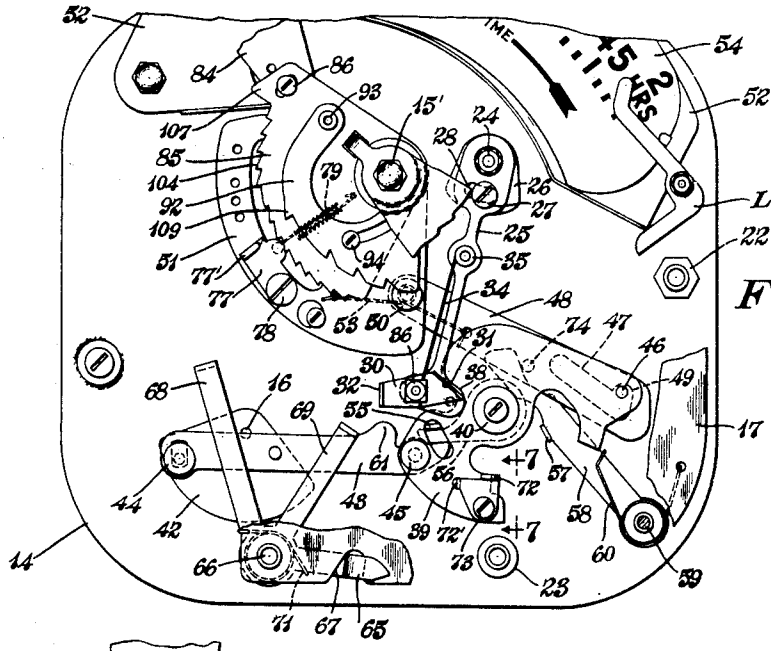


Fig. 5

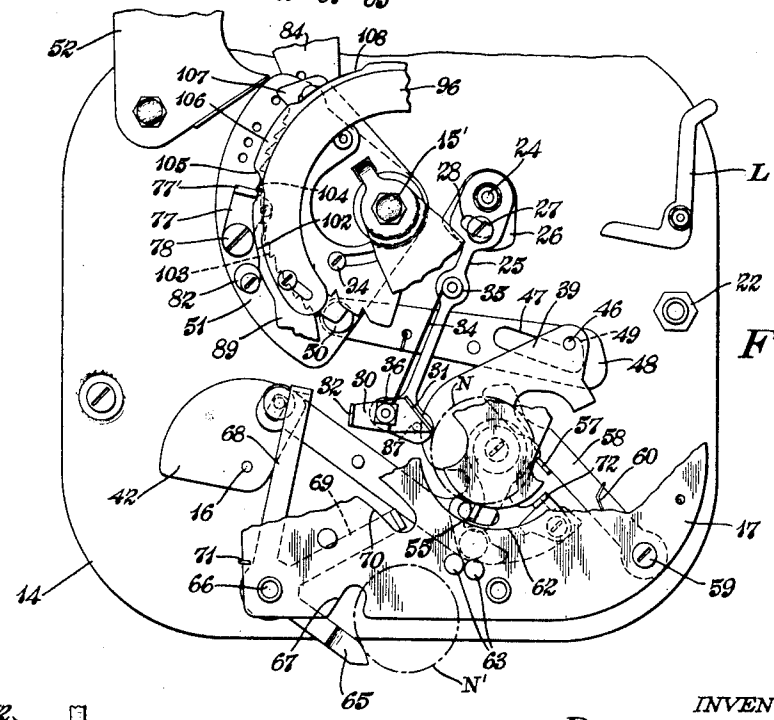


Fig. 6

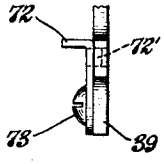


Fig. 7

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TIME SELECTING AND COIN HANDLING MECHANISM

Filed Aug. 22, 1949 5 Sheets-Sheet 3

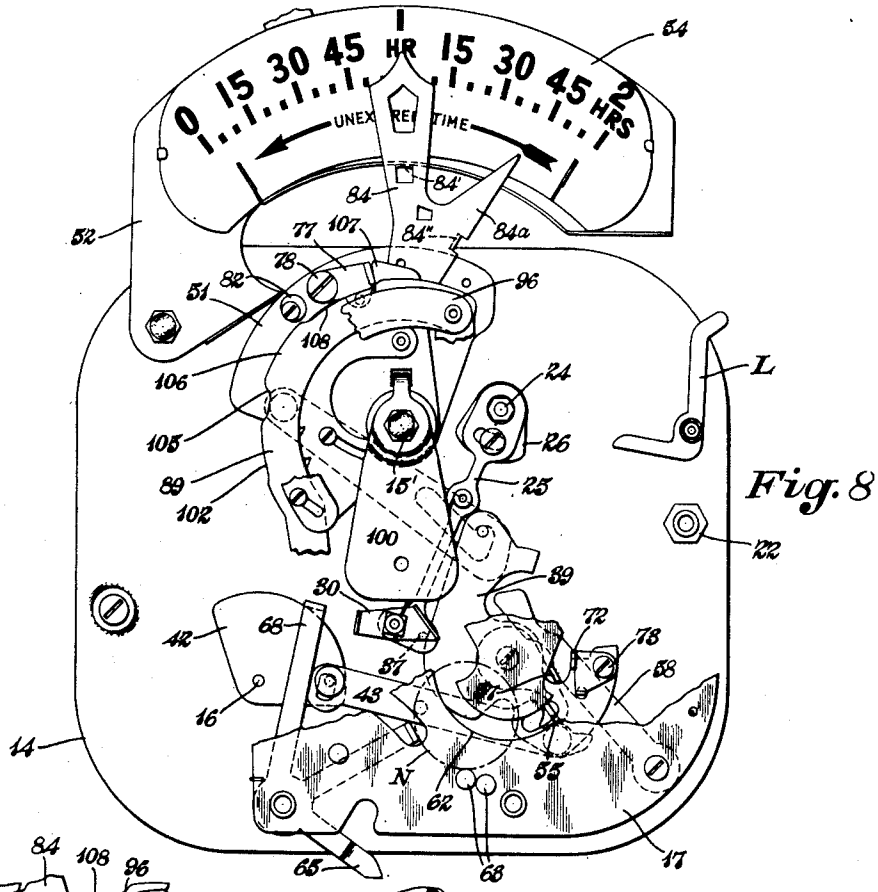


Fig. 8

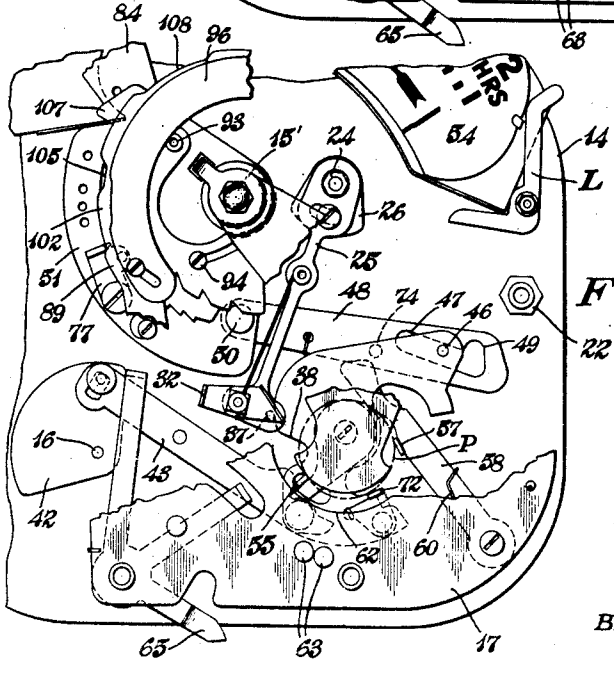


Fig. 9

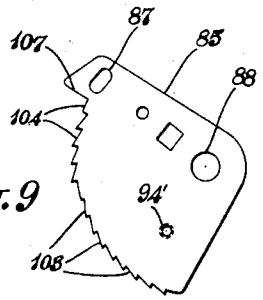


Fig. 10

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Dec. 14, 1954 R. T. TRIER ET AL 2,696,899

