July 15, 1941. F. I. DU PONT 2,249,350

PARKING-TIME METER

Filed April 14, 1939 4 Sheets-Sheet 1

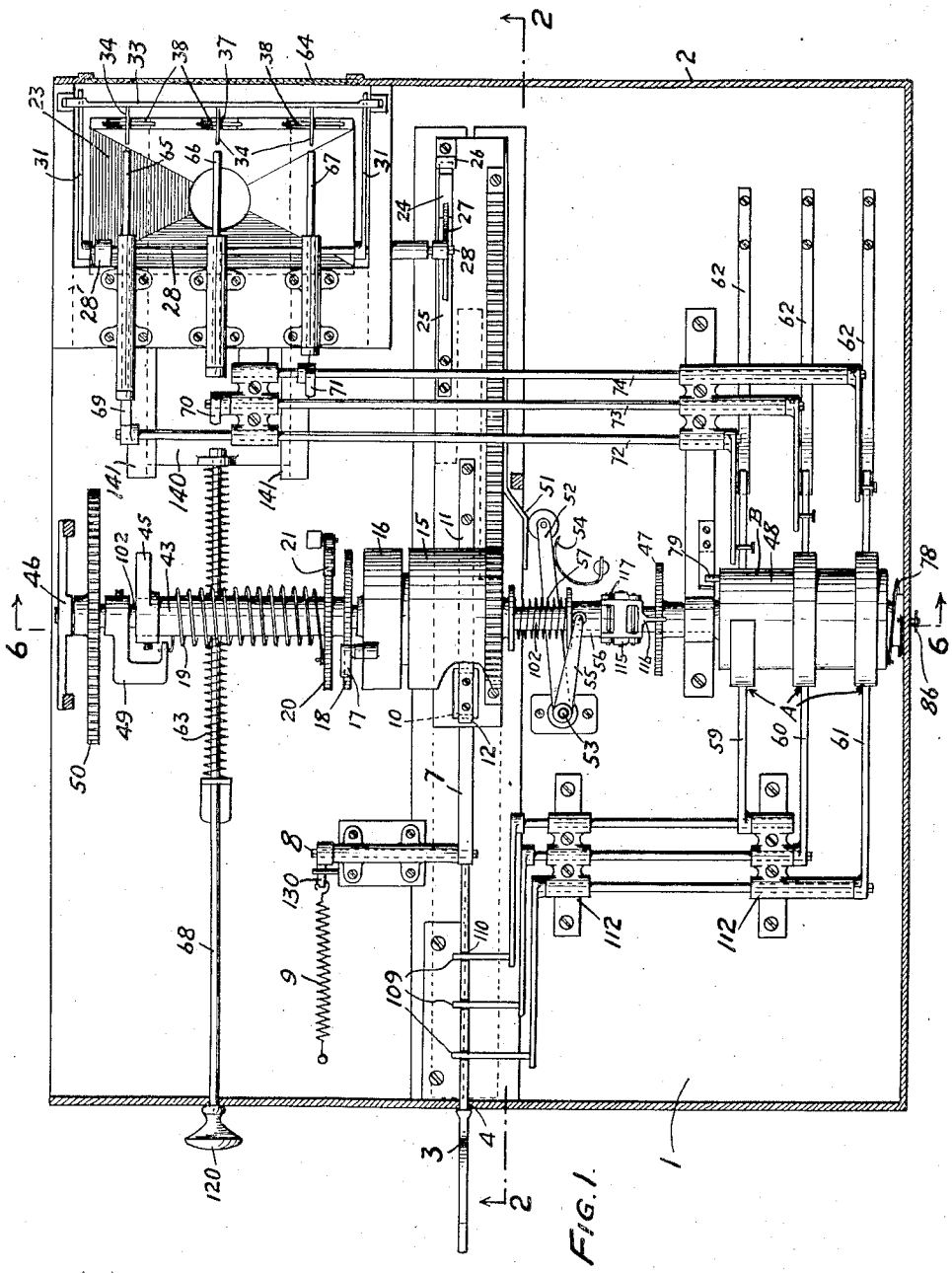


FIG. 1.

INVENTOR

Francis I. du Pont

BY

Bussey & Harding

ATTORNEYS.

WITNESS:

Robt. R. Kitchel

July 15, 1941. F. I. DU PONT 2,249,350

PARKING-TIME METER

Filed April 14, 1939 4 Sheets-Sheet 2

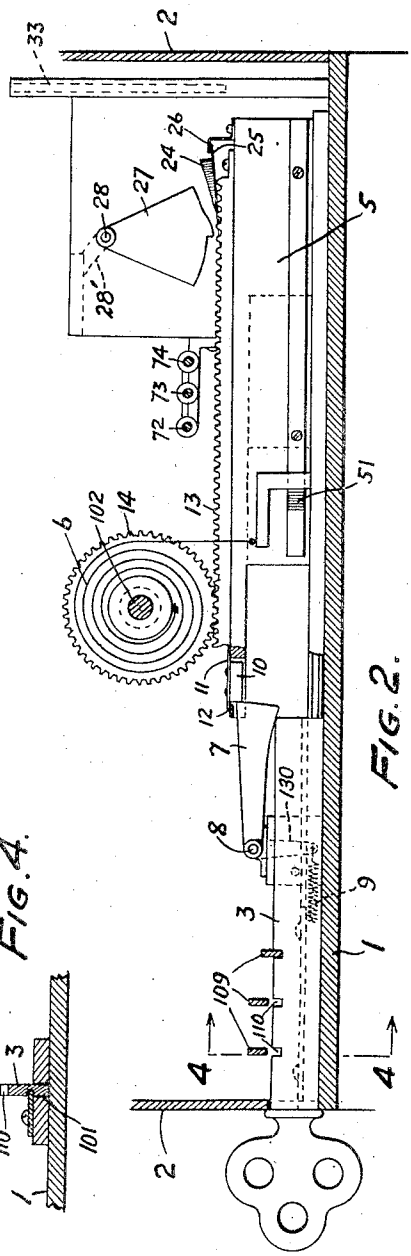


FIG. 2.

