Dec. 15, 1964 J. J. SULLIVAN 3,161,275

MECHANICAL PARKING ATTENDANT

Filed May 17, 1960 5 Sheets-Sheet 1

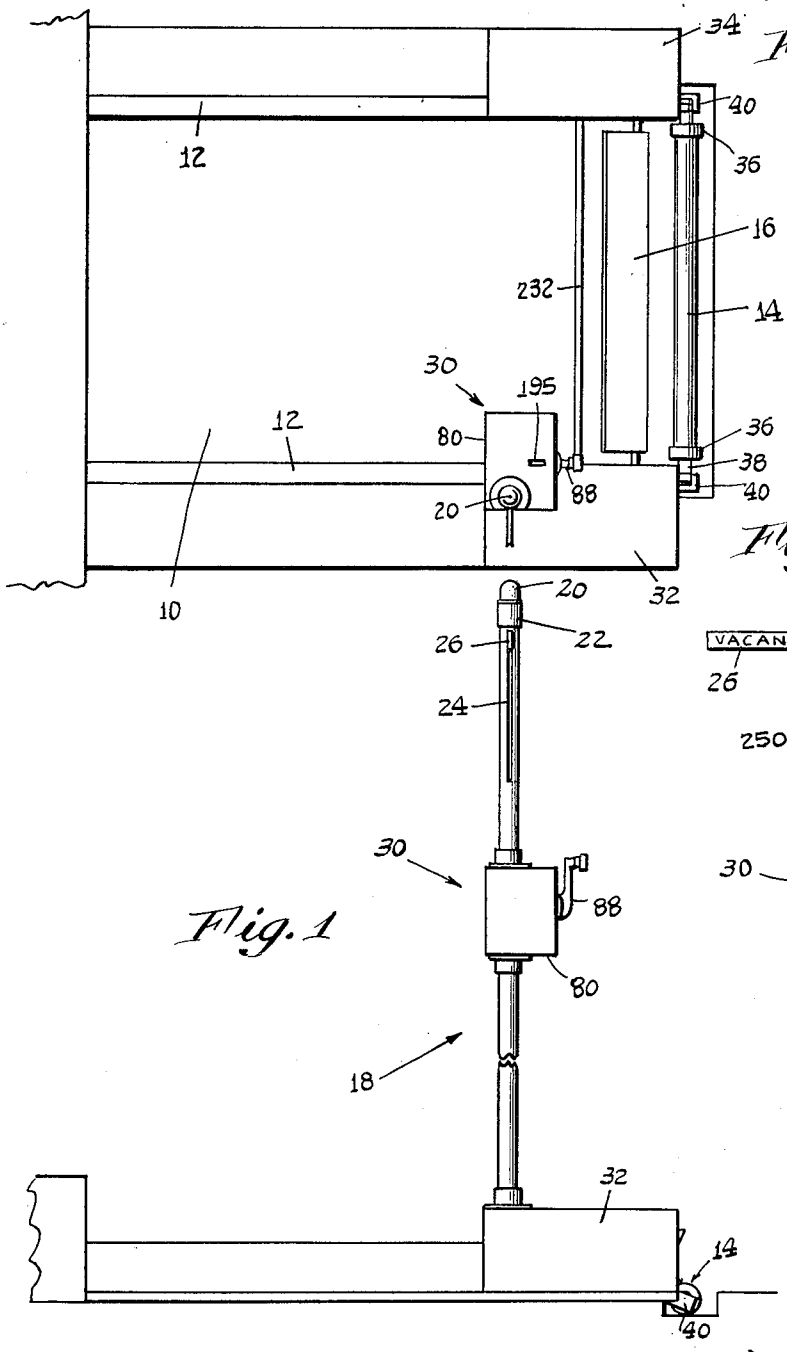

Fig. 2

Fig. 1

Fig. 3

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Fig. 4

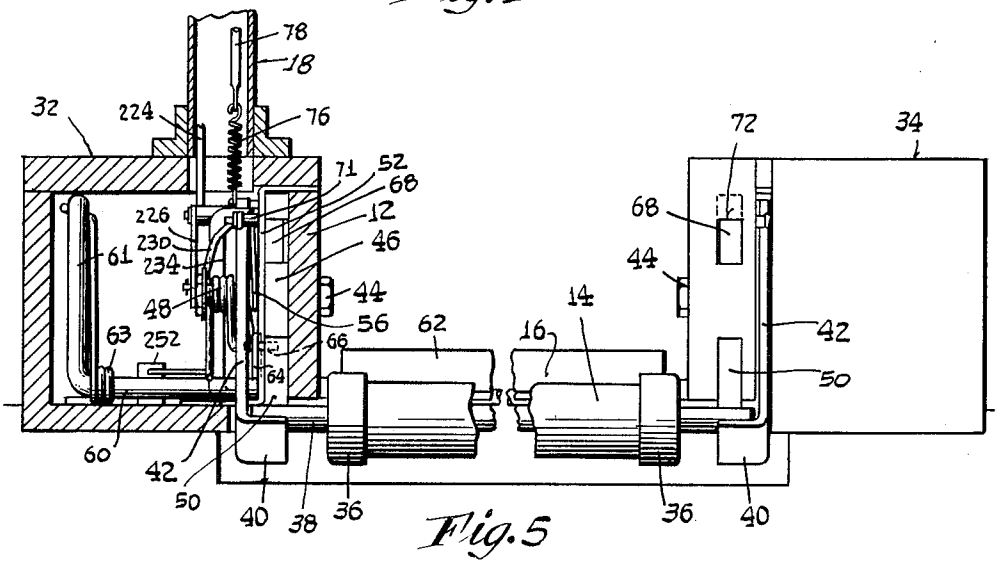
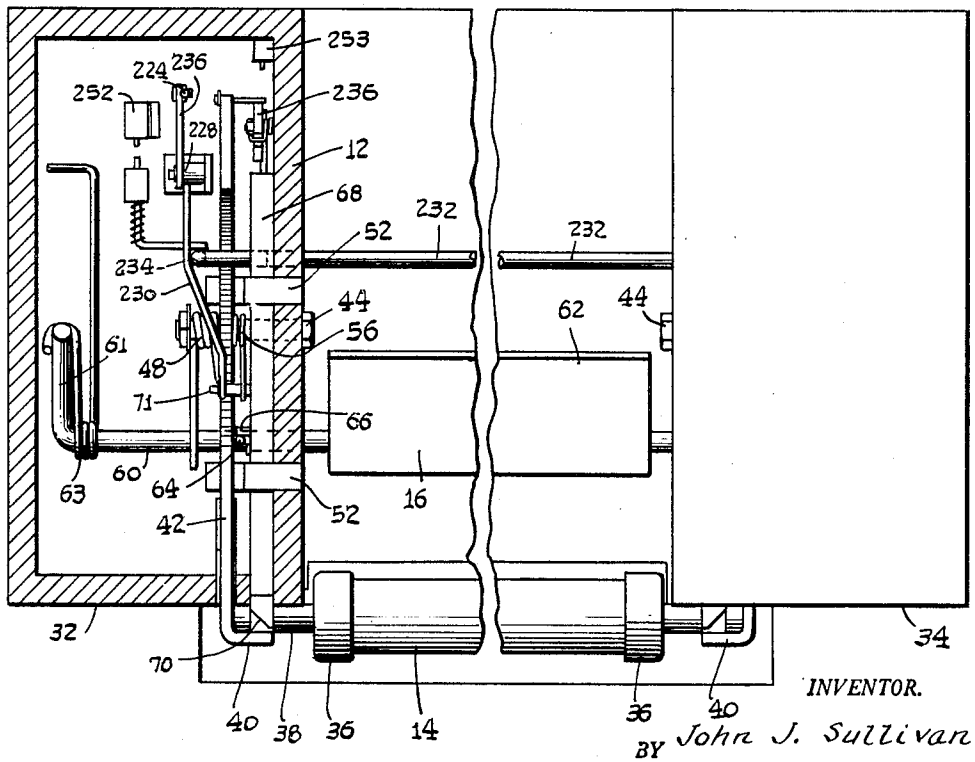