TIME SELECTING AND COIN HANDLING MECHANISM

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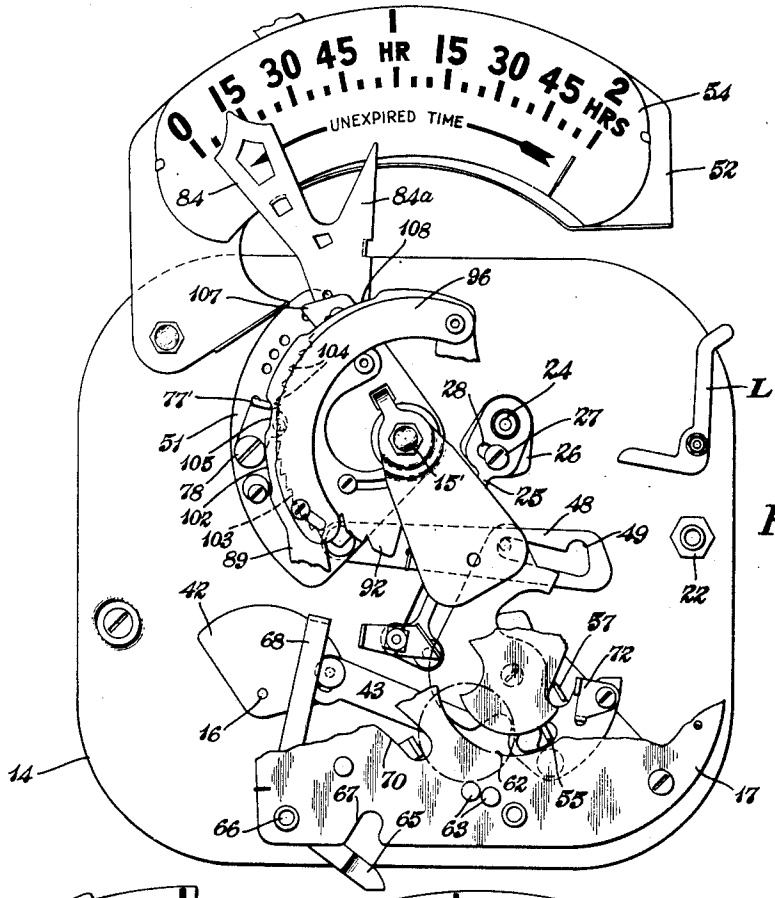


