Dec. 31, 1940. P. R. FINCH ET AL 2,227,182

PARKING METER

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Fig. 1

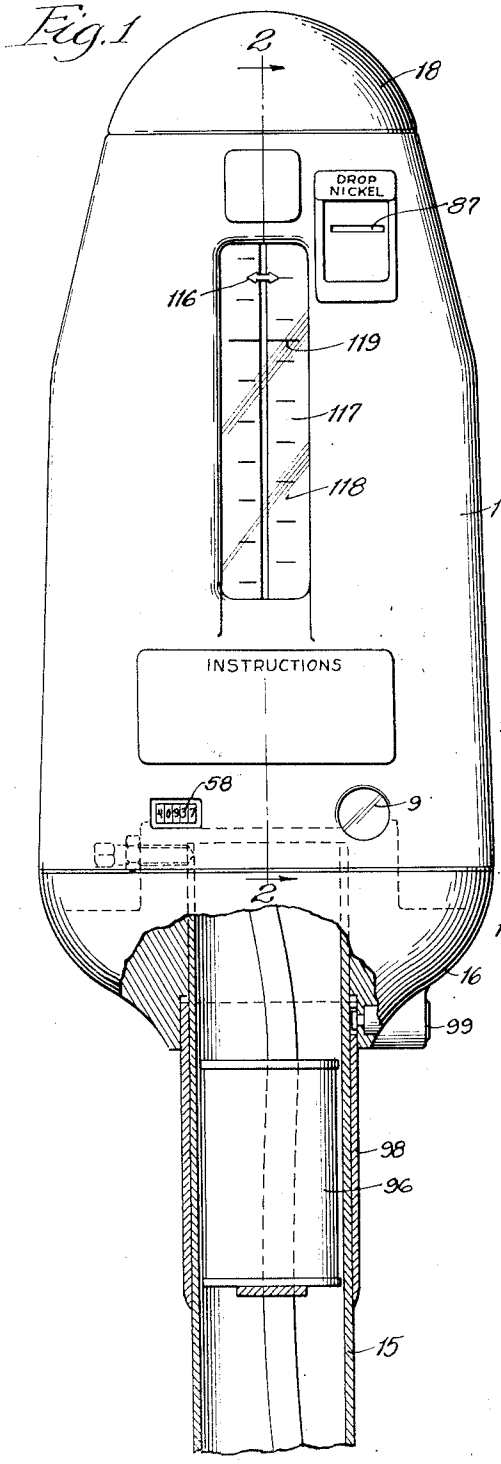
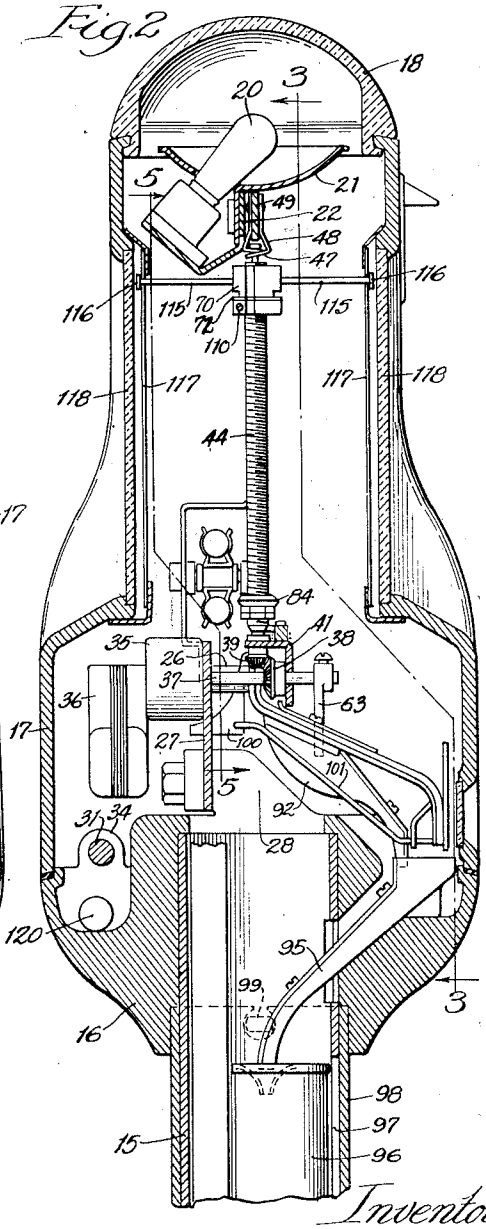