Fig. 5



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MECHANICAL PARKING ATTENDANT

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Fig. 6

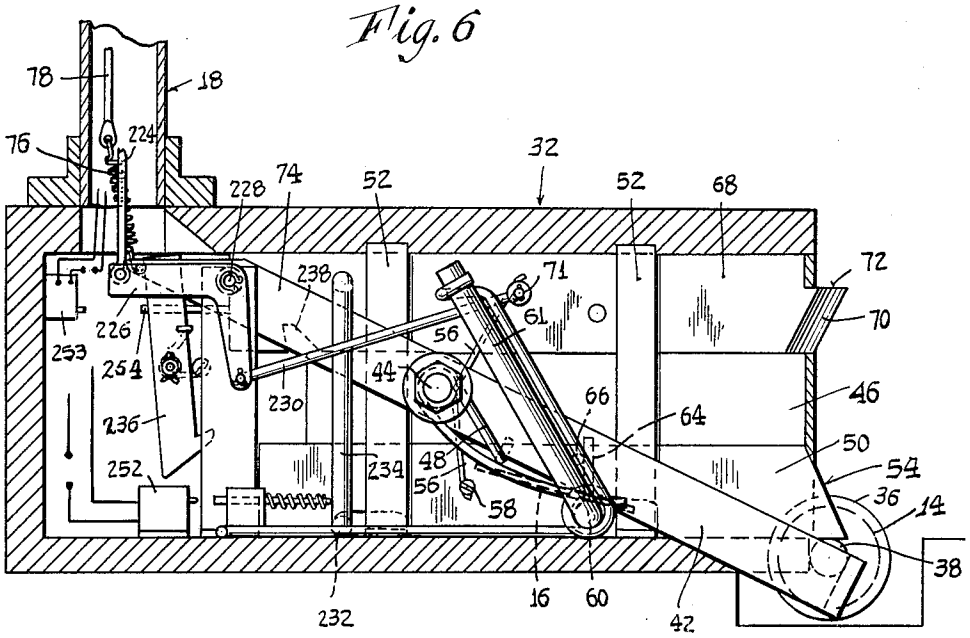

Fig. 7

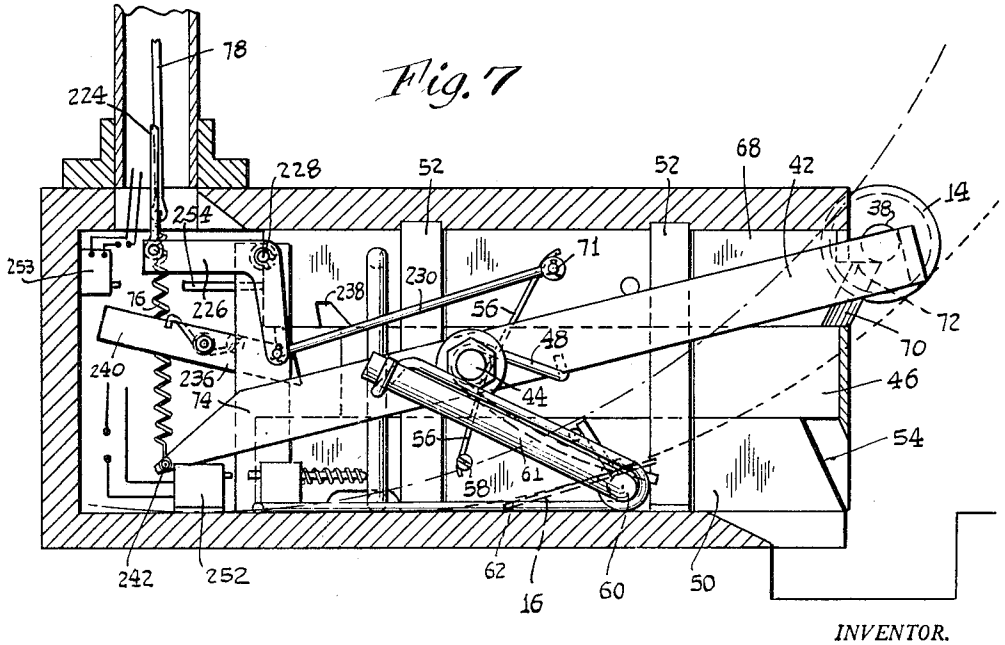

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Fig. 9

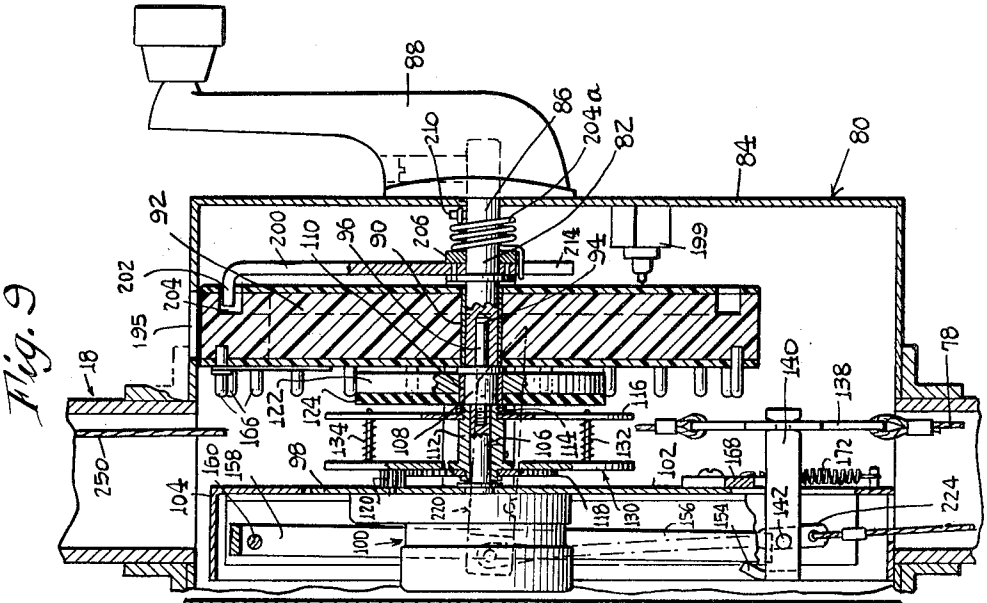

Fig. 8

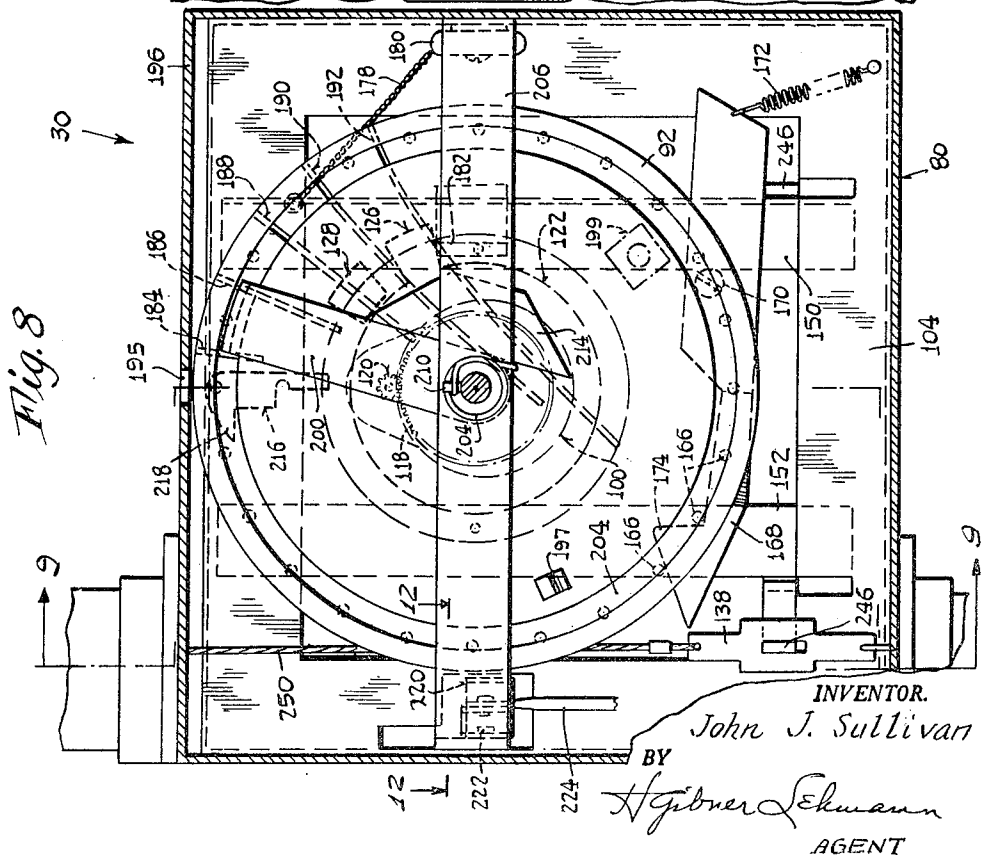

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Fig. 10

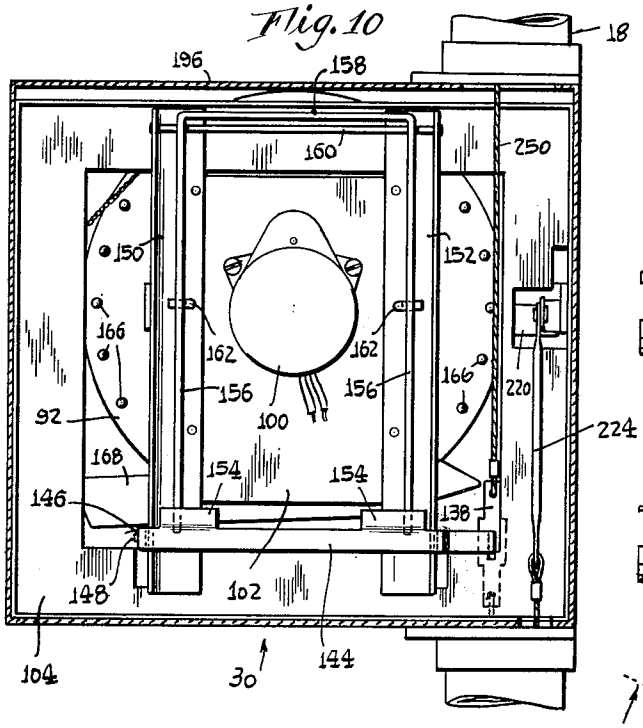


Fig. 12

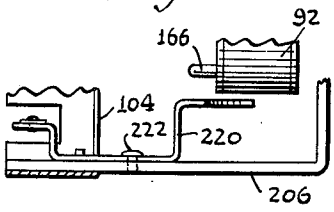


Fig. 13

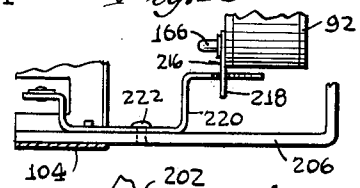


Fig. 14

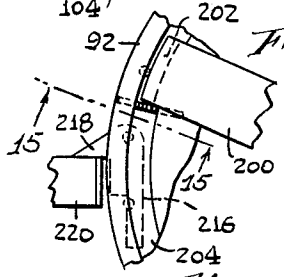


Fig. 11

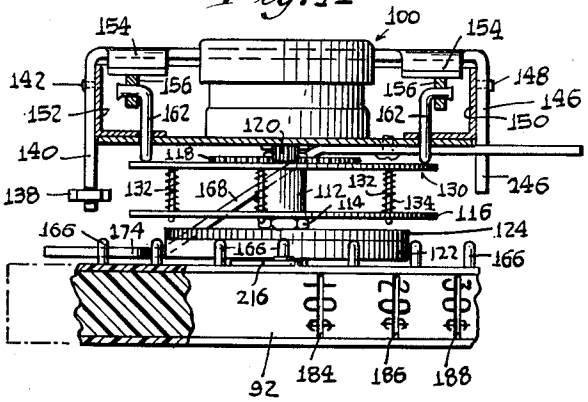
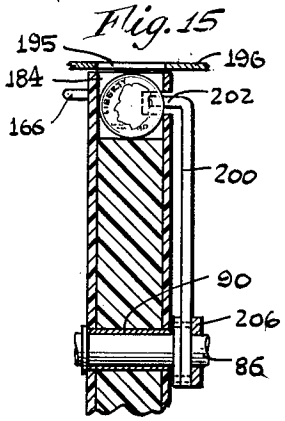


Fig. 15



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United States Patent Office 3,161,275 Patented Dec. 15, 1964

3,161,275

MECHANICAL PARKING ATTENDANT

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Filed May 17, 1960, Ser. No. 29,709
21 Claims. (Cl. 194—84)

This invention relates to metered automobile parking, and more particularly to automatic parking meter devices of the type which physically detain or hold the parked cars and, upon payment of the required fee release the cars for departure, thereby constituting in effect "mechanical parking attendants."

An object of the invention is to provide a novel and improved parking meter device functioning as a mechanical parking attendant in that it detains the automobile in the parking area or space against unauthorized removal and releases the automobile for departure upon payment of the required coin, which device reliably automatically computes the parking charge in accordance with the time involved, and receives and utilizes the coin or coins as a condition to release of the car.

Another object of the invention is to provide, in a mechanical parking attendant device of the type outlined, a simple and fool-proof automatic car detaining or holding means, and one which is extremely sturdy and reliable in operation.

A further object of the invention is to provide, in a car-detaining type mechanical parking attendant, an effective and reliable release mechanism which is actuated in response to and after payment of the required fee, so as to free the car for departure.

Still another object of the invention is to provide a novel mechanical parking attendant in accordance with the foregoing, wherein the detention of the car does not require contact or engagement with the car chassis or body at any point.