Fig. 11

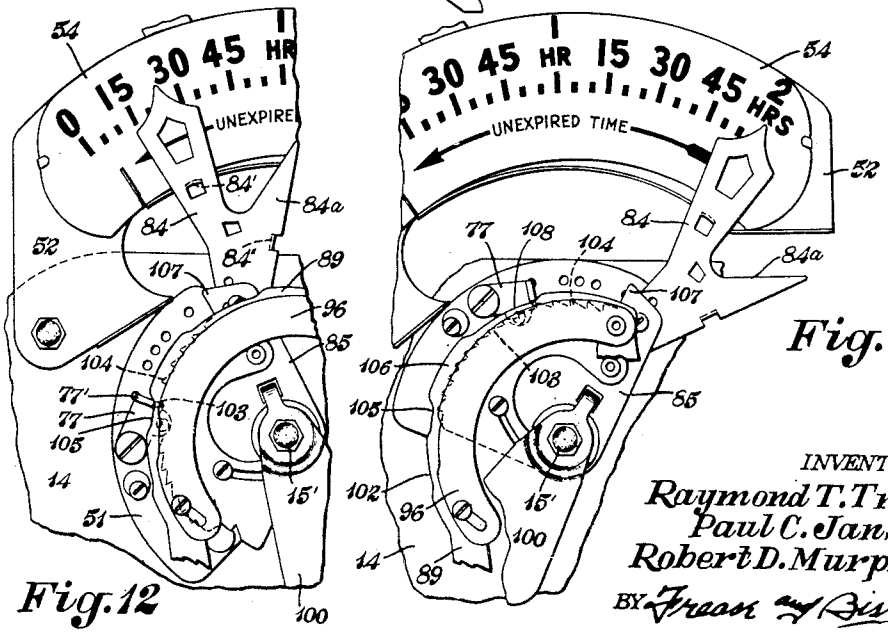


Fig. 12

Fig. 13

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TIME SELECTING AND COIN HANDLING MECHANISM

Filed Aug. 22, 1949 5 Sheets-Sheet 5

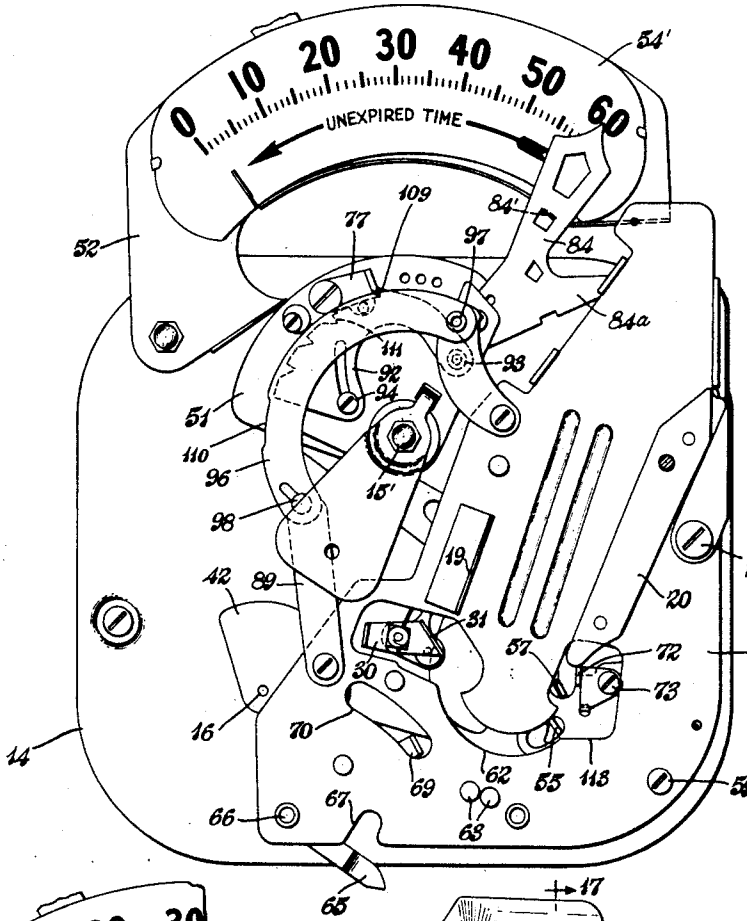


Fig. 14

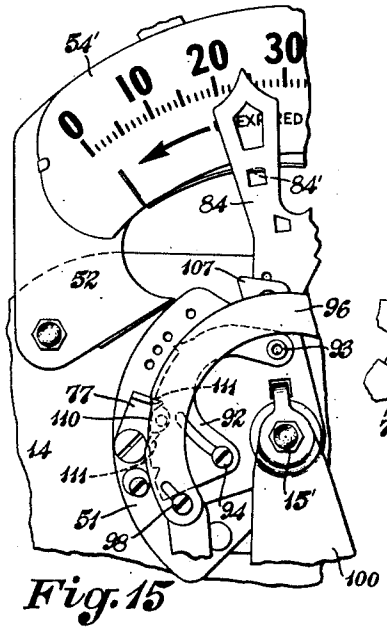


Fig. 15

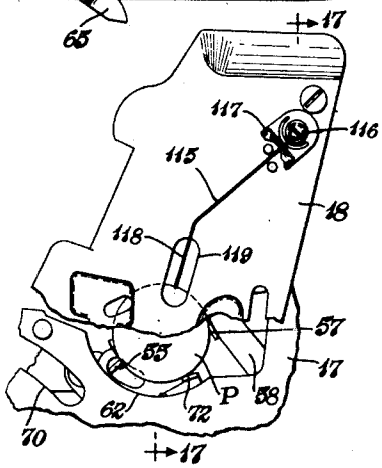


Fig. 16

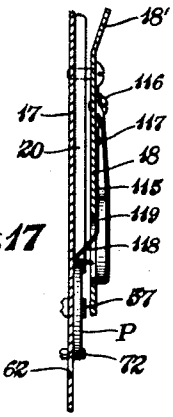


Fig. 17

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Patented Dec. 14, 1954

2,696,899

TIME SELECTING AND COIN HANDLING MECHANISM

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Application August 22, 1949, Serial No. 111,648

15 Claims. (Cl. 194—1)

The invention relates generally to coin operated parking meters of the general type shown in the McGay Patent No. 2,284,221, and more specifically to novel adjustable time selecting and coin handling mechanism embodied in such parking meters.

In prior meters of this type, if for example, it is desired to change the meter from one operated by five pennies to register five accumulated 12-minute intervals and operated by a nickel to register 1 hour, to a meter operated by ten pennies to register ten accumulated 12-minute intervals and operated by one or two nickels to register 1 or 2 hours, or vice versa; it is necessary to remove and replace certain time selecting cam slides and ratchet plates.

This operation requires not only the services of a skilled mechanic, but also requires that he transport the proper cam slides and ratchet plates to and from the meters, which are usually in service, and frequently the change is required in large numbers of meters which are already installed and in operation.

Moreover, in prior meters of this general type, if for example, it is desired to change the meter from a straight nickel-operated meter to one operated by pennies and nickels, or vice versa; it is necessary selectively to attach or remove a spring-actuated coin-supporting rocker arm and its spring and spring-retaining cap. This operation also requires the services of a skilled mechanic and entails delicately adjusted parts which have a short life.

It is a general object of the present invention to provide novel adjustable time selecting and coin handling mechanism whereby the meter may be changed or adjusted quickly to operate over a different number of time intervals and for different accumulated time periods, and to handle coins of different denominations for the proportionate time periods.

Another and more specific object is to provide improved sets of cam slides and ratchet plates which are selectively adjustable for guiding and engaging a ratchet pawl to register different time intervals and accumulated time periods.

A further object is to provide an improved rocker arm for supporting a penny in position to control the stroke of the flag cam plate which advances the time indicator, said rocker arm being attached directly to the release cam which is part of the coin controlled mechanism.

A still further object is to provide novel coin-retainer means for yieldingly maintaining a penny in position to vary the stroke of a flag cam plate which advances the time indicator over different intervals.

Finally, it is an object of the present invention to provide an improved parking meter of the type shown in the said McGay patent, said meter being adapted to meet a greater variety of parking conditions and requirements, while greatly decreasing the amount of maintenance, repair and adjustment requiring the services of a skilled mechanic.

These and other objects are accomplished by the parts, improvements, combinations and arrangements comprising the present invention, a preferred embodiment of which is shown in the accompanying drawings and described in the specification as exemplifying the best known mode of carrying out the invention; the invention being set forth in general terms in the following general statement, and the scope of the invention being defined in the appended claims.

In general terms, the invention may be stated as including a pair of toothed ratchet plates rotatable on the axis of the flag cam plate carrying the ratchet pawl which advances the time indicator, said ratchet plates being adjustable relative to each other for selective engagement by the pawl, and a pair of arcuate cam slides mounted on the coin guide plate of the meter and adjustable relative to each other to selectively slidably contact the pawl to guide it into engagement with the teeth on one of said ratchet plates, there being a rocker arm attached to the release cam of the mechanism for supporting a penny in position to vary the stroke imparted to the flag cam plate, and coin-retaining means for yieldingly holding the penny in stroke-varying position during the initial movement of the coin control mechanism.

Referring to the drawings forming part hereof, in which is a preferred embodiment of the invention is shown by way of example;

Figure 1 is a front elevation of the improved parking meter mechanism embodying the present invention, with the time scale and indicator in the off position which they occupy before a coin is inserted.

Fig. 2 is a fragmentary side elevation thereof;

Fig. 3 is a fragmentary front elevation similar to Fig. 1, with the coin cap plate removed, and parts of the cam slides broken away to show the ratchet plates;

Fig. 4 is a detached front elevation of the flag cam plate carrying the ratchet pawl;

Fig. 5 is a fragmentary front elevation similar to Fig. 3 with the coin guide plate removed to expose the coin control mechanism;

Fig. 6 is a similar view showing the mechanism at an intermediate stage of its cycle as controlled by a nickel coin, the ratchet pawl being guided by the lower cam slide for engaging the lower ratchet plate;

Fig. 7 is a fragmentary side view of the rocker arm on the release cam plate, as on line 7—7, Fig. 5;

Fig. 8 is a similar view showing the mechanism at an advanced stage of its cycle of operation as controlled by a nickel coin, with the indicator advanced to the 1-hour mark on a 2-hour scale;

Fig. 9 is a fragmentary view similar to Fig. 6 showing the manner in which a penny coin varies the stroke of the resetting mechanism;

Fig. 10 is a detached front elevation of the bottom ratchet plate;

Fig. 11 is a view similar to Fig. 8 showing the mechanism at an advanced stage of its cycle as controlled by a penny coin, the indicator being advanced to register 12 minutes for the first penny coin inserted;

Fig. 12 is a fragmentary view similar to Fig. 11 showing the position of the ratchet pawl when the indicator has been moved by the second penny to register 24 minutes;

Fig. 13 is a similar fragmentary view showing the indicator advanced to register 2 hours.