Fig. 2



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Fig. 3

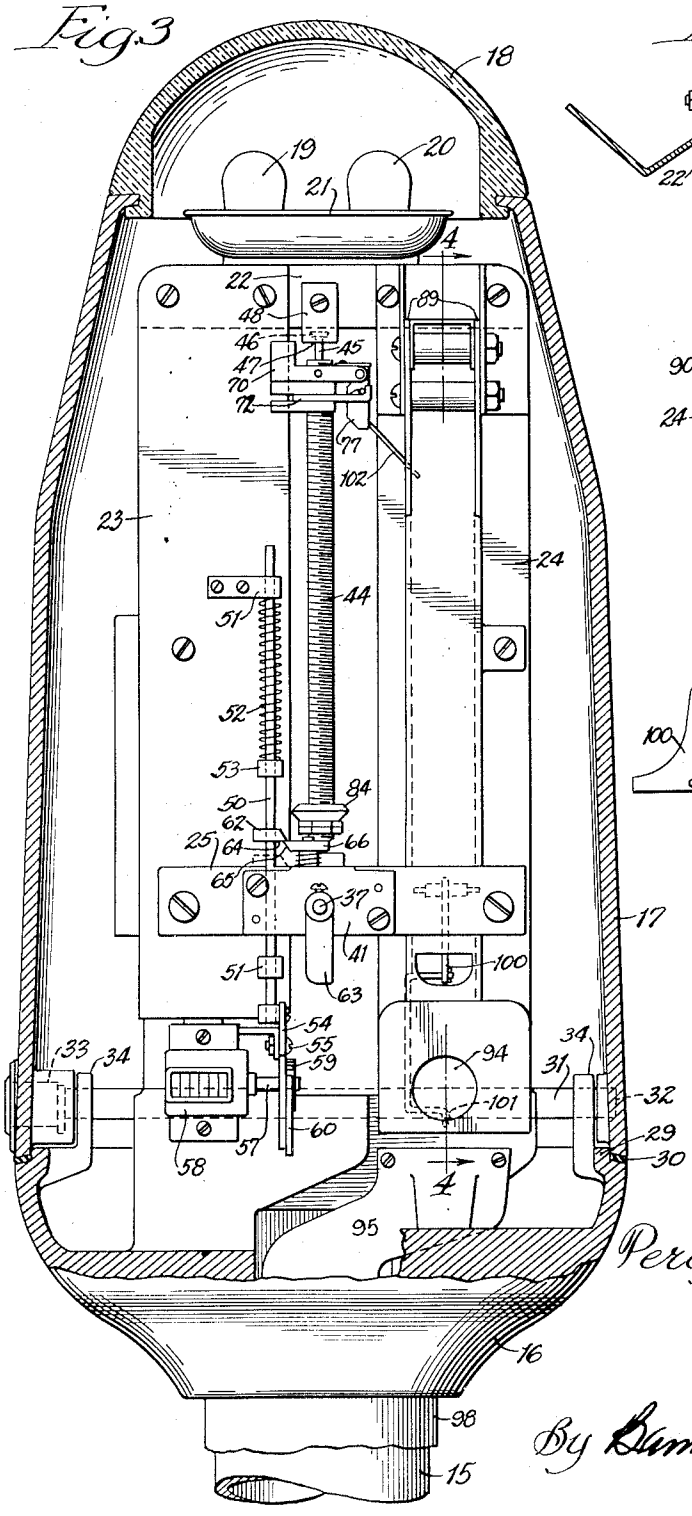
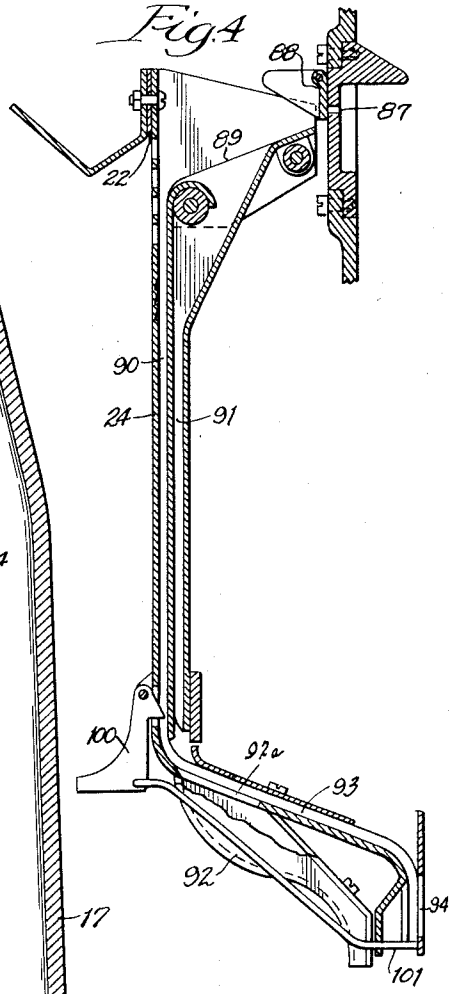