Yet another object of the invention is to provide a novel and improved, simplified coin mechanism for a mechanical parking device, which mechanism is small and compact, and efficient in its operation while involving a minimum number of parts or components.

A still further object of the invention is to provide, in a mechanical parking device of the above type, a reliable and yet simple reset mechanism by which the device is reliably conditioned for receiving another car after the departure of the preceding car.

An additional object of the invention is to provide an automatic parking device or attendant as characterized, which is easy to understand and to operate, and which does not require any special skill or knowledge in its use.

A further object of the invention is to provide an improved semi-automatic coin mechanism for use in a mechanical parking device, wherein physical use of or contact with the coin is utilized to effect the release, thereby reducing the number of parts and minimizing the likelihood of malfunctioning of the device.

Yet another object of the invention is to provide an improved mechanical parking attendant having a reliable signal means, involving both a semaphore type and indicator-light type of signal.

A feature of the invention resides in the provision of an improved parking attendant device which involves relatively few parts, is uncomplicated in its construction, and economical to fabricate and manufacture.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification similar characters of reference are used wherever possible to designate like components throughout the several views, in which:

FIG. 1 is a side elevational view of the improved mechanical attendant or parking device for an automobile parking facility such as a parking lot or the like, as provided by the invention.

FIG. 2 is a top plan view of the device shown in FIG. 1.

FIG. 3 is a fragmentary front elevational view, showing the upper portion of the parking device of FIGS. 1 and 2.

FIG. 4 is a fragmentary vertical view of the lower portion of the parking device, partly in vertical section and partly in front elevation, illustrating the front wheel locking bar, the wheel release bar and various associated components.

FIG. 5 is a fragmentary view partly in horizontal section and partly in top plan, of the construction shown in FIG. 4.

FIG. 6 is a view partly in vertical section and partly in side elevation, of the parking device construction shown in FIGS. 4 and 5, the parts being shown in the "vacancy" positions, ready for occupancy by an automobile which is to be parked.

FIG. 7 is a view like FIG. 6, but showing the parking device in its locking or "occupied" position, as effected by occupancy by a parked automobile.

FIG. 8 is a fragmentary view partly in vertical section and partly in elevation, showing the automatic control and coin meter portion of the device, the various components being in the "vacancy" positions which exist prior to parking of an automobile at the device.

FIG. 9 is a vertical sectional view, taken on the line 9—9 of FIG. 8.

FIG. 10 is a rear view, partly in vertical section and partly in elevation, of the automatic control and coin meter portion of the parking apparatus shown in FIGS. 1, 3, 8 and 9.

FIG. 11 is a fragmentary view, partly in top plan and partly in horizontal section, of the control and meter portion of the apparatus shown in FIG. 10.

FIG. 12 is a fragmentary top view along the line 12—12 of FIG. 8, showing a reset lever of the control and meter portion, prior to being actuated to release a parked car.

FIG. 13 is a view like FIG. 12, showing the lever in the process of being actuated to release the parked car.

FIG. 14 is a fragmentary front elevational view of the reset lever and associated components of FIG. 13.

FIG. 15 is a fragmentary sectional view, taken on the line 15—15 of FIG. 14.

Referring first to FIGS. 1, 2 and 3, the present improved mechanical parking device or attendant shown therein comprises a generally flat, preferably rectangular base member 10 arranged to be supported on a floor or ground surface of a parking lot, parking building or other facility, said base member being sufficiently large to enable the front wheel of an automobile which is to be parked, to be run onto the member with appreciable clearance in all horizontal directions. As seen in FIGS. 1 and 2, the base member 10 may have side rails or guides 12 disposed in spaced, parallel relation, said guides being arranged for disposition on opposite sides of a front wheel which has been run onto the base member.

Along its front edge the base member 10 has wheel-locking and lock releasing or trip bars 14 and 16 respectively, said bars extending between the side rails 12 and at their ends being supported adjacent the said rails.

The mechanical parking device or attendant further comprises an upright post or stanchion 18 having at its upper extremity red-light and green-light bulbs or domes 20 and 22. Below the domes 20, 22 the stanchion 18 has a vertical slot 24 in which there is accommodated a signal arm 26 pivotally mounted by means of a pivot pin 28 and arranged to occupy an extended, horizontal position as shown in FIG. 3 or else a folded, inoperative posi-

tion wherein it occupies the slot 24 and is mostly concealed within the stanchion 18. The signal arm 26 may have any suitable indicia thereon, as for example the word "vacancy" as illustrated in FIGURE 3. When the signal arm is extended as in FIG. 3, indicating that there is a vacancy at this particular parking berth, the light within the green bulb or dome 22 is preferably also energized, and when the signal arm 26 is folded downward and disposed within the stanchion 18 as a consequence of parking of a car, the light within the green bulb or dome 22 will be extinguished. The light within the red dome is energized in the interval starting from payment of the required fee at the termination of parking, and ending with departure of the car this being all accomplished by simple switch devices and circuits, the switch devices being automatically actuated by parts or components which are operated in response to release and departure of the vehicle, or parking of the vehicle.

Intermediate and upper and lower extremities of the stanchion 18 there is provided an automatic control and coin meter assemblage 30, said assemblage including an electric timing mechanism, coin receptacle and manual control means by which the mechanical attendant device may be actuated to receive the parking fee and to release the parked automobile so that the latter may be driven from the base member 10. Details of the assemblage 30 are given further along in the description of the device.

At both front corners of the base member 10 housings or enclosures 32 and 34 are provided, said housings being disposed at the outer sides of the rails 12 and enclosing mechanisms associated with the wheel locking bar 14 and lock release bar 16, and being also connected with the automatic control assemblage 30 and the signal arm 26.

Details of the mechanism disposed in the housing 32 are illustrated in FIGS. 4 through 7. The mechanism in the housing 34 is generally a duplicate for the most part, of the mechanism in the housing 32, and functions in a similar manner; accordingly, details of this duplicate mechanism are omitted in the present description, since the structures and functions are clearly duplications, and since the omission simplifies the drawings and descriptions set forth herein. Moreover, details of the components within the housing 34 are not necessary in order to understand and practice the invention.

Referring to FIGS. 4–7, the front wheel locking bar 14 is shown as being in the form of a roller or pipe section, having end fittings 36 by which there is accommodated a shaft 38, the latter at its ends being secured to inwardly bent extremities 40 of pivoted arms 42. As shown, the arms 42 are pivotally carried by bolts 44 which may be secured to the side rail structures comprising the rails or guides 12. The pivoted arms 42 are spaced outwardly from the rails 12 by suitable spacer means or bars 46 and springs 56 carried by the bolts 44, the said spacer bars extending along the outer sides of the rails 12 and being horizontally disposed, and a coil spring 48 on each of the bolts, engaging the pivoted arms 42 and the trip bar 16 biases the pivoted arms 42 counterclockwise as viewed in FIGS. 6 and 7.

The pivoted arms 42 are locked in lowered positions against the action of the coil springs 48, as seen in FIG. 6, by a pair of lower locking slides 50 which are guided within the housings 32 and 34 between the side rails 12 and Z-shaped brackets 52 disposed within the housings.