FIG. 4.

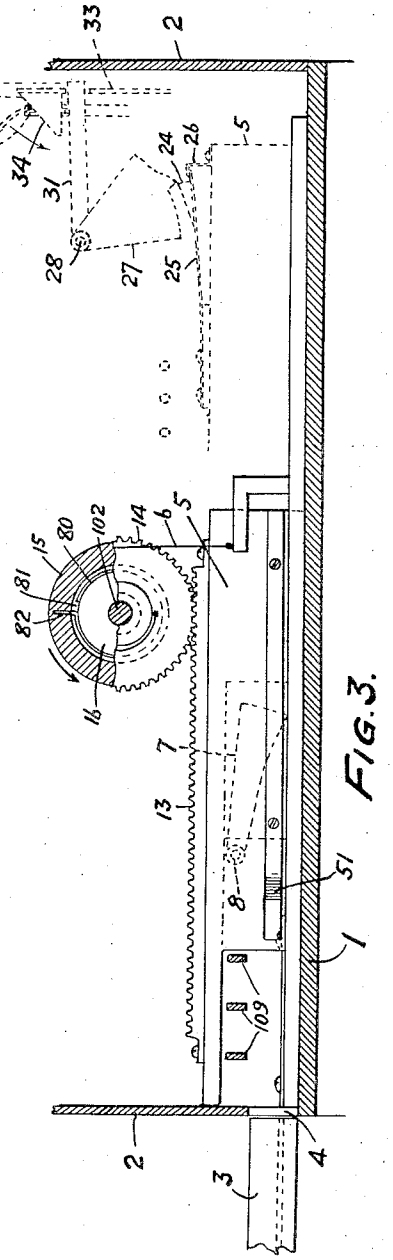


FIG. 3.

WITNESS:

Robt. A. Mitchell

INVENTOR

Francis I. du Pont

BY

Brown Harding

ATTORNEYS.

July 15, 1941. F. I. DU PONT 2,249,350

PARKING-TIME METER

Filed April 14, 1939 4 Sheets-Sheet 3

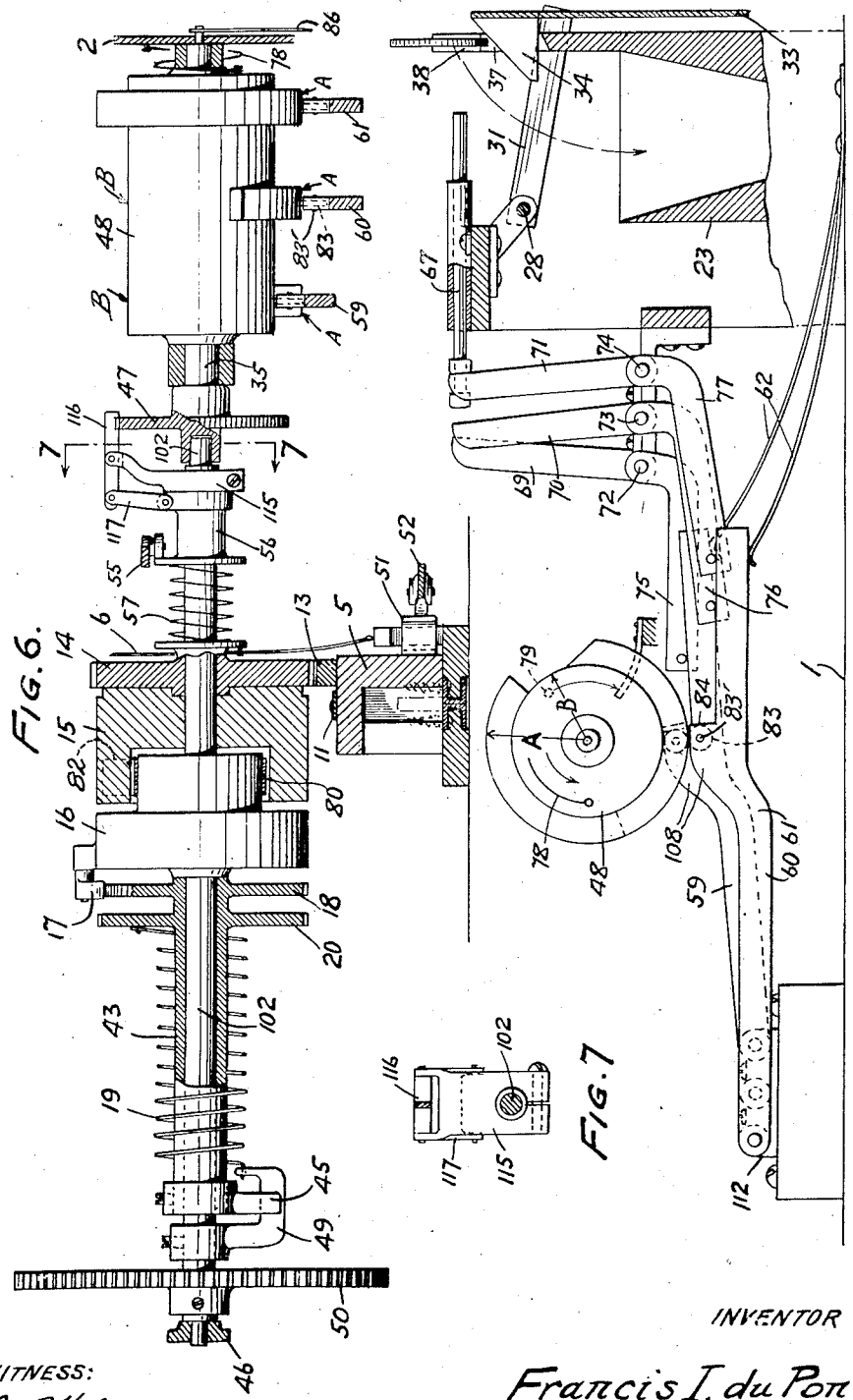


FIG. 6.