Fig. 14 is a view similar to Fig. 8, showing the indicator advanced to register 1 hour on a 1-hour time scale, the upper cam slide and the upper ratchet plate being adjusted into position to guide and engage the ratchet pawl;

Fig. 15 is a fragmentary view similar to Fig. 14 showing the time indicator advanced by depositing the second penny to register 24 minutes on the 1-hour scale;

Fig. 16 is a fragmentary front elevation of the mechanism as controlled by a penny, with the coin cap plate being broken away, and the coin retainer cover being broken away to show the retainer spring holding a penny in link-shifting position; and

Fig. 17 is a transverse sectional view substantially on line 17—17 of Fig. 16.

Similar numerals refer to similar parts throughout the drawings.

In the drawings a suitable clockwork mechanism is housed in the case **14** for driving the resetting mechanism and driving the indicator shaft **15** counterclockwise in the same manner as in the McGay Patent No. 2,284,-221. Nuts **15'** are screwed on the outer end of the indicator shaft for securing the indicator assembly thereon with a frictional engagement which allows the indicator assembly to be turned clockwise on the shaft **15** while the shaft is turning in the opposite direction or is stationary.

As in the McGay patent, the clockwork is operatively connected to a shaft 16 which drives the resetting mechanism through a cycle for one rotation of the shaft each time the clockwork is tripped by the insertion of a coin into the meter. The coin drops from the coin-receiving slot of the meter housing (not shown) into a slot or guideway formed between the rear coin guide plate 17 and the front coin cap plate 18, the top of plate 18 being outwardly flared at 18' (see (Fig. 17), and the coin is guided by a flange 19 secured on the plate 17 at one side and a guide plate 20 secured to plate 17 at the other side. The rear plate 17 is mounted on the case 14 in spaced relation thereto by screws 21 and 21' extending through the plate and screwed into spacer blocks 22 and 23 on the case. The front cap plate 18 is mounted on the rear plate 17 by means of the screws 21' with suitable spacers between the plates.

The clockwork mechanism is controlled by a suitable brake (not shown) actuated by a trip shaft 24 extending through the case 14. A trip lever 25 is mounted on the trip shaft for rotating the shaft to release the brake and start the clockwork to drive shaft 16, and the trip lever extends downwardly in front of the coin guide plate 17 in a position to be actuated by a coin dropping between the plates 17 and 18 and the guides 19 and 20. The upper portion of the lever 25 is preferably adjustably connected to a plate 26 fixed on the shaft 24, by means of a screw 27 extending through a slot 28 in the lever and threaded into the plate 26, for adjusting the position of the lower end of the lever. A locking arm 30 is pivoted at its intermediate portion on the lower end of the trip lever 25, and has angular flanges 31 and 32 at its ends, the flange 32 being normally engaged, when the meter is in off position as shown in Fig. 3, with a corner or stop 33 formed on the edge of an opening 29 in the guide plate 17. Thus the trip lever 25 is prevented from accidentally starting the clock mechanism, if the meter is jarred or bumped.

When a coin drops down the guideway between the plates 17 and 18, the coin engages the flange 31 and rocks the arm 30 to raise the flange 32 over the corner 33 and the coin pushes the arm 30 and the trip lever laterally, as indicated in Fig. 6, to release the brake and allow the clockwork to rotate shaft 16. Means for yieldingly holding the arm 30 in the position of Fig. 3 preferably consists of a spring wire 34 anchored by a rivet 35 on the lever and extending at its lower end through a square 36 which is secured on the arm 30 and pivoted on a stud on the lower end of the lever 25.

A stop pin 37 extends rearwardly from the lower end of the trip lever 25 and normally is positioned in a notch 38 in the edge of a release cam plate 39 pivoted at 40 on the case 14. When the drive shaft 16 is rotating, the pin 37 rides the edge of the plate 39 (Fig. 6), and when the shaft has completed one revolution, the resetting mechanism has completed a cycle, and the pin 37 again enters the notch 38, stopping the resetting mechanism and allows the trip lever 25 to return to its original position, as shown in Fig. 3.

The drive shaft 16 for the resetting mechanism has secured thereon a sector plate 42, and the sector plate 42 has a pitman link 43 pivotally connected thereto at 44, as best shown in Fig. 5. The other end of the link 43 is pivotally connected at 45 to the lower end of the release cam 39. Hence rotation of the sector plate 42 by the drive shaft 16 in a clockwise direction will oscillate the release cam plate 39, first in a counterclockwise direction. At the upper end of the release cam 39 a pin 46 projects rearwardly into a slot 47 in a time selector link 48. The slot 47 is substantially L-shaped having a laterally offset portion 49 at its lower end, and in the normal off position of the resetting mechanism, the pin 46 is located in the offset portion 49 of the slot as best shown in Fig. 5.

The upper end of the selector link 48 is pivoted at 50 to the edge of a quadrant-shaped flag cam plate 51 having an arcuate cam edge for engaging and raising the flanged time scale bracket 52 of the meter to which the "Expired" flag is attached. Thus as the release cam plate 39 is rotated counterclockwise, the pin 46 will engage the shoulder formed by the offset portion 49 of the slot 47, as indicated in Fig. 6, and the selector link 48 will rotate the cam plate 51 in a clockwise position to raise the bracket 52. During the latter half of the cycle, the return stroke of the resetting mechanism will return the flag cam 51 to its original starting position, but the frictional engagement between the indicator shaft 15 and the indicator assembly will maintain the indicator assembly at its advanced position to be returned in the proper time interval by the clockwork mechanism.

The link 48 is yieldingly urged downwardly by a torsion spring 53 (Fig. 5) which encircles the pivot 50, and unless the link 48 is shifted the pin 46 will stay in the offset portion 49 of the notch of the slot during the full cycle of the resetting mechanism so that the link 48 is given its full stroke. This full stroke is utilized when a nickel coin is deposited for moving the flag cam 51 and the indicator assembly to register a full hour on the time scale 54, in the manner shown in Fig. 8.

Referring to Figs. 5 and 6, when a nickel coin N drops past the trip lever arm 30 to move it laterally and start the resetting mechanism, the coin is supported slightly below its center by two lever arms which engage substantially opposite edges of the coin. One of these arms 55 projects forwardly through an arcuate slot in the release cam 39 from the outer end of a so-called nickel lever 56 rotatable on the pivot 40, and the other arm 57 projects forwardly from a so-called lift lever 58 pivoted at 59 on the rear coin guide plate 14 and urged downwardly by a torsion spring 60. In the off position of Fig. 5, the end of the nickel lever 56 is supported by the pointed end of pitman link 43, and as the sector plate 42 rotates, the lever arm 55 is engaged by a cam projection 61 on link 43 and rotated counterclockwise around the edge of a coin, as indicated in Fig. 6, the arm 55 following the arcuate slot 62 in the rear coin plate 17.