Fig. 4



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PARKING METER

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Fig. 5

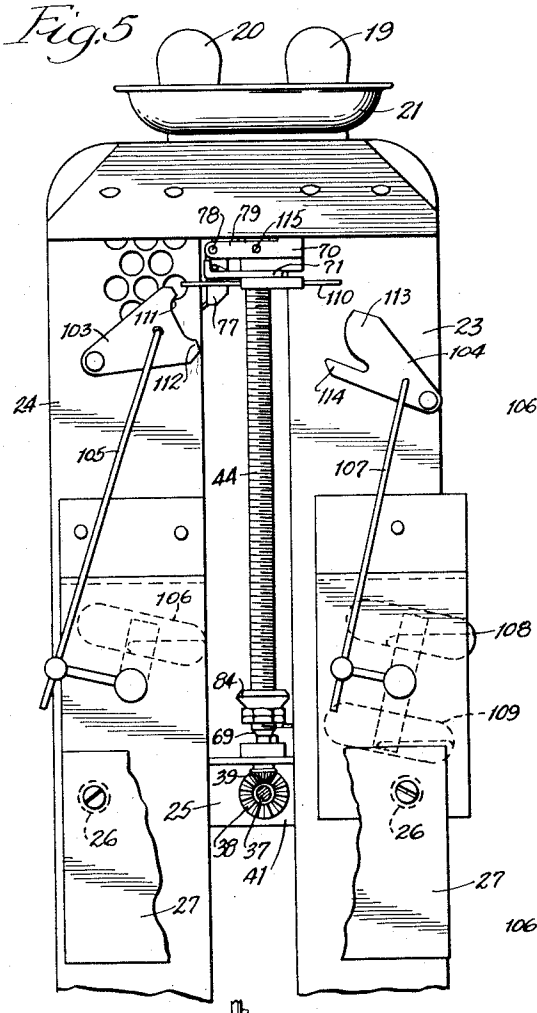


Fig. 6

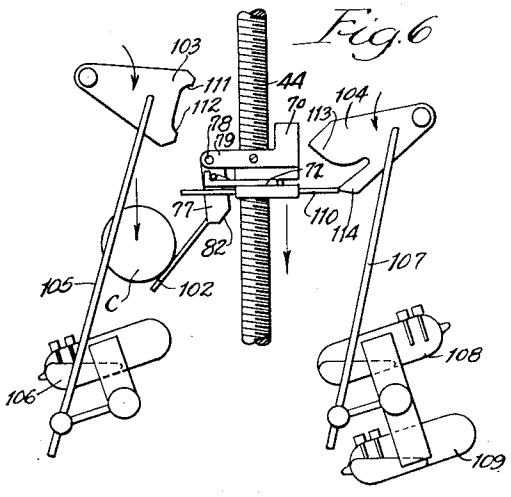


Fig. 7

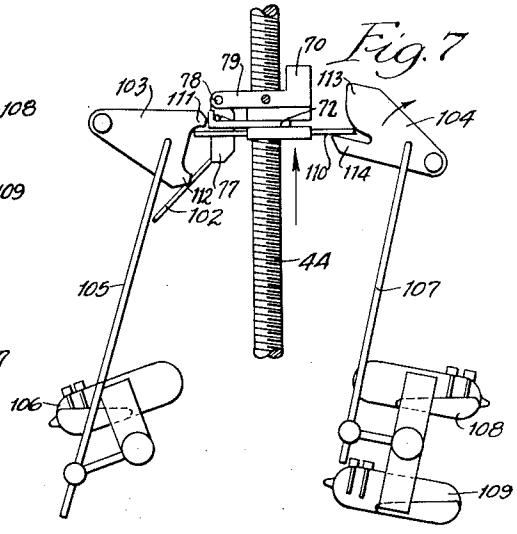
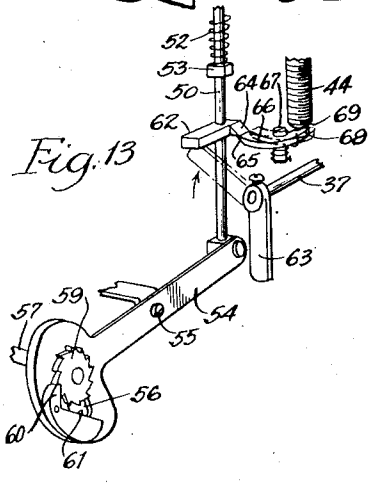