FIG. 5.

FIG. 7

WITNESS:

INVENTOR

Francis I. du Pont

BY

ATTORNEYS.

July 15, 1941. F. I. DU PONT 2,249,350

PARKING-TIME METER

Filed April 14, 1939 4 Sheets-Sheet 4

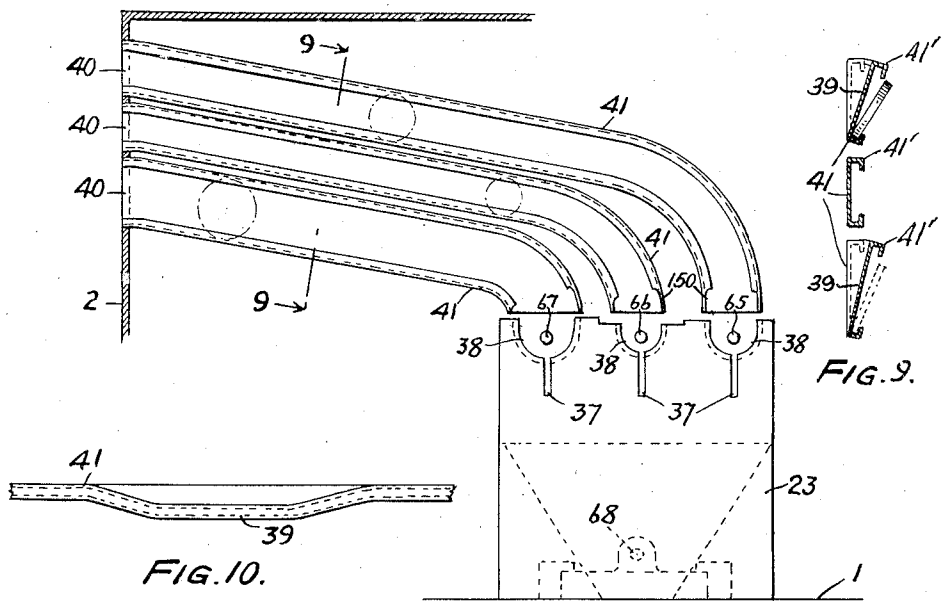


FIG. 8.

FIG. 10.

FIG. 9.

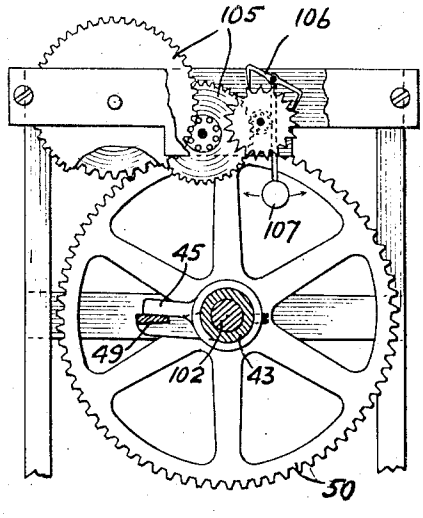


FIG. 11.

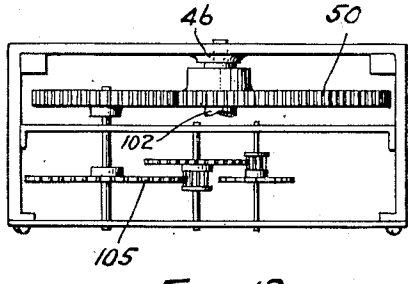


FIG. 12.

INVENTOR

Francis I. du Pont

BY

Burton Harding

ATTORNEYS.

WITNESS:

Robt. R. Mitchell

Patented July 15, 1941 2,249,350

UNITED STATES PATENT OFFICE

2,249,350

PARKING-TIME METER

Francis I. du Pont, Wilmington, Del., assignor to Delaware Chemical Engineering Company, Wilmington, Del., a corporation of Delaware

Application April 14, 1939, Serial No. 267,844

21 Claims. (Cl. 194—78)

My invention relates to a new and improved type of parking-time meter; more specifically an instrument by which the time during which an automobile may be parked in a busy street can be measured and compensation automatically exacted.

Of late years the principle has come to be recognized that when an automobilist uses the public streets to park his car and so interferes with the business on these streets, he should pay an amount based on the value of the parking privilege.

My invention provides a simple and effective way in which this can be done. Thus, the city can provide each resident automobile owner with a key which will fit any of the parking meters. Upon parking his car, the automobilist inserts his key into the meter. If, within say, for example, 15 minutes, he wishes to leave, he can withdraw his key without depositing any money. The first 15 minutes is free. If he stays over 15 minutes, but less than, for example, 30 minutes, he finds that he cannot withdraw his key without depositing 5 cents. If he stays longer than 30 minutes. but less than, for example, one hour, it will require a deposit of 5 cents plus 10 cents in order to withdraw the key. If he stays one hour or longer, it will require 5 cents plus 10 cents plus 25 cents in order to withdraw the key.

The city, or any company to which the city may delegate the franchise, can sell the keys to automobile owners for, say, for example, $1.00 and each key can be marked with an identifying number.

The time periods and amounts given above are merely suggestive and can, of course, be varied according to how busy the street may be.

Generally speaking, in the parking-time meter according to my invention, the insertion of a key into the meter winds a clock mechanism which automatically starts. The clock mechanism controls the actuation of means whereby the key is locked into the meter and coin controlled means are provided for releasing the key. The insertion of the key also causes the coins deposited by the last user to fall into a coin receiving box.

Having now indicated in a general way the nature and purpose of this invention, I will proceed to a detailed description of a preferred embodiment thereof with reference to the accompanying drawings, in which:

Figure 1 is a plan view, partly in section, of a parking-time meter embodying this invention.