When the lever arm 55 has rotated out from under the edge of the nickel coin, the coin rolls downwardly and comes to rest on the rivets 63 projecting forwardly from the plate 17, as shown in Fig. 8, and on the return stroke of the release cam 39, the lever arm 55 is returned by engagement with the end of the slot in the release cam through which the arm extends, and the returning lever arm 55 pushes the nickel coin laterally to roll it off the rivets 63 and drop onto the lower arm 65 of a coin release lever pivoted at 66, where the coin may be viewed through a usual observation window (not shown). Preferably, the release lever is pivoted on the under side of the plate 17, and the outer end of the arm 65 is bent outwardly to pass through a notch 67 in the plate for supporting a coin on the front side of the plate.

The release lever has two other arms, an upper arm 68 the angular end of which is engaged by the edge of the sector plate as it rotates clockwise, and an intermediate arm 69 the outer angular end of which rotates in an arcuate slot 70 in the plate 17. As the arm 68 is rotated by the sector plate 42 the arm 65 rotates downwardly to allow a previously deposited coin N' supported thereon to drop into the coin box of the meter, and as indicated in Fig. 6, this occurs before the nickel lever arm 55 has moved to the right sufficiently to allow the newly deposited nickel coin N to drop onto the rivets 63. The release lever is held in the position of Fig. 6 by engagement with the rotating edge of the sector plate 42, and in this position the angular end of the middle arm 69 prevents a nickel coin resting on the rivets 63 from rolling off the rivets until the curved edge of the plate 42 passes the arm 68 and the spring 71 returns the release lever to its starting position of Fig. 5. Thus the arm 69 of the release lever prevents accidental jamming of the coin if, for example, two coins are deposited substantially simultaneously, which might otherwise cause jamming of the coins between the lower arm 65 of the release lever and the nickel lever arm 55 on its return stroke.

If a penny coin is deposited, the sector plate 42 and release cam 39 are operated through a full cycle, but the time selector link 48 is operated through a short stroke so that the advance movement of the flag cam 51 and indicator assembly registers only a 12-minute time interval on the time scale 54. This is accomplished by shifting the link 48 so that the pin 46 travels to the upper end of slot 47 before it moves the link 48.

Referring to Fig. 9, it will be seen that a penny indicated in dot-dash lines at P will because of its smaller diameter drop down farther between the nickel lever arm 55 and the lift lever arm 57 and come to rest upon the angular end flange of a rocker arm 72 projecting forwardly through the slot 62 in plate 17 and secured by a

screw **73** (Figs. 5 and 7) on the release cam **39**. The opposite end of the rocker arm has an inturned tongue **72'** engaged in an indentation in the release cam **39** to prevent the rocker arm from turning. As the lever **55** is moved to the right by the link **43**, the penny coin P is pinched or wedged between the arm **55** and the lift lever arm **57**, with the result that the lift lever **58** is moved upwardly against the pressure of its spring, and the upper end of the lift lever **58** engages a pin **74** on the selector link **48** (see Fig. 5) to raise the link **48** and position pin **46** in the elongated portion of the slot **47**.

Thus, continued rotation of the release cam **39** will move the pin **46** to the upper end of slot **47** before the link **48** is actuated to raise the flag cam **51**. As the nickel lever arm **55** moves on around the lower edge of the penny, the penny is released from the wedging action, and the pressure of the spring **60** on the lift lever arm **58** causes the penny to spring slightly upwardly and then roll off the lever **55** to drop onto the rivets **63** from which it is rolled downwardly by the lever arm **55** on its return stroke.

Referring to Fig. 4, the quadrant-shaped flag cam **51** is mounted at the aperture **75** on the indicator shaft **15** for rotating on the indicator shaft when the cam plate **51** is rotated by the selector link **48**, the link **48** being pivoted to the cam plate **51** at the hole **76**. A ratchet pawl **77** is pivoted at the outer edge of the cam plate **51** by a screw **78**, and the pawl is urged radially inward by a spring **79** attached at its inner end to the plate and at its outer end to an inturned pin **80** secured to the pawl and extending through an arcuate slot **81** in the plate. A stop **82** is eccentrically secured to the plate adjacent to the pawl **77**, and the eccentric stop forms an adjustable abutment for engaging a corner **83** on the rear coin plate **17** when the time selector link is shifted by a penny to allow the pin **46** to move into the slot **47**, which causes the cam plate **51** to drop down momentarily while the pin is moving to the upper end of the slot.

The ratchet pawl **77** provides a selective driving connection with the indicator assembly to advance the indicator hand **84** across the time scale. The indicator hand **84** is journaled on the indicator shaft **15**, and a ratchet cam plate **85** (Fig. 10) is adjustably secured on top of the indicator hand **84** by means of a screw **86** passing through a slot **87** in the ratchet cam **85** and screwed into the indicator hand **84**. The ratchet cam **85** is also journaled on the indicator shaft at the hole **88**. The ratchet cam **85** has teeth adapted to cooperate with the angular leg **77'** of the ratchet pawl **77** to advance the indicator hand across the 2-hour time scale **54** so as to register accumulated 12-minute intervals by depositing one to ten pennies, and to register accumulated 1-hour intervals by depositing one or two nickels, or to register a combination of 12-minute and 1-hour intervals by depositing one up to five pennies with one nickel.

The ratchet pawl is controlled by an arcuate cam slide **89** which is secured at its lower end to the rear coin plate **17** by a screw **90** and at its upper end by a screw **91**, and the slide contacts and guides the outer notched end of the leg **77'** of the pawl. For a five-penny, 1-hour meter, a 1-hour time scale **54'** as shown in Fig. 14 is mounted on the bracket **52**, and for convenience the 1-hour scale may be imprinted on the back side of the 2-hour scale **54** so that the scale is merely turned over when it is desired to change from a 2-hour to a 1-hour meter or vice versa. The ratchet cam plate **92** for the five-penny, 1-hour meter is adjustably mounted on top of the ratchet cam **85**, as best shown in Fig. 3, being pivoted thereon at **93** for swinging out over the ratchet cam **85** in position to engage the leg **77'** of pawl **77**, and being adjustably secured by a screw **94** working in a slot **95** in the ratchet cam **92** and screwed in cam **85** at **94'**. A cam slide **96** for guiding the ratchet pawl when the ratchet cam **92** is used is adjustably mounted on top of the cam slide **89**, being pivoted thereon at **97** for swinging out over the slide **89**, and being adjustably secured thereto by a screw **98** in a slot **99** in the slide **96** and screwed into slide **89**.

The indicator assembly includes a counterweight **100** which is secured on the indicator shaft **15** by the nuts **15'**. The frictional engagement previously mentioned, between the indicator assembly and the indicator shaft **15** is preferably obtained by means of a dished washer **101** which is clamped between the ratchet cam **85** and a shoulder on the shaft **15**.

When the 2-hour time scale **54** is used with the 2-hour ratchet cam **85** and the 2-hour cam slide **89** in the operating positions shown in Figs. 1 through 13, the operation of the novel meter is as follows: If the first coin deposited in the meter is a penny, the resetting mechanism will operate the flag cam **51** through the short stroke as previously described, and as the pawl **77** moves upwardly along the slide **89**, the notched end of the leg **77'** is pulled by the spring **79** into the notch **102** in the edge of the slide **89**. Referring to Fig. 10, the lower nine teeth **103** on the ratchet cam **85** are located on a slightly shorter radius from the indicator shaft than the upper five teeth **104**, and the notch **102** on slide **89** is not deep enough to allow the leg **77'** of the pawl to engage any of the teeth **103**, but is deep enough to allow the pawl to engage the upper five teeth **104**.