Fig. 13



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PARKING METER

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Fig. 8

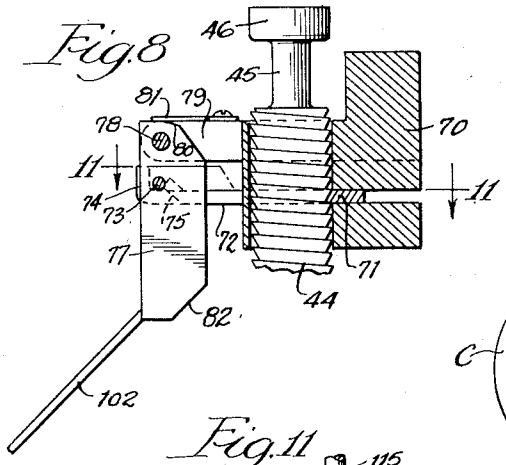


Fig. 9

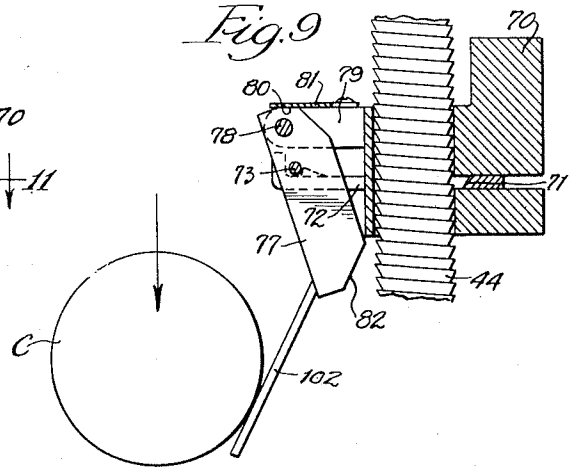


Fig. 11

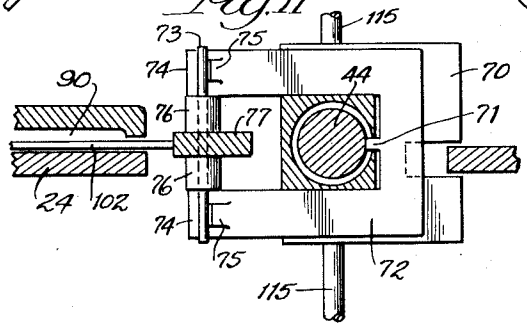


Fig. 10

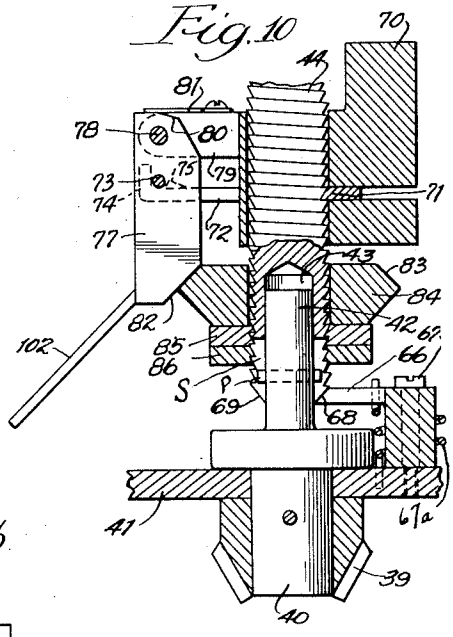
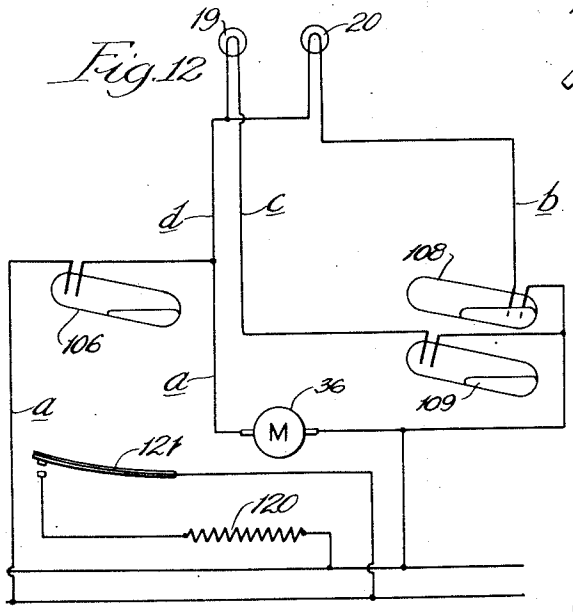


Fig. 12



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UNITED STATES PATENT OFFICE

2,227,182

PARKING METER

Percy R. Finch and Otto J. Herb, Chicago, Ill., assignors, by mesne assignments, to Beacon Meters, Inc., Chicago, Ill., a corporation of Illinois

Application April 26, 1937, Serial No. 138,956

10 Claims. (Cl. 194—1)

Our present invention relates to a power-operated parking meter which incorporates in its mechanism various improvements having to do with the display of visual signals, heating of the mechanism for protection against the effects of weather and low temperature in the cold season, and with the mounting of the meter upon a hollow stand in which is contained a coin box, access to which is effectively barred except in response to operation of a cylinder lock which thereupon permits removal of a protecting sleeve. Our invention comprises also various other features of construction all contributing to durability and dependability in operation, compactness and accessibility of the operating parts, and economy in the production and assembly of the operating mechanism which is of simple character.