Figure 2 is a sectional view on line 2—2, Figure 1.

Figure 3 is a sectional view similar to that of Figure 2, with the key withdrawn.

Figure 4 is a sectional view on line 4—4, Figure 2.

Figure 5 is a side view, partly in section, showing details of construction of coin controlled mechanism.

Figure 6 is a sectional view on line 6—6, Figure 1.

Figure 7 is a sectional view on line 7—7, Fig. ure 6.

Figure 8 is a view, partly in section, of coin introducing guideways.

Figure 9 is a sectional view on line 9—9, Figure 8.

Figure 10 is an enlarged top view of one of the coin introducing guideways.

Figure 11 is a view, partly in section, of clockwork mechanism.

Figure 12 is a plan view of the showing of Figure 11.

In the drawings 1 is the floor or bed plate which carries the mechanism. 2 indicates the sides or walls of the casing which houses the mechanism. 3 is the automobilist's key, which is inserted through the keyhole 4, which aligns with a guideway 101 for the key. Upon insertion of the key it encounters the sliding carriage 5, which is pushed forward by a spring 6, acting on the carriage through gear 14, mounted on a shaft 102, which engages rack 13 on the carriage and which causes the carriage to resist the force of inserting the key. The key when fully entered causes the carriage 5 to recede the full distance determined by the length of the key. If the key is not pushed all the way in, then the carriage actuated by the spring 6, which is tightened as the carriage recedes, will push the key out again. Thus, the key cannot be left part way in, but must be pushed home or it will spring out.

When the key is pushed all the way in it raises the dog 7, which is carried on an end of shaft 8, whose bearings are rigidly connected with the bed plate of the instrument. The dog 7, when the key is out, is kept down by the spring 9 acting on the lever 130 which is secured to the end of shaft 8 opposite to the dog 7. When the key is entered, it lifts the dog 7 which engages a latch 10 mounted on the carriage 5 and is pressed downward by the spring 11 against a limiting stop 12 upon the carriage. The latch 10 yields as the dog 7 rises under the action of the key until the

latch passes just over the end of the dog 7 when it snaps down with a ratchet-like effect into engagement with the end of the dog 7, as shown in Figure 2. The carriage is thus held in its fully receded position as long as the dog 7 is held up by the end of the key 3. Upon withdrawing the key, the spring 9 causes the dog 7 to take its normal position releasing the latch 10. The carriage then actuated by the spring 6 moves forward following the key as it is withdrawn and assumes the position occupied before the insertion of the key.

The rack 13 on the carriage 5 and which engages the gear 14 rotatably mounted on shaft 102 acts to wind up a clock mechanism including a spring 19 and an escapement mechanism 106.

Between the gear 14 and the clock mechanism is a friction clutch, which yields if the clock mechanism is wound up, thereby permitting the key to be fully inserted even if the clock spring cannot be further wound up.

The friction clutch consists of two members, member 15 loosely mounted on shaft 102 and frictionally connected with the gear wheel 14, and member 16 loosely mounted on shaft 102 and which carries a pawl 17 engaging a ratchet wheel 18 on a sleeve 43 mounted on shaft 102, which acts to wind the clock spring 19 carried on the sleeve 43. 20 is a second ratchet wheel on sleeve 43 adjacent to ratchet wheel 18, whose pawl 21 is mounted on the bed plate 1 of the instrument. One end of the spring 19 is secured to a face of the ratchet wheel 20, while the other end is secured to a lug 49 on the shaft 102. The pawl 21 acts to hold the ratchet wheel 20, thus preventing the clock spring 19 from unwinding except as it operates the escapement mechanism to be described hereinafter regardless of any movement of the gear wheel 14 as it is turned by the rack 13.

Referring now to the friction clutch comprising members 15, 16 which I have found satisfactory, in Figures 3 and 6, 80 is a circular piece of steel or spring brass cut at the point 81 and so made that it will grip the member 16 with a tension sufficient to insure the winding of the spring 19, but not so excessive as to require undue force to push in he key 3 if the spring 19 is already wound up. It is very important that the circular piece 80 be so held in member 15 by the projection 82, which is part of 80, that the rotation of member 15 when member 16 is stationary will tend to loosen the grip of 80 upon member 16. If it is held the other way then 80 will grip 16 so tight that it is nearly impossible for 15 to slide on 16. If the condition just mentioned is provided then the force by which 15 turns 16 will be constant and will depend on the tension with which 80 grips 16 and will not increase wih the resistance offered by the friction.

I have found that when 16, or that part of 16 which is gripped by 80, is made of hard wood, the performance is excellent. Alternatively, it could be made in a series of discs of leather clamped together and turned perfectly cylindrical by means of a lathe or in other form.

A coin receptacle 23 is provided with coin holding recesses 38, different sizes for coins of different values, adapted to receive coins from chutes 41 communicating with coin insertion openings 40 in a wall 2 of the casing. The coin chutes 41 are provided with coin retaining flanges 41'. The faces of the flanges are, however, cut away for a distance above the recesses 38 as shown at 150, Fig. 8, to permit removal of coins from the recesses 38 by means to be hereinafter described. As will be described, coins deposited through the openings 40 and having passed down the chutes 41 into the recesses 38 will be discharged therefrom when the key is inserted in the guideway 101 and, as will be described, the presence of coins in the recesses 38 will enable release of the key, through the medium of hand knob 120, after it has become locked in the guideway.