As the pawl **77** drops into the lower end of notch **102** on slide **89**, the leg **77'** engages the lowermost of the upper five teeth **104** and rotates the indicator hand **84** until the pawl passes the depressed portion **105** of the notch **102** and is kicked out by the upper end thereof. During this operation the flag cam **51** has raised the time scale to the position of Figs. 6 and 8, and the indicator hand **84** has been advanced by the pawl to register 12 minutes on the scale. When the pawl is kicked out by the upper end of the notch **105**, at the position shown in Fig. 11, the return stroke of the resetting mechanism returns the flag cam **51** and pawl **77** to starting position while the frictional engagement of the indicator allows it to remain at 12 minutes until it is returned to zero by the clockwork mechanism.

Referring to Fig. 8, when the flag cam is returned to starting position, the inwardly extending tongue **84'** struck out from the indicator hand slidably supports the time scale **54** in raised position until the hand has been returned beyond zero, at which time the scale drops down to rest temporarily on a tongue **84''** struck out from the overtime pointer **84*a***. After the overtime period has elapsed and the pointer **84*a*** has reached zero, the scale drops further to engage the lever L as in Fig. 5, which stops the clock mechanism.

If now a second penny is deposited, as the ratchet pawl is moved upwardly by the resetting mechanism, the pawl drops into the lower end of notch **102**, but due to the lesser radius of the nine lower teeth **103** on the ratchet cam, the pawl passes by the teeth **103** until it drops into the depressed notch **105** where it engages the topmost of the teeth **103** and advances the indicator hand **84** to register 24 minutes (Fig. 12), at which time the pawl is kicked out by the upper end of notch **105** and returned to starting position by the resetting mechanism.

Succeeding pennies deposited will cause the pawl to advance the indicator hand 12 minutes for each penny as the pawl drops into the notch **105** and engages successively lower teeth **103** on the ratchet pawl, so that if ten pennies are deposited successively the last penny will engage the bottom tooth **103** to register an accumulated time of 2 hours on the time scale. If additional pennies should then be deposited, the resetting mechanism will operate through the same cycle but the ratchet pawl **77** will not engage any teeth on the ratchet cam **85** due to the fact that the lowermost tooth **103** is positioned above the top of the notch **105**, and the pawl will be kicked out and returned each time without moving the indicator.

If the first coin deposited is a nickel, the flag cam **51** and pawl **77** are rotated through the full forward stroke, and as the pawl drops into the bottom of notch **102** it engages the lowermost of the five upper teeth **104** and advances the indicator to register 12 minutes by the time the pawl is kicked out by the upper end of notch **105**. The pawl continues to advance; however, through the full stroke and the high portion **106** of the slide guides the pawl past the rest of the upper teeth **104** until it engages the stop shoulder **107** of the ratchet cam **85** and moves the indicator to the 1-hour mark on the time scale as shown in Fig. 8. At this point, the return stroke of the resetting mechanism returns the pawl and flag cam to starting position while leaving the indicator at 1 hour to be returned by the clockwork mechanism in a 1-hour interval of time.

After the indicator hand is thus advanced to register 1 hour by the deposit of a nickel or by the deposit of five pennies, the deposit of a nickel will advance the ratchet pawl past some of the teeth **103** until it drops into the

depressed notch 105 where it engages the fifth tooth 103 counting down from the top, and advances the indicator through a 12-minute interval, at which point the pawl is kicked out by the upper end of the notch 105 and moves along the high part 106 of the slide until it drops into the second notch 108 where it engages the lowermost of the five upper teeth 104, as indicated in Fig. 13, and moves the indicator 84 to the 2-hour mark on the time scale.

If one or up to four pennies are deposited and then a nickel is deposited, the accumulated corresponding time intervals will be registered by the indicator hand. For example, if one penny has moved the indicator to register 12 minutes as previously described, and a nickel is then deposited, the pawl 77 will pass the lower eight teeth 103 and engage the top tooth 103 when it drops into the depressed notch 105, moving the indicator another 12 minutes before the pawl is kicked out by the upper end of the notch, and when the pawl is moved through the full stroke up to the second notch 108 it will engage the topmost tooth 104 and move the indicator to register 1 hour and 12 minutes.

If two pennies have been deposited to move the indicator to 24 minutes, as previously described, and a nickel is then deposited, the pawl will engage the next to the top tooth 103 when it drops into the depressed notch 105, moving the indicator forward 12 minutes until the pawl is kicked out by the upper end of notch 105, and then the pawl will move forward and drop into the notch 108 where it engages the next to the top tooth 104 and moves the indicator to register 1 hour and 24 minutes. If three pennies followed by a nickel are deposited, the pawl first engages the third from the top of the lower teeth 103, and then engages the third from the top of the teeth 104, and if four pennies followed by a nickel are deposited, the pawl first engages the fourth from the top of the lower teeth 103 and then the fourth from the top of the teeth 104, to move the indicator to register 1 hour and 36 minutes and 1 hour and 48 minutes, respectively.

If it is desired to change the meter to a five-penny, one-nickel meter registering up to 1 hour, the ratchet cam 92 and the ratchet slide 96 are adjusted radially outward to cover up the ratchet cam 85 and the ratchet slide 89, respectively. The ratchet cam 92 is adjusted by loosening the screw 94 and swinging the cam outwardly about its pivot 93 to the position shown in Fig. 14, and then tightening the screw 94. The ratchet slide 96 is adjusted by loosening the screw 98 and swinging the slide outwardly about its pivot 97 to the position shown in Fig. 14, and then tightening the screw 98. The time scale 54 is then turned over to expose the 1-hour time scale 54 on the other side, and the meter is ready for operation as a five-penny, one-nickel, 1-hour meter.

If now a nickel is deposited, the pawl 77 engages the tooth 109 (see Figs. 3 and 14) which now protrudes radially outward sufficiently to engage the pawl at all times, and the pawl rotates the indicator across the entire time scale to register 1 hour, as shown in Fig. 14.

If a penny is first deposited, the pawl engages the tooth 109, but only moves through the short stroke due to the shifting of the selector link 48 by the penny, so that the indicator is advanced to register 12 minutes on the 1-hour scale. If now a second penny is deposited, the pawl during the short stroke drops into the notch 110 on slide 96 where it engages the topmost of three notches 111 in the ratchet cam 92, moving the indicator forward to register an additional 12 minutes, as indicated in Fig. 15, before the pawl is kicked out by the top of notch 110 and returned by the resetting mechanism.

A third penny will cause the pawl to engage the next lower notch 111 to advance the indicator to 36 minutes, a fourth penny will cause the pawl to engage the bottom notch 111 to advance the indicator to register 48 minutes, and a fifth penny will cause the pawl to engage the bottom edge of ratchet cam 92 to advance the indicator to register 60 minutes.