These and various other objects, as will more hereinafter appear, may be realized from a construction embodying the present improvements of which a suggestive embodiment is illustrated in the accompanying drawings in the manner following:

Figure 1 is a front elevation of a parking meter, the supporting stand as well as the lower portion of the casing for the meter being shown in section to exhibit the coin box which is interiorly thereof;

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1;

Fig. 3 is a vertical section taken on the offset line 3—3 of Fig. 2;

Fig. 4 is a view in vertical section of certain of the operating parts taken on the line 4—4 of Fig. 3;

Fig. 5 is a similar view taken on the offset line 5—5 of Fig. 2;

Figs. 6 and 7 are views in elevation of the carriage and its operating shaft, as well as certain parts which co-operate therewith, two positions thereof being indicated;

Fig. 8 is a vertical section through the carriage and associated pawl in the position which it occupies at the upper limit of its travel on the operating shaft;

Fig. 9 which is a similar view shows the carriage pawl released by a coin in its passage through the chute, the carriage being thereby freed for descent upon the shaft;

Fig. 10 which is a similar view shows the carriage at the conclusion of its descent upon the shaft whose lower pivotal mounting is also illustrated in detail;

Fig. 11 is a horizontal section through the carriage taken on line 11—11 of Fig. 8;

Fig. 12 is a diagrammatic view showing the electrical connections for the operating mechanisms; and

Fig. 13 is a perspective view of the operating connections from the carriage shaft to the counter device.

Referring particularly to Figs. 1 and 2, we have shown a stand in the form of a tubular supporting column 15 whose upper end is entered into the base 16 whereon is supported the meter casing 17 surmounted by a globular head 18. The head which may be of glass or other translucent material is illuminable from within by one of two electric bulbs 19 and 20 having an assisting reflector 21, all supported upon a cross-piece 22 affixed to the upper end of a frame comprising two spaced plates 23 and 24 in side by side relation which extend downwardly toward the base where they are joined by a second cross-piece 25. The frame is carried upon studs 26 extended laterally from a head plate 27 which is supported upon a bracket 28 rising from the base.

The casing, as already indicated, is fitted upon the base which is formed with an upwardly extending shoulder 29 providing a seat whereon the lower end of the casing may rest. A gasket 30 may be employed to provide a seal whereby to prevent the effects of weather from reaching the interior of the casing. Any suitable form of lock may be used, the one suggested in Fig. 3 comprising a bolt 31 having one end 32 receivable within a socket formed on the inner face of the casing wall, the bolt extending diametrically toward the opposite casing wall where it joins a cylinder lock 33 operable by a key (not shown) from a point exterior of the casing; the bolt also traverses a pair of brackets 34 which are extended upwardly from the base so as to secure the casing body to the base when the bolt end is fitted into the socket as shown in Fig. 3. To remove the casing, the key is first applied to rotate the cylinder which may thereupon be shifted longitudinally, together with the bolt, thereby unlocking the casing body from the base. When the casing is removed, the operating mechanism which is carried upon the frame already described remains supported from the base so as to be accessible for whatever attention may be desired.

The head plate 27 also supports a speed reduction box 35 to which is joined a motor 36. The driving connections from the motor through the speed reduction box include a horizontal driving shaft 37 fitted with a beveled gear 38 in mesh

with a second gear 39 which is carried on the lower end of a stud shaft 40 having a rotatable mounting in a bracket 41 (see Fig. 10). Extending axially beyond the upper end of this shaft is a spindle 42 which is slidingly fitted into an axial socket 43 formed in the lower end of a vertical operating shaft 44 which is provided exteriorly with ratchet screw threads. As by means of the pin P and slot connection S, the spindle is adapted to transmit motion to the shaft. The upper end of this shaft terminates in a spindle 45 provided with a head 46 which is resiliently supported by the overlapped slotted ends 47 of two spring arms 48 (see Fig. 2) which depend from a support 49 on the upper cross-piece 22.

To one side of the shaft, and parallel therewith, (see Figs. 3 and 13) is a rod 50 having a vertically slidable mounting within bearings 51 upon the frame and connected at its lower end to one end of the lever 54 which is fulcrumed at 59. A compressible spring 52 which surrounds this rod exerts a downward thrust force against a collar 53 thereon whereby the rod tends to depress one end of the lever 54. The opposite lever end is formed into a flat head having an arcuate slot 56 through which is extended the shaft 57 of a registering counter 58 (see Fig. 3). Fitted upon the counter-shaft is a ratchet wheel 59 adapted to receive engagement from a gravity pawl 60 pivotally carried on the lever head, there being a lug 61 extended from the pawl to engage with the ratchet wheel whereby its advance is limited to a distance of one tooth with each rocking movement of the lever, in a manner which will shortly be explained.

Extended fixedly from the rod 50 is a lateral arm 62 adapted to receive engagement from a crank arm 63 which is mounted on the driving shaft 37. With each revolution of this shaft the crank arm approaches the lateral arm from the underside, engaging therewith to raise the rod 50 unless it be supported against the tension of the spring 52 by means now to be described. Formed upon one side of the lateral arm, about opposite the rod, is a beveled lug 64 with which co-acts one beveled end 65 of a lever 66 mounted upon a vertical pivot 67, there being a coil spring 67a which rocks this lever to a position where it underlies the beveled lug 64 to sustain the rod 50 against the spring 52. The opposite lever end 68 which is also beveled is adapted to engage under one side of the beveled lower end 69 of the shaft 44. When this shaft, in response to impact, is downwardly shifted, the lever 66 is swung laterally about its vertical pivotal mounting 67 whereupon its oppositie end 65 moves to one side of the beveled lug 64, permitting the rod 50 to descend, the lever 54 to rock, and the counter to be actuated to register the movement just described.