As seen in FIG. 6, the lower locking slides 50 have sloping front edges 54 functioning as camming edges, and the slides are spring urged to forward or extended positions, as in this figure, by coil springs 56 carried by the pivot bolts 44 and engaging pins 58 on the slides. With such construction the lower locking slides 50 may be shifted to retracted, releasing positions against the action of the springs 56, such positions being shown in FIG. 7 and effecting a release of the wheel locking bar 14 whereby the latter may be snapped upward by the pivoted arms 42 under the action of the arm springs 48.

The retraction of the lower locking slides 50 to release the wheel locking bar 14 for its raising, locking movement is effected automatically by the present invention, by actuation of the lock release or trip bar 16 as the latter experiences the weight of the vehicle and is engaged by the front vehicle wheel during driving of the vehicle onto the base member 10.

Referring to FIG. 7, the force of the vehicle wheel on the trip bar 16 will cause the latter to swing counterclockwise about an axis defined by a spindle or shaft 60 on which a plate portion 62 of the trip bar is eccentrically mounted, and to which it is rigidly attached.

As seen in FIGS. 4–7, the shaft 60 has an upward extension 61 engaged by one end of a coil spring 63 the other end of which extends along the bottom of the housing 32, thereby to bias the trip bar 16 in a clockwise direction. The trip bar 16 comprising the plate 62 and the shaft 60 has drive means comprising upstanding pins 64 engageable with actuator pins or lugs 66 carried by the lower locking slides 50. Considering FIGS. 6 and 7, upon counterclockwise turning movement of the trip bar 16 as effected by the vehicle wheel passing over such bar, the upstanding pins 64 will engage and drive ahead of them the actuator pins 66 carried by the lower locking slides 50, thereby to effect a retraction of the said slides to the position shown in FIG. 7. Thus, the effect of traversal of the front portion of the base member 10 by the front wheel of the vehicle will be the automatic operation of the wheel locking bar 14, whereby it will snap upward under the action of the coil springs 48. Thus, the raised position of the wheel locking bar 14 will be effected, see FIG. 7, after the front wheel of the vehicle has been driven onto the base member 10.

By the present invention, the wheel locking bar 14 after having been snapped upward to its locking position, is automatically securely held in the said position until intentionally released in response to payment of the proper parking fee, by insertion of said fee in, and actuation of the automatic control and coin meter assemblage 30. The automatic retention of the wheel locking bar 14 in the raised position is effected by a latch means comprising two upper locking slides 68 respectively disposed in the housings 32 and 34. The upper locking slides 68 are disposed against the side rails 12, as in the case of the lower locking slides 50, and are also retained in position by the Z-shaped brackets 52. The locking slides 68 have front sloping camming edges 70, and further have locking ledges or shoulders 72 disposed above the camming edges 70 and arranged to engage the underside of the shaft 38 which constitutes part of the wheel locking bar 14. As seen in FIGS. 6 and 7, the upper locking slides 68 are spring-urged to the forward or extended position shown in FIG. 6 by the same coil springs 56 (on the pivot bolts 44) which urge forwardly the lower locking slides 50. For this purpose, pins 71 are carried by the upper locking slides 68 for engagement with upwardly extending end portions of the springs 56, the downwardly extending end portions of said springs engaging the pins 58 as already stated above.

It will be understood that when the wheel locking bar 14 is snapped upward under the action of the springs 48, the shaft 38 of the bar will strike the camming edges 70 of the locking slides 68, effecting a retraction of the said slides against the action of the springs 56, whereby the shaft 38 will move past the camming edges and be engaged by the locking ledges 72 upon the freed slides 68 again shifting forward under the action of the springs 56. The lower locking slides 50 are confined by and engage the spacer bars 46, as seen in FIGS. 4, 6 and 7. The upper locking slides 68 rest on and are guided by the spacer bars 46, as seen in these figures.

It will be understood that, by the above organization, the wheel locking bar 14 when in its raised position and locked therein by the upper locking slides 68, will be securely retained and held against unintentional downward

movement, and the raised position of this bar will constitute an obstruction at the rear of the front vehicle wheel, thereby effectively locking the vehicle in its parked position. When it is desired to release the vehicle for departure from the parking device it is only necessary to effect a retraction of the upper locking slides 68, as by shifting said slides from right to left considering FIGS. 6 and 7, in order to release the wheel locking bar 14. Upon such release, the driving of the vehicle from the base member 10 will result in the front vehicle wheel forcing downward and passing over the wheel locking bar 14. Such action will cause the shaft 38 of the locking bar to engage the camimng edges 54 of the lower locking slides 50 and to shift the latter from right to left as seen in FIGS 6 and 7. Upon the shaft 38 passing downward below the camming edges 54, the lower locking slides 50 will again be shifted to the extended position of FIG. 6, locking the bar 14 in its lowered position.

By the present invention, the driving of the vehicle wheel onto the base member 10 not only effects an automatic locking of the vehicle by virtue of the wheel locking bar 14 snapping upward and being positively detained in the raised locking position of FIG. 7, but also effects an automatic starting of a metering and coin receptacle mechanism in the assemblage 30, this marking the commencement of the parking interval. This is accomplished by an extension 74 on the pivoted arm 42 shown in FIGS. 6 and 7, the said extension 74 being connected with an extension coil spring 76 which is in turn connected to a vertical link 78 passing upward through the post or stanchion 18, which latter is hollow for this purpose.

When the wheel locking bar 14 is in its lowered position as shown in FIG. 6, the vertical link 78 is in a raised position, and when the locking bar 14 is in its raised position as seen in FIG. 7, the vertical link 78 is in a lowered position.

Considering now FIGS. 8, 9 and 10 showing the automatic control and coin meter assemblage 30, this comprises a housing or case 80 have a centrally disposed main shaft assemblage 82, said assemblage comprising a compound spindle constituted of a number of separate and independently movable components, as follows: Passing through a central opening in the front wall 84 of the case 80 is a short shaft 86 having rigidly secured to its exterior end an operating handle 88. Within the case 80 of the shaft 86 rotatably bears in a bushing 90 on which there is carried a movable computer member in the form of a coin wheel 92. The shaft 86 has an axial bore 94 at its inner end, which receives a projecting pin 96 of a rigid composite stud fixedly mounted on a wall 98 of a synchronous electric timing motor and gear reduction unit constituting a power means 100 carried by a partition plate 102 mounted on a rectangular framework 104 disposed within the case 80. The rigid composite stud comprises a post 106 rigidly affixed to the wall 98 and having a threaded axial bore in which there is received and screwed the threaded end of the projecting pin 96. On the threaded pin 96 there is a cylindrical flanged body 108 which rotatably carries a collar 110. The collar 110 is spaced from the bushing 90 by the flange of the cylindrical body 108 of the composite stud. By such construction, the shaft 86 is turnably mounted in the case 80, being supported by the front case wall 84, and by the projecting pin 96 of the composite stud structure comprising the post 106 and the cylindrical body 108. The coin wheel 92 is also turnable with respect to the shaft 86, as will be understood.