As the carriage 5 is pushed back by the key, it causes whatever coins are in the coin-holding recess 38 to fall into the coin box or receptacle 23 from which they can be from time to time collected. This is accomplished by the following mechanism. Upon the carriage 5 is a pawl 24 which is pressed upward by means of the spring 25, against a limiting stop 26. In the travel of the carriage as it is pushed back by the key, the pawl 24 encounters the single ratchet tooth on the cam 27 and causes the cam 27 to turn its shaft 28, whose bearings 28' are rigidly mounted on the bed plate 1. When in the travel of the carriage 5 the pawl 24 has moved the cam through a certain definite angle, the tooth on the cam will have risen above and become free of the pawl 24 which has then passed beyond the cam. The cam 27 having performed its function, about to be described, returns to its original normal position. When the key is withdrawn and the carriage 5 moves forward, the latch passes backward over the ratchet tooth of the cam 27, yielding like any ratchet passing over the tooth of a ratchet wheel. Upon the shaft 28 are two levers 31, whose purpose is to lift the member 33 which is capable of a limited vertical motion and carries three lugs 34, whose edges are inclined about 45° from the horizontal. These lugs project through three slots 37 in the coin receptacle 23 below the semi-circular recesses 38 designed to receive the coins from the guideways 41 after they are dropped through the coin insertion slots 40 in the top of the casing which houses the mechanism.

The guideways for the larger coins are distorted at an angle at a point in their extension, as shown at 39, Figures 9 and 10, in order to drop out small coins before they reach the coin actuated mechanism.

When the cam 27 is turned by the pawl 24, the member 33 rises and its projections dislodge any coins in the recesses 38 allowing them, in view of the cutting away of the faces of flanges 41' of the chutes 41, to fall into the coin box 23.

The clock mechanism hereinbefore referred to is adapted to actuate shaft mechanism 102, upon which are loosely mouned the members 14, 15 and 16.

The shaft 102 has one of its bearings at 46 and for the other bearing projects into the hub of a member 47 which is provided with a toothed periphery and is rigidly mounted on the shaft 35 of the triple cam 48. Rigidly mounted upon shaft 102 is the lug 49, which holds the end of the main spring 19, whose other end is held by the ratchet wheel 20, as has been described. Upon the sleeve 43 is rigidly fastened a stop member 45, whose purpose is to limit the rotation of shaft 102 under the influence of the spring 19 to one revolution, as that is all that is required for the operation of the triple cam 48.

When the spring 19 is wound up, the stop member 45 strikes the lug 49 at the point indicated in the drawing, and any further turning of the wheel 14 as the carriage 5 recedes ahead of key 3, will only cause friction member 15 to slip upon member 16.

The gear wheel 50, rigidly mounted upon the shaft 102, is connected through gearing 105 to an escapement mechanism 106 which can be of any form used for clocks, provided that it will start itself without the necessity for independently starting the balance wheel or pendulum 107.

When the spring 19 has been wound up, the pawl 21 of the ratchet wheel 20 holds the sleeve 43, the ratchet wheel 20 and stop member 45 mounted thereon stationary, while the spring 19 causes the lug 49 and shaft 102, to which lug 49 is secured to make one revolution. The time of revolution is determined by the escapement.

As the carriage 5, moved by the insertion of the key 3, nears the end of its inward travel, a lug 51 upon the carriage 5, having an inclined surface, pushes the end of a lever 52 which carries a small roller to lessen friction. Lever 52 is mounted on a vertical shaft 53 and is pressed, by the spring 54, against the side of the carriage 5, its roller rolling upon the side of the carriage until it encounters the lug 51. When lug 51 contacts the lever 52 and pushes it against the action of spring 54 the vertical shaft 53 is turned. The vertical shaft 53 carries another lever 55 provided at its free end with a roller which engages the sleeve 56 normally holding it back against the action of spring 57. The sleeve 56 is slidably mounted on shaft 102, permitting the member 56 to slide longitudinally of the shaft. A member 115 secured to shaft 102 provides a fulcrum for a lever 116 connected by a link 117 to the member 56.

When the lever 55 moves as a result of the lug 51 actuating the lever 52 as the carriage 5 is moved inward, the sleeve 56 is released and the spring 57 causes it to move longitudinally, causing lever 116 to turn on its fulcrum to engage the toothed periphery of the member 47, whereupon the triple cam 48 begins to revolve with the shaft 102, which, as described, is rotated by the spring 19 under control of the escapement mechanism.

The triple cam 48 comprises three different cams which are fastened together in one piece. Each of these has circular cam surfaces of two different radii, designated in the drawings as radius A and radius B. Rollers 83, carried by cam followers 108 formed by extensions of levers 59, 60 and 61, which levers are connected to detents 109, are pressed against these cam surfaces by a spring 62. The length of time during which any of these levers remains in position to maintain the detent 109, to which it is connected, out of locking engagement with the key 3 depends upon the length of the cam having the radius A. When the cam has revolved to the point where the shortest curved surface having a radius A ends, the cam follower on the lever 59 snaps upward under the influence of its spring 62 and rides on the curved surface of radius B. When this happens the detent 109 on the end of the lever 59 drops into one of the notches 110 in the key, as shown in Figure 2. The levers 59, 60 and 61 are fulcrumed in bearings 112 carried by the base 1. If the cam 48 further revolves, with the passage of time, the levers 60 and 61 act successively in the same way and the key is locked in its guideway, by engagement of detents 109 on levers 60 and 61 in slots 110 in the key and cannot be withdrawn unless all three of the levers are moved back to their normal position.

I will now describe the mechanism by which, with the aid of coins dropped into slots in the instrument, the levers are moved to normal position.

While the particular coins I mention, for illustrative purposes, are not the only ones which could be used, they seem to be the ones most likely to be needed and, therefore, the instrument is shown as constructed to use these coins in the order mentioned. It has seemed also that three different kinds of coins would most likely meet the requirements and, therefore, I have shown a triple cam and three notches in the key. It is obvious, of course, that a larger or smaller number could be used.

The coin holder 23 is mounted on a slide 140 adapted to slide in guides 141, is normally held by the spring 63 against the outer wall of the casing of the instrument and a glass window 64 permits the coins dropped in by the last user of the instrument to be seen until, by the insertion of a key by the next user, they are dislodged as has been described. The coin holder 23 can be moved horizontally for a certain distance against the action of spring 63 by the rod 68 secured to the slide 140 which terminates in a hand knob 120 outside the wall of the instrument casing.