Accordingly, the ratchet cams 85 and 92 and the ratchet slides 89 and 96 can be quickly adjusted in place to convert the meter from a 2-hour meter to a five-penny, 1-hour meter, or vice versa, without requiring replacement of any of the parts, and without requiring delicate adjustment by a skilled mechanic, thereby greatly decreasing the amount of expense and maintenance required, and providing a meter which is easily adapted to meet changing parking conditions and requirements.

It is understood that within the scope of the invention, other combinations of the two ratchet cams and ratchet slides can be utilized to obtain particular time periods for special meters. For example, the 1-hour slide 96 may be used with the ten-penny ratchet cam 85 to register 30 minutes for one nickel. In this connection, it is noted by referring to Fig. 4 that a row of additional pivot holes 112 is provided in the flag cam 51 for changing the location of the pawl 77 for special meters.

Referring to the rocker arm 72, best shown in Figs. 5 and 7, as previously described this rocker arm supports a penny coin when it drops between the nickel lever arm 55 and the lift lever arm 57, as shown in Fig. 9. The rocker arm 72 being firmly secured to the release cam plate 39, as previously described, it rotates with the release cam counterclockwise in the slot 62 in the rear coin plate 17 until the nickel lever 55, which follows the rocker arm, allows the penny to roll off onto rivets 63, whereupon the return stroke of the release cam causes the lever 55 to roll the penny off the rivets onto the arm 65 of the release cam.

If it is desired to change the meter from a penny, nickel meter to one operated by nickels alone, all that is necessary is to rotate the resetting mechanism to a position such as shown in Figs. 8 and 14, where the rocker arm 72 is accessible through the enlarged opening 113 in the coin guide plate 17, and then by loosening the screw 73, the rocker arm may be removed. Without the rocker arm 72 a penny deposited in the meter will drop rapidly between the nickel lever arm 55 and the lift lever arm 57 without contacting the trip lever 25 long enough to start the clockwork to drive the resetting mechanism, and the penny will bypass or drop to the right of the spacer 23. To convert the meter back to a penny, nickel meter, it is only necessary to replace the rocker arm.

This is a decided improvement over prior meter constructions of this type which embodied a spring-actuated rocker arm having a spring-retaining cap, because the removal or replacement of a rocker arm was a much more tedious and difficult operation. Furthermore, the present improved rocker arm is so positioned that it will support a dime coin as well as a penny and cause the dime to advance the indicator to register 1 hour in the same manner as a nickel coin. The dime coin does not function to shift the time selector link 48 as does a penny, because by the time the nickel lever 55 has moved to the right the additional distance required to pinch the smaller diameter dime coin, the pin 74 on the time selector link 48 has moved out of the way of the end of the lift lever. Thus the pinching action moves the lift lever but does not shift the time selector link 48, and a full stroke of the resetting mechanism is obtained.

The novel coin-retainer means, for yieldingly maintaining a penny in position to vary the stroke of the flag cam by shifting the time selector link 48 during the first part of the operating cycle of the resetting mechanism, will now be described. The purpose of this coin-retaining means is to prevent a penny from being jarred upwardly between the nickel lever arm 55 and the lift lever arm 57 at the time the pinching action on the penny occurs, as shown in Fig. 9. If the meter is jarred by bumping the meter housing at just the right instant immediately before this pinching action takes place, the penny will jump upwardly and allow the lever arm 55 to pass around without pinching it against the lift lever, so that the time selector link 48 will not be shifted and the resetting mechanism will operate the flag cam 51 through its full stroke, advancing the indicator hand to register an hour instead of the correct 12-minute time interval.

Referring to Figs. 16 and 17, the front coin cap plate 18 has a spring wire 115 secured at its upper end to the plate by a screw 116 which also holds the cover 117 in position to protect the wire. The lower end of the wire preferably has an inwardly bent V-shaped portion 118 which extends through a slot 119 in the plate 18 and yieldingly engages the top edge of a penny P resting on the rocker arm 72. The yielding engagement of this wire spring 115 with the penny is sufficient to prevent it from jumping upwardly when the meter is jarred and thus escaping the pinching of the lever arm 55 to shift the time selector link. However, the portion 118 of the wire en-

gages the penny to the right of center, as shown, and thus when the lever **55** moves counterclockwise under the penny and the pressure of the spring **60** on the lift lever arm urges or releases the penny slightly upwardly, the engagement of the wire spring **115** will permit a slight upward springing of the penny and allow it to roll downwardly onto the rivets **63**, in the manner previously described.

Referring to Figs. 14 and 11, when the meter is adjusted for 1-hour operation (Fig. 14) the indicator hand or pointer **84** moves through twice the arc, in traversing the 1-hour scale, than the arc through which it moves in traversing a 1-hour segment on the 2-hour scale in Fig. 11. That is to say, the pointer **84** must move through twice the distance in 1 hour, when the meter is set for 1-hour operation, that it moves in 1 hour when the meter is set for 2-hour operation. The timing movement of the indicating hand **84** is controlled by operation of the indicator shaft **15** which is driven by the clockwork mechanism in the case **14**. Accordingly, one particular clock mechanism is used for 1-hour operation of the meter and a different clock mechanism is used for 2-hour operation of the meter; or a gear or other change in the clockwork is made so that indicating hand **84** is rotated through twice the arc, or half the arc, as the case may be, in a given period of time, in converting the meter from 1- to 2-hour operation or vice versa.

Accordingly, the novel adjustable ratchet cams and ratchet slides, together with the novel rocker arm and coin-retainer spring constitute improved time selecting and coin handling mechanism for handling coins of different denominations and for changing the meter quickly to operate over a different number of time intervals and for different accumulated time periods.

In the foregoing description, certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such words are used for descriptive purposes herein and are intended to be broadly construed.

Moreover, the embodiment of the improved construction illustrated and described herein is by way of example, and the scope of the present invention is not limited to the exact details of construction.

Having now described the invention, the construction, the operation and use of a preferred embodiment thereof, and the advantageous new and useful results obtained thereby; the new and useful constructions, and reasonable mechanical equivalents thereof obvious to those skilled in the art, are set forth in the appended claims.

We claim:

1. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances a time indicator different amounts for coins of different denominations to accumulate a total time period proportionate to the total value of the inserted coins regardless of their order of insertion, a toothed ratchet plate rotatable on the flag cam plate axis engageable by said pawl, said time indicator fixed on said ratchet plate, an arcuate cam slide on said meter and slidably contacting said pawl for controlling the point of engagement of the pawl with and disengaging it from said toothed ratchet plate, a second toothed ratchet plate adjustably mounted on said first ratchet plate for movement bodily from inoperative position into operative position for engagement by said pawl, and a second arcuate cam slide adjustably mounted on said first cam slide for movement to an operative position covering said first cam slide for slidably contacting said pawl to selectively engage the pawl with and disengage it from said second ratchet plate.

2. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances a time indicator different amounts for coins of different denominations to accumulate a total time period proportionate to the total value of the inserted coins regardless of their order of insertion, a toothed ratchet plate rotatable on the flag cam plate axis and engageable by said pawl, said time indicator fixed on said ratchet plate, an arcuate cam slide on said meter and slidably contacting said pawl for controlling the point of engagement of the pawl with and disengaging it from said toothed ratchet plate, and a second arcuate cam slide adjustably mounted on said first cam slide for movement to an operative position covering said first cam slide for slidably contacting said pawl to selectively engage the pawl with said ratchet plate.

3. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances a time indicator and a coin guide plate mounted in front of said mechanism, a pair of toothed ratchet plates carrying said indicator rotatable on the flag cam plate axis and adjustable relative to each other for selective engagement by said pawl to advance the time indicator, and a pair of arcuate notched cam slides mounted on said coin guide plate for adjustment relative to each other to move one slide or the other into operative position to slidably guide said pawl to engage it with the teeth on one of said ratchet plates.

4. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances a time indicator and a coin guide plate mounted in front of said mechanism, a pair of toothed ratchet plates carrying said indicator rotatable on the flag cam plate axis and adjustable relative to each other to move one plate or the other into operative position for engagement by said pawl to advance the time indicator, and an arcuate notched cam slide mounted on said coin guide plate to slidably guide said pawl to engage it with the teeth on one of said ratchet plates.

5. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances a time indicator and a coin guide plate mounted in front of said mechanism, a toothed ratchet plate carrying said indicator rotatable on the flag cam plate axis, a time indicator on said ratchet plate, and a pair of arcuate notched cam slides mounted on said coin guide plate for adjustment relative to each other to move one slide or the other into operative position to slidably guide said pawl to engage it with the teeth on said ratchet plate.

6. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances a time indicator different amounts for nickels and pennies to accumulate a total time period proportionate to the total value of the inserted nickels and pennies regardless of their order of insertion, said mechanism including an oscillatable release cam having a pin engaged in an L-shaped slot in a link pivoted to the flag cam plate for oscillating said plate, and means to shift the link to vary its stroke, a rocker arm fixed on said release cam for supporting a penny in link-shifting position during the the initial movement of said mechanism, a pair of ratchet plates rotatable on the flag cam plate axis and adjustable relative to each other selectively to be engaged by said ratchet pawl, a time indicator associated with said ratchet plates, and a pair of cam slides relatively adjustably mounted on the meter for selectively slidably contacting said pawl to engage it with one of said ratchet plates when the mechanism oscillates said flag cam plate.

7. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances the time indicator different amounts for nickels and pennies to accumulate a total time period proportionate to the total value of the inserted nickels and pennies regardless of their order of insertion, said mechanism including an oscillatable release cam and means for cooperating with a penny to vary the stroke imparted to the flag cam plate by said release cam, a rocker arm fixed on said release cam for supporting a penny in stroke-varying position during the initial movement of said mechanism, a pair of ratchet plates rotatable on the flag cam plate axis and adjustable relative to each other selectively to be engaged by said ratchet pawl, a time indicator associated with said ratchet plates, and a pair of cam slides relatively adjustably mounted on the meter for selectively slidably contacting said pawl to engage it with one of said ratchet plates when the mechanism oscillates said flag cam plate.

8. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances the time indicator different amounts for nickels and pennies to accumulate a total time period proportionate to the total value of the inserted nickels and pennies regardless of their order of insertion, said mechanism including an oscillatable release cam and means for cooperating with a penny to vary the stroke imparted to the flag cam plate by said release cam, a rocker arm fixed on said release cam for supporting a penny in stroke-varying position during the initial move-

ment of said mechanism, a pair of ratchet plates rotatable on the flag cam plate axis and adjustable relative to each other selectively to be engaged by said ratchet pawl, a time indicator movable with said ratchet plates, and a fixed cam slide for slidably contacting said pawl to engage it with one of said ratchet plates when the mechanism oscillates said flag cam plate.

9. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances the time indicator different amounts for nickels and pennies to accumulate a total time period proportionate to the total value of the inserted nickels and pennies regardless of their order of insertion, said mechanism including an oscillatable release cam and means for cooperating with a penny to vary the stroke imparted to the flag cam plate by said release cam, a rocker arm fixed on said release cam for supporting a penny in stroke-varying position during the initial movement of said mechanism, a ratchet plate rotatable on the flag cam plate axis and carrying a time indicator, and a pair of cam slides relatively adjustably mounted on the meter for selectively slidably contacting said ratchet pawl to engage it with said ratchet plate when the mechanism oscillates the flag cam plate to advance the time indicator according to the stroke of the flag cam plate.

10. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances the time indicator, said mechanism including an oscillatable release cam having a pin engaged in an L-shaped slot in a link pivoted to the flag cam plate for oscillating said plate, means operated by a penny to shift the link laterally of said slot to vary the stroke of the link and the amount the indicator is advanced, and a rocker arm on and movable with said release cam for supporting a penny in link-shifting position.

11. In a parking meter having coin controlled mechanism for oscillating a flag cam plate carrying a ratchet pawl which advances the time indicator, said mechanism including an oscillatable release cam and means for cooperating with a pennyl to vary the stroke imparted to the flag cam plate by said release cam, a rocker arm fixed on said release cam for supporting a penny in stroke-varying position, and a spring wire yieldingly engaging said penny to hold it in stroke-varying position during the initial movement of said mechanism.

12. In a parking meter having coin controlled mechanism for advancing a time indicator through certain intervals, said mechanism including stroke-varying means for cooperating with a penny to advance the time indicator a lesser interval, a coin guide plate for guiding a coin into mechanism-operating position, and a spring wire mounted on said coin guide plate for yieldingly holding a penny in stroke-varying position during the initial movement of said mechanism.

13. In a parking meter having coin controlled mechanism for oscillating a flag cam plate to advance a time indicator, said mechanism including means for cooperating with a penny to vary the stroke imparted to the flag cam plate, a coin guide plate for guiding a coin into position to operate said mechanism, and a spring wire mounted on said coin guide plate for yieldingly holding a penny in stroke-varying position during the initial movement of said mechanism and for permitting said penny to be released during subsequent movement of said mechanism.

14. In a coin-controlled time-measuring parking meter adapted to be actuated by coins of different sizes regardless of the order of insertion of such coins to accumulate a total time period proportionate to the total value of the inserted coins, a time-indicating mechanism including means for driving the same in one direction, a resetting mechanism including means for resetting said time-indicating mechanism in the opposite direction, pawl and ratchet means responsive to inserted coins of different sizes for causing a part of the resetting mechanism to move a predetermined cumulative distance dependent upon the sizes of the coins inserted and irrespective of the order in which different sized coins are inserted, and means for changing the predetermined distance that said resetting mechanism part moves to provide for a different total time period of meter operation.

15. In a coin-controlled time-measuring parking meter adapted to be actuated by coins of different sizes regardless of the order of insertion of such coins to accumulate a total time period proportionate to the total value of the inserted coins, a time-indicating mechanism including an indicating member and means for driving the same in one direction, a resetting mechanism including means for resetting said time-indicating member in the opposite direction, pawl and ratchet means responsive to inserted coins of different sizes for causing said member upon resetting to move a predetermined cumulative distance dependent upon the sizes of the coins inserted and irrespective of the order in which different sized coins are inserted, and means for changing the predetermined distance that said member moves to provide for a different total time period of meter operation.

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