Turnably mounted on the composite stud structure is a hollow driving shaft having aligned tubular parts 112 and 114, said parts being threadedly secured together as shown in FIG. 9 and fixedly carrying a driving member 116. The hollow driving shaft 112, 114 has rigidly affixed to it a gear 118 which meshes with a pinion 120 driven, through gearing not shown, by the synchronous electric timing motor and gear reduction unit 100. The hollow driving shaft having the aligned tubular parts 112, 114 is turnable about the rigid composite stud 106, 108, 96, and accordingly operation of the timing motor unit 100 will effect a full rotation of the driving member 116. Adjoining the driving member 116 and between the latter and the coin wheel 92 there is provided, rotatably mounted on the flanged body 108 a wheel driving disc or spider 122 having a resilient facing 124 of rubber or rubber-like material. The wheel driving disc 122 has a driving lug 126 (FIG. 8) which is engageable with a cooperable driving lug 128 carried by the coin wheel 92. Thus, a uni-directional drive may be readily established between the wheel driving disc 122 and the coin wheel 92 after there has been effected a slight extent of counterclockwise turning of the driving disc 122 as seen in FIG. 8, which brings the driving lugs 126 and 128 into engagement with each other.

By the present invention, a releasible drive is established between the timing unit 100 and the coin wheel 92 through the medium of the pinion 120, gear 118, driving shaft parts 112, 114 and driving wheel 116 in conjunction with the wheel driving disc 122 having the facing 124. To establish such drive, there is provided a clutch wheel 130 which is turnably carried on the driving shaft part 112 and has a plurality of driving pins 132 rigid therewith, carrying compression springs 134, the said pins extending through aligned apertures in the driving wheel 116 and being engageable with the resilent facing 124 of the driving disc 122 when the clutch wheel 130 is shifted to the right from the position shown in FIG. 9, thereby to project to a greater extent the driving pins 132 through the driving wheel 116.

It will be understood that the clutch wheel 130 is carried on the hollow driving shaft by virtue of the positioning of the driving pins 132 by the driving wheel 116. The springs 134 tend to maintain the clutch wheel 130 in engagement with the gear 118, whereby the driving pins 132 are out of engagement with the resilient clutch facing 124 of the wheel driving disc 122. Thus, normally the wheel 92 remains at rest, even though the synchronous timing unit 100 is continually energized and operated. For such condition, the driving wheel 116 and clutch wheel 130 will rotate at a very slow rate, but motion will not be imparted therefrom to the wheel driving disc 122 which has the one way driving connection with the coin wheel 92. However, such driving connection will be effected at the time that the front wheel of the vehicle is driven onto the base member 10 over the trip bar 16 which effects the raising and locking movement of the wheel locking bar 14. It will be recalled that such raising movement of the wheel locking bar 14 results in downward movement of the vertical link 78 passing through the stanchion 18. Referring to FIGS. 8 and 9, the link 78 is joined to a connector strip 138 which has a pivotal driving connection with a lever 140 pivotally mounted on a pivot pin 142. The lever 140 constitutes part of a U-shaped clutch actuator member 144, FIG. 10, which has a pivoted arm 146 carried by a pivot 148. The pivots 142 and 148 are mounted on L-section frame members 150 and 152 which are secured to the rectangular framework 104 within the case 80. The clutch actuator member 144 has upwardly extending lugs 154 which are engageable with the lower extremities of depending legs 156 of an inverted U-shaped clutch actuator 158. The clutch actuator 158 is carried by a spindle 160 which has a bearing in the frame members 150, 152. Intermediate their ends the depending legs 156 are engageable with push rods 162 which are longitudinally shiftable and extend in directions parallel to the main shaft assemblage 82. The push rods 162 pass through the L-section frame members 150, 152, and through the partition plate 102, having a bearing in each of these. The push rods 162 at their inner ends are arranged to engage the clutch wheel 130, and upon said rods being longitudinally shifted, they will move the clutch wheel 130 to the

right, as viewed in FIG. 9, whereupon driving engagement will be established between the timing motor unit 100 and the coin wheel 92. This longitudinal clutch-engaging shifting movement of the push rods 162 is effected in response to downward movement of the vertical link 78 from the position of FIG. 6 to the position of FIG. 7. Such downward movement will swing the lever 140 clockwise as viewed in FIG. 9, effecting a counterclockwise swinging of the clutch actuator 158 whereupon the latter will shift inward the push rods 162, such inward movement being from left to right considering FIG. 9 or into the paper considering FIG. 10. In consequence of the foregoing, the parking of the automobile will initiate a slow movement of the coin wheel 92, such movement being counterclockwise as viewed in FIG. 8.

As seen in FIGS. 8 and 9, the coin wheel 92 has a plurality of equi-spaced detent pins 166 disposed around its periphery and extending axially from the rear of the wheel. The detent pins 166 are engageable and cooperable with a spring-charged detent arm 168 carried by a pivot pin 170 and biased in a clockwise direction by a helical extension spring 172. The detent arm 168 has a camming nose portion 174 which is engageable with the detent pins 166 and has the effect of holding the coin wheel 92 in any of a number of consecutive, distinct positions each related by a given angular distance. FIGURE 8 indicates the starting position for the coin wheel 92, and for such position the driving lugs 126 and 128 are shown as separated a slight extent.

Upon the clutch of the mechanism becoming engaged as explained above, the wheel driving disc 122 will advance counterclockwise (with the coin wheel 92 remaining stationary and motionless) until the lugs 126 and 128 become engaged. Upon this occurring, the driving disc 122 will "pick up" the coin wheel 92 and effect a counterclockwise turning movement of the latter, considering FIG. 8. When any one of the detent pins 166 passes the point of the nose portion 174 of the detent arm 168, the action of the latter will be to suddenly and quickly advance the coin wheel 92 ahead of the wheel driving disc 122 until the next discrete angular position is attained, as controlled by the detent arm 168.

The wheel driving disc 122 will continue its slow driving movement, and will again bring into engagement the driving lugs 126 and 128. Thereafter the coin wheel 92 will again be driven slowly counterclockwise until the next detent pin 166 has passed the sharp point of the nose portion 174 of the detent arm 168. The coin wheel 92 will again be suddenly quickly moved to its next discrete position, and so on.

A light spring means, comprising a chain 178 connected to the periphery of the coin wheel 92 and a spiral-spring driven wheel 180 which gently pulls on the chain 178, biases the coin wheel 92 in a clockwise direction as seen in FIG. 8. This biasing action is only sufficient to return the coin wheel 92 to its starting position as shown in FIG. 8 upon the said wheel being wholly freed of the retarding influence of the detent arm 168 and the driving influence of the driving disc 122 and driving clutch assemblage above described.

It will be understood that upon release of the clutch, and when the detent arm 168 is removed from engagement with the detent pins 166, the coin wheel 92 will be returned and will drive ahead of it the driving disc 122 by virtue of the one-way driving connection between the lugs 126, 128. A stationary stop 182 may be arranged in the case 80, for engagement with the driving lug 126 to limit the return movement of the wheel driving disc 122, see FIG. 8.

In accordance with the present invention, the coin wheel 92 has a plurality of coin slots 184, 186, 188, 190 and 192 disposed in its outer periphery and extending generally radially inward into the wheel. The slots 184–192 are all of different lengths, and are arranged so that each succeeding slot will hold one more coin than the preceding slot. Thus, the coin slot 184 may hold one dime, the slot 186 two dimes, the slot 188 three dimes, etc. The coin slots 184–192 are consecutively presented to a coin window or opening 195 provided in the top wall 196 of the case 80. Also, the coin slots 184–192 are spaced apart the same distance as the detent pins 166, and the detent arm 168 is so positioned that with relation to the size of the coin window 194 there will always be positioned in said window one coin slot, readily accessible for receiving coins, for the various discrete angular positions of the coin wheel 92 with the exception of the initial or starting position of the coin wheel as seen in FIG. 8.