Located opposite to the semi-circular coin receiving recesses 38 in the coin holder 23 are three rods 65, 66 and 67. These are mounted so that they can move longitudinally and if a coin or coins are in the coin holder, the flat surface of the coin or coins will, upon pulling the knob on the rod 68 and moving the coin holder horizontally, move one or all of the rods 65, 66 and 67, but if no coin is in the semicircular recesses of the coin holder 23, then, since there is nothing to move the rods 65, 66 and 67, no mechanism is operated when the knob on rod 68 is pulled.

If one or more coins are in the coin recesses 38, then upon pulling the knob on the rod 68, the rods 65, 66 and 67, or any one or two of them, depending upon the number of coins, will push one or more of the levers 69, 70, 71, which, by means of the shafts 72, 73, 74 will cause one or more of the levers 75, 76, 77 to depress one or more of the levers 59, 60, 61 and lift one or more of the detents 109 out of the slots 110 in the key, permitting the same to be removed from the instrument.

It is necessary to provide that the triple cam 48 shall always start moving from a zero point; in order that the times for the detents dropping into the slots in the key 3 shall always be according to the predetermined scheme. This is taken care of by having a spring 78 very much weaker than the main clock spring 19, but strong enough to insure that when the members 56—47 release the cam it will return to its normal position which is determined by the stop 79. An indicator 86 indicates the position of the triple cam 48.

There are several details of this instrument which require more particular description. These are the main spring 19 of the clock mechanism, the spring 6, which causes the carriage 5 to follow the key 3 as it is withdrawn, and the spring 78 which causes the cam 48 to return to its zero position after being released, also the friction members 15 and 16, the purpose of which has been explained.

The three springs above mentioned should, in order that the mechanism may work well and with certainty, have a tension at the beginning of their path of action not too much greater than the tension at the end of their path of ac-

tion. To accomplish this with a longitudinally stretched spiral spring is not practical as it would require a spring of excessive length. I prefer a spring like that of an ordinary window shade roller. I have found that in the case of the main clock spring 19 if this be wound up five complete revolutions and only permitted to function through one revolution, then the conditions are entirely favorable.

At the beginning of the path of action of this spring it will have the tension due to five turns of winding and at the end will have the tension due to four turns of winding. The same should apply to the other springs mentioned above.

It has been pointed out that in order to provide that the triple cam 48 shall return to its zero point when the key 3 is withdrawn, the spring 78 shall be much weaker than the main clock spring 19. I have found it possible to arrange the springs this way so that the machine functions perfectly, but I think it well to mention an arrangement which will insure the desired performance even if there is not quite so great a difference between the tension of the main clock spring 19 and the spring 78.

The cam followers 108 on the levers 59, 60, 61 may each be provided with a small roller, as shown, which will roll upon the curved surfaces of the cam 48. Each roller 83 projects only slightly above the cam follower as shown and is positioned close to the end 84 of the cam follower. The reason for this is that it is desirable that the levers 59, 60, 61 shall snap upward sharply as soon as the end of each curved surface of radius A is reached and the slight interval of rubbing friction when the end of any curved surface of the larger radius on the cam 48 passes the wheel 83, but has not yet passed the corner 84 of the lug, will make no difference.

If the anti-friction devices just described are provided, the cam 48, as soon as the clutch member 56 is pushed back from the clutch member 47 by the means already described, will snap back to its zero position under the influence of a very weak spring 78 even if the lugs on one or two of the levers are riding on the curved surface of the cam.

As has been mentioned, the escapement which determines the time of revolution of the cam 48 must be of the kind that will start itself as soon as it feels the pressure of the main clock spring 19. This kind of escapement is well known to clock makers and is used to ring the alarm on alarm clocks.

As will now be obvious, when one parks his car in front of a meter in accordance with this invention, the space being unoccupied, the guideway for reception of the key 3 will be clear, since the detents 109 will be in raised position under the influence of the three cams on radius A on the cam member 48. The spring 19 may be more or less wound up, entirely run down or completely wound up. When the parker inserts the key 3 in the guideway, the carriage will be pushed back to the position shown in Figure 1 and the spring 19 will be wound to the extent necessary to bring it to fully wound position. If the spring is partially wound when the key is inserted, its winding will be completed, but it will not be overwound due to the action of the friction clutch comprising the gear wheel 14 and the member 15, and the lever 116 will be engaged with the toothed wheel 47 connecting the cam member 48 with the shaft 102, which will be set in motion to rotate the cam member by the spring 19 under control of the escapement 106.

Until the cam member has rotated sufficiently to release one of the detents 109 to locking engagement with the key, i. e., until the cam follower of lever 59 leaves the shortest of the cams on radius A, the key may be withdrawn. After predetermined periods of time, as fifteen minutes, thirty minutes and one hour, regulated by the escapement mechanism, as in an ordinary clock, the detents 109 will successively engage the key by virtue of the followers on the levers 59, 60 and 61 leaving their respective cams on the radius A.

Assuming that the time during which the key might be freely removed was fifteen minutes and that the total time of parking was an hour and fifteen minutes so that all three of the detents shown in Figure 1 were released to engage the key 3, the parker deposits into the three coin chutes through the apertures 40 say, for example, five, ten and twenty-five cents. The coins falling in the coin chutes engage in the coin recesses 38. The parker then pulls the rod 68 by grasping and pulling upon the knob 120. Such results in drawing the coin receptacle 23 forward, the rods 65, 66 and 67 are moved by contact with the coins in the movement of the receptacle, effect depression of the levers 59, 60 and 61, through the medium of levers 69, 70 and 71, shafts 72, 73 and 74 and levers 75, 76 and 77, thus raising the detents 109 out of engagement with the key, which may then be freely withdrawn. On withdrawal of the key, the dog 7 falls and the carriage moves forward under the influence of spring 6. The forward movement of the carriage releases lever 52, which, under the influence of spring 54, moves to release the lever 116 from the toothed wheel 47. The cam 48 is then returned to its initial position by a spring 78 and the cam followers of levers 59, 60 and 61 are returned to engagement with the surface on radius B by springs 62.