Mounted to slide along the shaft 44 is a carriage 70 with an associated ratchet pawl 71 which is slidable toward and from the shaft whereby to engage horizontally with the ratchet threads thereof. As shown best in Figs. 8 to 11, the pawl is formed as an inward extension from the connecting leg of a U-shaped plate 72, the free ends of which are connected by a pin 73 which is fitted in place between spaced abutments 74 and 75. This pin also traverses spacing collars 76 on opposite sides of a lever 77 which depends from a pivotal mounting 78 upon an arm 79 which is laterally extended from the carriage. A face 80 proceeding at an angle slightly off the horizontal is formed at the upper end of the lever adapted to receive engagement from a spring 81, the effect being to maintain the lever in an inward position (see Fig. 9) once it is moved thereto. In reaching this position the lever forces the pawl away from the shaft to free the carriage for a gravity descent thereupon, the lever being maintained inwardly during this movement. Upon reaching a point close to the lower end of the shaft a cam face 82 on the lever will be engaged by a beveled face 83 on a collar 84 which is adjustably supported upon the shaft as by means of lock nuts 85 and 86. The effect of engagement from this beveled face of the collar will be to advance the pawl once more into engagement with the threads of the shaft.

Formed in the casing wall near its upper end is a coin receiving slot 87 (see Fig. 4) opposite whose inner end lies a gravity gate 88 which swings open to admit each coin as inserted. Opposite this slot is a chute carried upon one of the frame plates, comprising a pair of runways 89, spaced for co-operation with a coin of proper diameter, leading to a chute 90 adjacent a second chute 91, the entrance to which is between the two runways so that coins of less than the required diameter will drop thereinto and thence into a by-pass 92 now to be explained. Both chutes open at their lower ends into a common lateral chute 93, as shown in Fig. 4, which leads proper coins past a window 94 for later discharge into a further chute 95 with which the by-pass also connects. An improper coin descends through the chute 91 as above stated, and is directed into an opening 92a in the lower wall of the lateral chute 93, which opening 92a is too small for a proper coin to enter from the chute 90. This lateral chute 93 as well as the by-pass 92 conducts the coins to a box 96 which is mounted below the base on the supporting stand opposite an opening 97 in its wall through which the box may be laterally moved. A protecting sleeve 98 of hardened steel is slidingly fitted around the stand in position to close its opening, being releasably secured in place by a cylinder lock 99 which is fitted into the base. By use of a proper key this lock may be operated to release the sleeve for downward sliding movement whereby the coin box is accessible for removal or replacement.

A coin C of proper denomination, when inserted in the slot 87, will in its descent trip a weighted lever 100 which is connected to a sliding gate 101 just below the window where its progress is arrested, the coin being held at the window until the next succeeding coin in passing this lever opens the gate momentarily to permit release of the coin first mentioned. Almost at the commencement of its descent each coin will trip a finger 102 extending from the lever 77 into an open slot extending lengthwise of the chute 90, the pawl 71 being thereby released to cause the carriage to drop down against the stop collar 84. At the moment the pawl is released the position of several co-operating elements is as indicated in Fig. 5, which elements thereafter quickly assumes the position shown in Fig. 6, where the carriage is shown as having dropped far enough to swing the elements, including the mercury switches 106, 108 and 109 to positions where the lamp 20 will be extinguished and the lamp 19 lighted by completion of the motor circuit, see Fig. 12. These several cooperating elements comprise a pivoted lever 103 mounted on one frame plate near the upper end of the operating shaft, a second pivoted lever 104 mounted

upon the other frame plate but slightly lower than the first lever, a link 105 connecting the first lever with a rockably mounted mercury switch 106 controlling the motor 36, and a second link 107 connecting the second lever with a pair of mercury switches 108 and 109 rockably mounted as a unit to control the two lights 19 and 20. The facing ends of these two levers are formed for engagement by opposite ends of a bar 110 which extends transversely from the carriage in its lower region. Spaced shoulders 111 and 112 on the lever 103 and spaced shoulders 113 and 114 on the second lever 104 are provided, as shown, with the result that as the carriage descends the lever 103 is moved to rock the switch 106, which is interposed in the circuit *a* (see Fig. 12), thereby energizing the motor to cause operation thereof. During this same descent of the carriage the second lever 104 is also moved to rock the two switches 108 and 109, the former of which is interposed in the circuit *b* leading to the lamp 20 (of red color, if desired), and the latter in circuit *c* leading to the lamp 19 (of green color, if desired), one switch being opened and the other closed in this concurrent operation. The operating shaft being in rotation, the carriage now commences a slow ascent thereupon, with one of the lights—the green one, let us say—in continuous illumination. It is to be noted that the vertical position of the stop collar 84 is adjustable, so that the point at which ascent of the carriage is started, as well as the time required to complete such ascent, may be accurately regulated.