Accordingly it will now be understood that with the above construction, as soon as an automobile is driven onto the base 10, the coin wheel 92 will be started turning with a stepped advancing movement whereby the coin slots 184–192 may be consecutively presented at the coin window 194. The coin wheel 92 has a cam 197 which opens a switch 199 in series with the timing unit 100 to halt the latter when the last slot 192 is brought to the window 194. Thus, the unit 100 never advances the wheel 92 past this point.

In accordance with the invention, the presence of coins in any one of the coin slots 184–192 to the extent where the slot is completely filled, is utilized to enable the car owner or user of the parking device to actuate the control mechanism, by manipulation of the operating handle 88, in order to effect a release of the automobile by causing a retraction of the upper locking slides 68 so as to free the wheel locking bar 14. To accomplish this, the shaft 86 connected with the operating handle 88 is provided with a coin engageable driving arm 200 having an inwardly bent extremity 202 which is received in an annular slot or groove 204 provided in the front face of the coin wheel 92. The groove 204 is so arranged that the outermost coin in any of the slots 186–192 will project into the groove 204, as well as the single coin in the slot 184. The coin engageable driving arm 200 has a rigid driving connection with the operating handle 88, and said arm and handle are returned to a starting position as shown in FIG. 8 by virtue of the provision of a helical spring 204*a* connected at one end to a pin 210 on the shaft 86 and at the other end to a fixed bar 206 rigid in the case 80. In the starting position the driving arm is engaged and positioned by a stop member 214 rigid with the case 80. The stop member 214 limits the arcuate movement of the driving arm to virtually 180° from the position shown in FIG. 8, and for such counterclockwise rotated position, the coin slot carrying the coin with which the driving arm 200 is engaged will extend in a downward, coin discharging direction whereby the coin, when freed of any restraining influence from the driving arm 200 will drop into the bottom of the case 80.

Depending upon which coin slot 184–192 is presented at the coin window 195, the operator places the required number of coins, such as dimes, into the slot to completely fill it. The operator then turns the operating handle 88 counterclockwise as viewed in FIG. 8, whereupon the driving arm 200 will become engaged with the coin located at the periphery of the coin wheel 92, thereby effecting a driving connection between the arm and the coin wheel. Continued turning movement of the handle 88 will now enable the operator to turn the coin wheel 92 clockwise through approximately 180°, so as to bring the coin filled slot at the bottom of the wheel, thereby to enable the coins in the slot to fall out and be deposited in the case 80. Upon this occurring, the driving connection between the arm 200 and the wheel 92 no longer exists, and the wheel 92 will be returned to its initial or starting position shown in FIG. 8 under the action of the spring charged chain 178.

The above described turning movement of the coin wheel 92 by the operator is utilized to effect a release of the upper locking slides 68 and release of the wheel locking bar 14, in the following manner:

One of the detent pins 166 has and pivotally carries a driving dog 216 which is gravity controlled and has a projecting finger 218. Upon the coin wheel 92 making approximately a quarter of a revolution counterclockwise, the finger 218 will project to the left from the periphery of the wheel 92 as seen in FIG. 8. Such finger can thus engage one end of a lever 220 carried by a pivot 222, and can swing the lever clockwise as viewed in FIG. 9. The lever 220 at its other end is pivotally connected to a link 224 which extends downward through the stanchion 18 and is connected with a bell crank 226 carried by a pivot pin 228 within the housing 32. The bell crank 226 is connected by means of a link 230 with the pin 71 carried by the upper locking slide 68 shown in FIGS. 6 and 7.

The movement of the slide 68 shown in FIG. 6 is coordinated with the movement of the similar locking slide 68 in the housing 34 by means of a generally U-shaped tie bar 232 having upstanding pins 234 which are pivotally connected to these upper locking slides. The tie bar 232 bears on the base member 10, and when the said bar swing counterclockwise as viewed in FIGS. 6 and 7, it effects simultaneous retracting movement of the two upper locking slides 68 (from right to left).

From the foregoing it will be seen that upon the coin wheel 92 being actuated in response to turning of the operating handle 88 after deposit of the necessary amount of coins in the proper coin slot 184–192 the driving dog 216 will actuate the lever 220 and link 224, the latter in turn operating the bell crank 226 and through the link 230 the upper locking slide 68 shown in FIGS. 6 and 7 to retract the same. Retracting movement of such slide will effect a corresponding simultaneous retracting movement of the remaining upper locking slide 68, whereupon release of the wheel locking bar 14 is effected.

The invention further provides a latch member in the form of a latching detent or hook 236 which is pivotally mounted in the housing 32 and is receivable in a cooperable locking notch 238 of the upper slide 68, to retain the two slides in their fully retracted positions as effected by the link 230. The locking detent hook 236 is spring biased counterclockwise as viewed in FIGS. 6 and 7, and as seen in FIG. 7 is in readiness for entering the notch 238 upon the locking slide 68 being fully withdrawn from right to left by the link 230. The detent hook 236 has a rear extension 240 which is engageable by a pin 242 on the rear extension 74 of the pivoted arm 42 at the time that the arm is swung clockwise in response to departure of the automobile from the parking device. As seen in FIG. 6, the return of the wheel locking bar 14 and the pivoted arm 42 to their initial (vacancy) positions also effects a clockwise movement of the detent hook 236 to an inoperative position whereupon the upper locking slides 68 are free to be again extended under the action of the coil springs 56.

It will be noted that after the driving dog 216 has tripped the lever 220, the dog will move past the said lever upon continued turning movement of the coin wheel 92 as effected by actuation of the operating handle 88. When the full extent of movement of the coin wheel is realized, through approximately 180°, the coins will be positioned in readiness for their discharge from the slot. The return of the coin wheel 92 to its initial starting position under the action of the chain 178 will not be hampered by the presence of the driving dog 216, inasmuch as such dog is loosely pivotally mounted and influenced wholly by gravity. Upon the driving dog, during the return of the coin wheel 92 to its starting position, striking the lever 220 the sloping edge of the finger 218 of the dog will have a camming action which will cause the dog to pivot counterclockwise whereby it will swing out of the path and way of the lever 220. Thus, the driving dog 216 may bypass the lever 220 upon the return of the coin wheel 92.

After the operator has completed the counterclockwise turning movement of the handle 88 and effected release of the vehicle in the above described manner, he releases his grasp upon the handle whereupon the latter will be returned to its initial starting position under the action of the spring 204*a*. Disengagement of the driving arm 200 from the coin it has engaged will free this coin and any others so that it or they may now fall out of the slot in the coin wheel 92. The coin wheel is still retained in its counterclockwise rotated position by the detent arm 168. When the vehicle is driven off the base member 10, the return of the wheel locking bar 14 to its lower position as seen in FIG. 6 permits the link 78 to shift upward again. This will cause a counterclockwise turning of the lever 140 as seen in FIG. 9, whereupon the driving clutch involving the pins 132 and clutch facing 124 will become disengaged. The said movement of the lever 140 and the accompanying movement of the clutch actuator member 144 is utilized to disengage the detent arm 168 from the detent pins 166 of the coin wheel 92. Such disengaging movement of the detent arm 168 is accomplished by an extension 246 provided on the arm 146 of the actuator member 144. As seen in FIG. 8, the extension 246 upon experiencing upward movement in response to upward movement of the link 78, will effect a counterclockwise turning movement of the detent 168, whereupon the nose portion 174 becomes disengaged from the detent pins 166. When this occurs, the coin wheel 92 (with the clutch disengaged as above described) is free to return to its starting position under the action of the spring charged chain 178.