On insertion of a key into the device by a subsequent parker, when the carriage is pushed back by the key, coins deposited in the recesses 38 of the coin receptacle are discharged from the recesses 38 by the lugs 34, which are raised in the slots 37 by the rotation of shaft 28, to which they are attached by levers 31, by the effect of pawl 24 on cam 27 in the backward movement of the carriage.

As will now be observed, this invention from the broad standpoint relates to a packing-time meter comprising an element or device adapted to be located at a locus for parking, the element or device being adapted for the reception of a portable element, as a key. The device is so constructed that when the portable element or key is entered into it means are rendered operable or are set in operation whereby after a lapse of time the portable element or key is secured or locked in the element or device, further means being provided whereby through the medium of a coin or coins the portable element or key may be released for withdrawal from the element or device.

It will be appreciated that it is not intended that this invention shall be limited to the particular details of construction described above in connection with the above description of a preferred embodiment for illustrative purposes, since it will be obvious that various modification in detail may be made without departing from the scope of the invention.

What I claim and desire to protect by Letters Patent is:

1. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the reception of a

portable element, a plurality of locking means, a prime mover, means forming operative connection between said prime mover and said locking means respectively, the prime mover being adapted to be rendered operable by the portable element on its entry into the guideway to cause said locking means respectively to successively engage the portable element after the lapse of successive periods of time and coin controlled means for releasing said locking means.

2. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the reception of a portable element, a plurality of locking means, a prime mover, means forming operative connection between said prime mover and said locking means respectively, the prime mover being adapted to be rendered operable by the portable element on its entry into the guideway to cause said locking means respectively to successively engage the portable element after the lapse of successive periods of time and means rendered operable by coins of different values for releasing said locking means respectively.

3. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the reception of a portable element, a detent movable into and out of position to engage said portable element to lock it in said guideway, a cam adapted to control said detent, spring actuated mechanism for driving said cam from an initial position in which said detent will be clear of said portable element to a position in which said detent may engage said portable element, means in the path of said portable element in traversing said guideway to render said spring actuated mechanism operable by said portable element, coin controlled means for releasing said detent from engagement with said portable element thereby permitting withdrawal of said portable element from the guideway and means operable on withdrawal of said portable element from the guideway to return said cam to its initial position.

4. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the reception of a portable key, a clockwork mechanism including a spring, means operable by the key as it traverses the guideway to effect a winding of said spring, locking means for locking the key in the guideway, means operated by said clockwork mechanism for actuating said locking means, means actuated by the key on traversing said guideway for rendering said clockwork mechanism operable to operate said locking means and means for releasing said locking means.

5. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the reception of a key, a clockwork mechanism including a spring, means adapted to be displaced as the key traverses the guideway, means including a friction clutch and affording a connection between said means adapted to be displaced by the key and said spring for effecting winding of said spring as said means adapted to be displaced by the key is displaced by the key, means for locking said key in the guideway, cam means actuated by said clockwork mechanism for controlling said locking means, means for releasing said locking means, coin controlled means for actuating said releasing means and means operable on withdrawal of the key from the guideway for returning said cam means to initial position.

6. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising means for the reception of a portable element, mechanical means for storing energy, means actuated by insertion of the portable element in said means for its reception for transmitting energy to said means for storing energy, means rendered operable under the influence of energy from said means for storing energy to secure the portable element to the fixed element when the portable element is fully entered in said means for its reception and means for releasing the portable element and permitting its withdrawal from said means for its reception.

7. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising means for the reception of a portable element, a tension member, means actuated by insertion of the portable element in said means for its reception for placing the tension member under tension, securing means rendered operable by the tension member when under tension for locking the portable element to the fixed element when the portable element is fully entered in said means for its reception and means for releasing the portable element and permitting its withdrawal from said means for its reception.

8. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising means for the reception of a portable element, a tension member, means actuated by the portable element for placing the tension member under tension, securing means rendered operable by the tension member when under tension for locking the portable element to the fixed element when the portable element is fully entered in said means for its reception, means operatively connected with said tension member for delaying the operation of said securing means and means for releasing the portable element and permitting its withdrawal from said means for its reception.

9. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the insertion of a portable element, means adapted to resist entry of the portable element into the guideway, locking means operable only when the portable element is fully entered in the guideway to render said means adapted to resist entry of the portable element into the guideway inoperative, means for storing energy, means operable by the portable element in its entry into the guideway for transmitting energy to said means for storing energy, means rendered operable under the influence of energy from said means for storing energy when the portable element is fully entered in the guideway to secure the portable element to the fixed element and means for releasing the portable element.

10. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the insertion of a portable element, means adapted to resist insertion of the portable element into the guideway, locking means operable only when the portable element is fully entered in the guideway to render said means adapted to resist entry of the portable element into the guideway inoperative, means for storing energy, means operable by the portable element in its insertion into the guideway for transmitting energy to said means for storing energy, means including an escapement mechanism controlled by the portable element and rendered operable by said means for stor-

ing energy for locking the portable element to the fixed element when the portable element is fully entered in said guideway and means for releasing the portable element.

11. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the insertion of a portable element, means adapted to resist insertion of the portable element into the guideway, locking means operable only when the portable element is fully entered in the guideway to render said means adapted to resist entry of the portable element into the guideway inoperative, means for storing energy, means operable by the portable element in its entry into the guideway for transmitting energy to said means for storing energy, means controlled by the portable element and rendered operable by said means for storing energy for locking the portable element to the fixed element when the portable element is fully entered in said guideway, means operatively connected to said means for storing energy for delaying the operation of said last mentioned means and coin controlled means for releasing said means for locking the portable element to the fixed element.

12. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the insertion of a portable element, a tension member arranged to be put under tension by insertion of the portable element into the guideway, means controlled by the portable element and rendered operable by said tension means only when the portable element is fully entered in the guideway for locking the portable element to the fixed element and means for releasing the portable element to permit its withdrawal from the guideway.

13. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising means for the reception of a portable element, mechanical means for storing energy, means actuated by the portable element for transmitting energy to said means for storing energy and means rendered operable under the influence of energy from said means for storing energy to secure the portable element to the fixed element, means operably connected with said means for storing energy for delaying the operation of said securing means and means for releasing the portable element.

14. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising means for the reception of a portable element, mechanical means for storing energy, means controlled by the portable element for transmitting energy to said means for storing energy and a plurality of means rendered operable successively under the influence of energy from said means for storing energy to secure the portable element to the fixed element when the portable element is fully entered in said means for its reception and means for releasing the portable element.

15. In a parking-time meter an element adapted to be fixedly located at a locus for parking and comprising a guideway for the insertion of a portable element, a tension member arranged to be put under tension by insertion of the portable element into the guideway, a plurality of means controlled by the portable element and rendered operable successively by said tension means only when the portable element is fully entered in the guideway for locking the portable element to the fixed element and means for releasing the portable element to permit its withdrawal from the guideway.

16. In a parking time meter an element adapted to be fixedly located at a locus for parking comprising a guideway for the reception of a key, a movable carriage in the path of a key entering the guideway, tension means operative on the carriage and tending to resist movement thereof when a key is entered in the guideway, a latch arranged to be positioned by a key when fully entered in the guideway to prevent movement of the carriage, said latch being arranged to be released by withdrawal of the key, a prime mover, locking means for locking a key fully entered in said guideway, means affording an operative connection between said prime mover and said locking means and adapted to be rendered operative only when the above mentioned latch is positioned to prevent movement of the carriage and coin controlled mechanism for releasing said locking means.

17. In a parking time meter an element adapted to be fixedly located at a locus for parking comprising a guideway for the reception of a key, a movable carriage in the path of a key entering the guideway, tension means operative on the carriage and tending to resist movement thereof when a key is entered in the guideway, a latch adapted to be positioned by a key when fully entered in the guideway to prevent movement of the carriage, a spring, means affording an operative connection between said spring and said carriage whereby when said carriage is moved by the entry of a key into said guideway said spring will be tensioned, locking means for locking a key fully entered in said guideway, an operative connection including a normally disengaged clutch between said spring and said locking means, means carried by the carriage for engaging said clutch when a key is fully entered in said guideway to render said locking means operable by said spring and means for releasing said locking means.

18. In a parking time meter an element adapted to be fixedly located at a locus for parking comprising a guideway for the reception of a key, a movable carriage in the path of a key entering the guideway, tension means operative on the carriage and tending to resist movement thereof when a key is entered in the guideway, a latch adapted to be positioned by a key when fully entered in the guideway to prevent movement of the carriage, a spring, means affording an operative connection between said spring and said carriage whereby when said carriage is moved by the entry of a key into said guideway said spring will be tensioned, a plurality of separate locking means for locking a key fully entered in said guideway, operative connection, including a plurality of rotatable cams of different length arranged to control said locking means respectively, between said spring and said locking means and adapted to be rendered operative when a key is fully entered in said guideway to rotate said cams and engage said locking means successively with the key and means for releasing said locking means.

19. In a parking time meter an element adapted to be fixedly located at a locus for parking comprising a guideway for the reception of a key, a movable carriage in the path of a key entering the guideway, tension means operative on the carriage and tending to resist movement thereof when a key is entered in the guideway, a latch adapted to be positioned by a key when fully

entered in the guideway to prevent movement of the carriage, a spring, means affording an operative connection between said spring and said carriage whereby when said carriage is moved by the entry of a key into said guideway said spring will be tensioned, a plurality of separate locking means for locking a key fully entered in said guideway, operative connection, including an escapement mechanism and a plurality of rotatable cams of different length arranged to control said locking means respectively, between said spring and said locking means and rendered operative when a key is fully entered in said guideway to rotate said cams, at a rate controlled by said escapement mechanism, to engage said locking means successively with the key and means for releasing said locking means.

20. In a parking time meter an element adapted to be fixedly located at a locus for parking comprising a guideway for the reception of a key, a movable carriage in the path of a key entering the guideway, tension means operative on the carriage and tending to resist movement thereof when a key is entered in the guideway, a latch adapted to be positioned by a key when fully entered in the guideway to prevent movement of the carriage, a spring, means including friction members affording an operative connection between said spring and said carriage whereby when said carriage is moved by the entry of a key into said guideway said spring will be tensioned, locking means for locking a key fully entered in said guideway, an operative connection between said spring and said locking means, means carried by the carriage for rendering said locking means operable by said spring when a key is fully entered in said guideway and means for releasing said locking means.

21. In a parking time meter an element adapted to be fixedly located at a locus for parking comprising a guideway for the reception of a key, a movable carriage in the path of a key entering the guideway, tension means operative on the carriage and tending to resist movement thereof when a key is entered in the guideway, a latch adapted to be positioned by a key when fully entered in the guideway to prevent movement of the carriage, a spring, means affording an operative connection between said spring and said carriage whereby when said carriage is moved by the entry of a key into said guideway said spring will be tensioned, a plurality of separate locking means for locking a key fully entered in said guideway, an operative connection, including a normally disengaged clutch and a plurality of rotatable cams of different length arranged to control said locking means respectively, between said spring and said locking means, means carried by the carriage to effect engagement of said clutch when a key is fully entered in said guideway to effect rotation of said cams to engage said locking means successively with the key, means for releasing said locking means, means for disengaging said clutch on withdrawal of the key from the guideway and tension means operatively connected with said cams and adapted to return them to an initial position when said clutch is disengaged.

FRANCIS I. DU PONT.