When the carriage has ascended to the point that its bar first engages the lever 104, there will be a reverse rocking of the switches 108 and 109 with the result that one of the lights (the green one, for example) is extinguished while the other light (the red one in this case) becomes illuminated. The carriage continues to ascend, however, until the lever 103 is engaged whereupon its operation is stopped. The switch 106 controlling the motor is also interposed in a connection *d* which completes the electrical circuit to both lights 19 and 20 so as to produce a shut-off thereof when the motor operation ceases.

By reference to Figs. 1 and 2 it will be noted that the carriage supports an oppositely extending wire 115 upon each of whose ends is fitted a pointer 116 which lies adjacent a dial plate 117 which is positioned behind a glass window 118 in the casing wall. The vertical positions of the pointers which are always the same are visible from opposite sides of the casing and when read in conjunction with the associated dials will afford an accurate indication of the time conditions. For example, if the mechanism be set for a time interval of sixty minutes to elapse during ascent of the carriage from its lowermost position to a level where the pointers are opposite an index line 119, there will be no difficulty in estimating the under-time or over-time with respect to this level, particularly if the dial be graduated according to units of minutes as would probably be desirable. The lever 104 controlling the light switches may also be so positioned as to operate when the pointers reach the index line, whereby there is green illumination during the time interval before this level is reached and red illumination thereafter until the carriage has traveled to its uppermost limit.

Within the base is a recess accommodating a small electrical heating unit of conventional character 120 in proximity to the motor which heating unit is connected in series circuit with a thermostatic switch 121, also shown in Fig. 12. In conditions of low temperature this switch acts automatically to place the heater in operation thereby preventing congealing of oil which is required for lubrication of the operating parts within the casing, and also preventing formation or retention on the casing exterior of ice or snow which might interfere with visibility of the dial indicators and the colored illumination through the globe at the top.

Briefly summarizing, insertion of a proper coin will set in motion the mechanisms described, causing, first, the carriage to drop to its starting point, the motor to commence operating, and one of the two lights in the duplex signal system to become illuminated; second, the carriage to ascend slowly through a first stage until the level of the index line is reached whereupon the illuminated light goes off and the other comes on; and third, continued ascension of the carriage through a second stage to its upper limit at which point the motor operation ceases and the remaining illuminated light is extinguished. This cycle of operations is repeated with insertion of each coin in sequence, regardless of the vertical position of the carriage, since the finger 102 remains projected into the coin chute at all times ready to be tripped by any passing coin. One who proposes to occupy the parking space at which the present meter is placed may therefore choose between accepting any indicated unused period of time already paid for, or buying a new full period of time through insertion of his own coin. An officer in attendance may tell from a distance and at a glance whether a car is parked overtime by observing the globular head of the casing. A green light may indicate time which is paid for; a red light, overtime; and no light, time not paid for.

It is to be noted that with each gravity descent of the carriage the shaft 44 is jolted downwardly in respect to the force of its impact delivered against the stop collar; when this happens the lever 66 is rotated to release the rod 50 which thereupon moves down, under the influence of the spring 52, to rock the lever 54 and actuate the counter mechanism. Inasmuch as the motor is also started during this same operation, the arm 63 will soon lift the rod, thereby resetting the mechanism for another actuation of the counter when the carriage again drops in response to insertion of a proper coin. By some such means as just described a count is automatically registered of each coin deposited in the receiving slot.

It is contemplated that electrical connections will be extended from the energized devices down through the stand to a source of current. By using a synchronous motor which is driven with alternating current, operation of the time mechanism to accord with movements of a clock may be assured, thereby obviating any uncertainty as to its timekeeping qualities.

We claim:

1. In a parking meter, a movable indicator, a scale associated with said indicator, a motor, means operated by the motor, releasable means movable with said indicator and adapted to connect said indicator to said motor operated means, said indicator being normally held at a predetermined point relative to said scale by said indicator operating means, coin controlled means

associated with said releasable means and adapted when operated by a coin to release said indicator for movement in one direction independently of the motor actuated means, and means adapted to operate said releasable means to reconnect said indicator with said motor actuated means, after a predetermined extent of movement of said indicator in said one direction, whereby said indicator will be moved in an opposite direction, said releasable means being operable to release said indicator from said motor operating means, at any time during said movement in said opposite direction, by a second coin inserted in said meter.

2. In a parking meter, a movable indicator, a scale associated with said indicator, a pair of signals associated with said meter, separate means for operating each of said signals disposed in the path of travel of said indicator, for operation thereby, a motor, means operated by the motor, releasable means movable with said indicator and adapted to connect said indicator to said motor operated means, said indicator being normally held at a predetermined point relative to said scale by said indicator operating means, coin controlled means associated with said releasable means and adapted when operated by a coin to release said indicator for movement in one direction independently of the motor actuated means, and means adapted to operate said releasable means to re-connect said indicator with said motor actuated means, after a predetermined extent of movement of said indicator in said one direction, whereby said indicator will be moved in an opposite direction, said releasable means being operable to release said indicator from said motor operating means, at any time during said movement in said opposite direction, by a second coin inserted in said meter.

3. In a parking meter, a movable indicator, a scale associated with said indicator, a pair of signals associated with said meter, separate means for operating each of said signals disposed in the path of travel of said indicator, for operation thereby, said scale being divided into two zones, one zone corresponding to a proper parking period and the other to an overparked period, said indicator being positioned at the end of the overparked zone when in normal position, one of said signal operating means being so arranged relative to the path of the indicator that it is operated thereby as said indicator moves from the overparking zone into the parking zone, and the other signal operating means being so arranged relative to the path of movement of the indicator that it is operated thereby as said indicator moves from said parking zone to said overparking zone, a motor, means operated by the motor, releasable means movable with said indicator and adapted to connect said indicator to said motor operated means, said indicator being normally held at a predetermined point relative to said scale by said indicator operating means, coin controlled means associated with said releasable means and adapted when operated by a coin to release said indicator for movement in one direction independently of the motor actuated means, and means adapted to operate said releasable means to re-connect said indicator with said motor actuated means, after a predetermined extent of movement of said indicator in said one direction, whereby said indicator will be moved in an opposite direction, said releasable means being operable to release said indicator from said motor operating means, at any time during said movement in said opposite direction, by a second coin inserted in said meter.

4. In a parking meter, the combination of a reciprocable carriage operable in one direction by gravity, an electric motor, a drive shaft driven by said motor, a clutch operatively associated with said drive shaft and carriage for releasably connecting the carriage to said shaft for movement of said carriage in an opposite direction, coin controlled means operatively associated with said clutch for disengaging said clutch to release said carriage from said shaft whereby to permit said gravity operation of said carriage, an electric circuit for said motor, a normally open switch interposed in said circuit to said motor, means for operating said switch, said last mentioned means being mounted for operation by said carriage to close said switch during gravity operation of the carriage and to open said switch on the reverse movement of said carriage by said motor, and means for reengaging said clutch to connect said carriage to said drive shaft when said carriage has completed its gravity descent.

5. In a parking meter, power-operated time mechanism comprising a vertical rotatable shaft having ratchet screw threads lengthwise thereof, and a ratchet pawl-driven carriage mounted to slide upon the shaft, the pawl being engageable horizontally with the threads to cause ascension of the carriage when the shaft is rotated, and coin operated means associated with said pawl for releasing same from said threads for gravity descent of said carriage upon said shaft.

6. In a parking meter, the combination of a vertical rotatable shaft having ratchet screw threads extending lengthwise thereof, a carriage slidable upon the shaft, a pawl associated with the carriage adapted to move into engaging relation with the shaft threads whereby to cause ascension of the carriage upon the shaft, coin mechanism associated with said pawl and actuated solely by a coin for operating the same whereby to move the pawl out of engagement with the shaft threads and release the carriage for descent upon the shaft, and a stop adjustable lengthwise of the shaft against which the carriage abuts at the conclusion of its descent.

7. In a parking meter the combination of a power mechanism including a vertical screw shaft, a carriage mounted upon said shaft for sliding by gravity in one direction, clutch mechanism on said carriage operable to normally connect said carriage to said screw shaft for moving said carriage upward along the shaft, clutch releasing means associated with the carriage and having coin actuated means for releasing the clutch from said screw shaft for gravity descent upon the shaft, and means actuated by gravity movement of the carriage on the shaft for re-establishing a driving connection with the screw shaft whereby to return the carriage upwardly along the shaft by said power mechanism.

8. In a parking meter a pair of electric lamps, an electric motor, a source of current, a circuit from said source through said motor, separate circuits from said source through each of said lamps and paralleling the circuit through said motor, a normally open switch common to said motor and lamp circuits, a switch in each of said lamp circuits one of which is normally opened and the other normally closed, means movable in one direction to actuate said normally open switches to close the motor circuit and the circuit through one lamp and to open said normal-

ly closed switch in the other lamp circuit, means adapted to connect said movable means to said motor upon completion of said movement in one direction for operation by the motor in the opposite direction, whereby the switches in said lamp circuits will be actuated to restore same to normal positions after a predetermined return movement of said movable means and thereafter to restore said motor circuit switch to open position.

9. The structure set forth in claim 8, and coin operated means adapted to disconnect said movable means from said motor.

10. The structure as set forth in claim 8, in which the means for connecting the movable means to the motor is a clutch and a drive shaft, and coin operated means adapted to disconnect said clutch from said shaft.

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