The raising and lowering movement of the vertical link 78 is utilized to actuate the vacancy signal arm 26 shown in FIGS. 1 and 3. Connected to the connector strip 138 is a link or cable 250, said link being pivotally connected with the signal arm 26 in such a manner that the arm is raised when the link 78 has raising movement, and is lowered when the link 78 is pulled downward in response to driving of an automobile onto the base member 10.

An electric switch device 252 is provided, arranged to be actuated in response to movement of the pivoted arm 42 shown in FIGS. 6 and 7. When the arm 42 is in the "vacancy" position of FIG. 6, the light within the green light globe 22 (FIG. 1) is energized. When the arm 42 is in the "occupied" position of FIG. 7, the light within the green globe 22 is extinguished. The light within the red light globe is energized by a switch 253 which is closed by a pin 254 on the upper locking slide 68 when the latter is in fully retracted position, as effected by the link 230 in response to turning of the coin wheel 92 by the operator, and prior to the parked car being driven off. Preferably, the light within the red light globe 20 has a flasher connected with it, so as to provide a flashing type signal, which will now indicate that a car is to leave the parking device.

The red blinker or flasher light constitutes an important safety factor. It provides a warning signal, from the time that the coin is deposited and the handle 88 turned to release the car, until the operator backs the car out. This latter operation depresses the locking bar 14 and effects a release of the upper locking slides 68 as a consequence, whereby the red flasher is extinguished. Accordingly, the red flashing light gives notice to an oncoming car that a parked car is about to leave the parking space.

In this connection it will be noted that the stanchion 18 with the signal light at its top is visible at all times throughout the entire parking area, both night and day. This is an important feature, since it is not possible at all times to ascertain the occupancy of all of the parking spaces or times of departure of the cars, especially in those instances where small foreign cars are intermixed with the higher and larger domestic cars. Accordingly, if the red and green signal lights were not provided atop the stanchion 18 it would be necessary for an operator to drive up and down the various aisles of a parking

facility in order to determine which spaces are available. However, with the red and green signals raised above the parked cars, the driver can go directly to any vacant space observed.

It will now be understood from the foregoing that I have provided a novel and improved mechanical parking atttendant having many desirable features and advantages. The device automatically locks a car which is parked, and releases the car upon payment of the required fee, which is computed automatically. The meter resets itself automatically upon departure of the car. However, whereas the timing is effected electrically and the computing of the fee is automatically done, the car is released by a manual act, through mechanical linkages and parts, thereby avoiding any holdup or delay which might otherwise be caused by a power failure. The present mechanical parking attendant is relatively simple in its construction considering the work and service performed, is sturdy to withstand the weight of the car, and reliable and foolproof in its operation at all times.

The operation of the present improved mechanical parking attendant as above constructed, will be briefly reviewed. Considering FIGS. 2 and 6 the driving of the front wheel of an automobile over the locking and trip bars **14**, **16** and onto the base **10** will swing the trip bar **16** counterclockwise as seen in FIGS. 6 and 7, shifting the slides **50** from right to left and releasing the locking bar **14**. This bar under the action of the springs **48** snaps upward, camming the slides **68** backward, and is locked in the raised position as the slides **68** are again extended under the bar **14**. Such action extinguishes the green light, pulls downward the link **78** and effects a clockwise turning of the lever **140** (FIG. 9) and a counterclockwise movement of the U-shaped clutch actuator **158**, driving inward the push rods **162** which shift the clutch wheel **130** to the right from the position of FIG. 9. The driving pins **132** engage the clutch facing **124** and couple the driving wheel **116** which is powered by the timing unit **100** to the driving disc **142**, which, through lugs **126** and **128**, has a driving connection with the coin wheel **92**. The coin wheel advances counterclockwise as seen in FIG. 8 presenting consecutively the coin slots **184–192** (by virtue of the stepped movement effected by the detent arms **163**) to the coin window **195**. When the car is to be released, the proper number of coins is placed in the slot presented, and the operating handle **88** is turned counterclockwise (FIG. 8) causing the driving arm **200** to engage the coin at the periphery of the coin wheel **92** and effecting a driving engagement between the handle and the coin wheel. Continued turning of the handle and coin wheel causes the driving dog **216** to trip the lever **220** clockwise as seen in FIG. 9, this causing the link **224** to be pulled upward, rotating the bell crank **226** clockwise and retracting the upper locking slides **68**. The red blinker light is now made operative. The driving of the car from the base member **10** depresses the wheel locking bar **14** whereby the latter is again latched in the lower position shown in FIG. 6 and the upper locking slides **68** released from the hooks **236** for advance. The red blinker light is extinguished and the green light energized again. The continued movement of the handle **88** and wheel **92** brings the coin slot to a lower downwardly inclined position, and upon release of the handle **88** and return of the same and the driving arm **200** to the starting position under the action of the spring **204***a* the coins will fall from the coin slot into a suitable receptacle provided in the case **80** under the coin wheel **92**.

Upon the wheel locking bar **14** being latched in the lowered position shown in FIG. 6, the raising movement of the vertical link **78** will effect a counterclockwise releasing movement of the detent arm **163** whereupon the coin wheel **92** will be free for return to its initial starting position under the action of the spring charged chain **178**. At the same time, the raising of the link **78** will release the clutch, whereupon the driving connection between the coin wheel **92** and the timing unit **100** is broken.

Variations and modifications may be made within the scope of the claims and portions of the improvement may be used without others.

I claim:

1. In a mechanical attendant for an automobile parking facility, in combination, a car-wheel engageable locking bar movable between raised locking and lowered unlocking positions, said bar normally occupying its lowered position wherein the car wheel is enabled to pass over it; a trip member separate from, movable independently of and disposed along-side said locking bar and movable upward and downward, said member being adapted to have the car wheel pass over it and to depress it after the wheel has first passed over the locking bar; and mechanical means including a spring power means continually biasing said locking bar to its raised, locking position and including a mechanical force-transmitting device engageable with the trip member and locking bar and actuated by downward movement of said trip member as the wheel depresses it, for effecting a shifting of said locking bar from its normal lowered position to the raised position wherein it constitutes a block for the car wheel.

2. The invention as defined in claim 1 in which there are slide latches for holding the locking bar in its lowered position, said latches constituting part of the mechanical means interconnecting the trip member and locking bar for effecting an upward shifting of the locking bar and said latches being drivingly connected to the trip member.

3. The invention as defined in claim 1 in which the trip member comprises a turnable horizontally disposed bar arranged parallel to the locking bar and tiltable about a fixed axis, said trip member having a wheel-engageable portion which is substantially vertically movable to effect tilting of the bar.

4. The invention as defined in claim 3 in which there are slide latches at both of the ends of the locking bar, for holding the same in its lowered position, said latches constituting part of the mechanical means interconnecting the trip member and locking bar, and in which the trip bar has drive means at both of its ends, engageable with the slide latches to actuate the latter.

5. The invention as defined in claim 1 in which there is a movable computer member, in which there are power means connected with the computer member and control means actuated by the locking bar in response to upward shifting of the latter, for rendering said power means operative to effect timed advancing movement of the computer member, in which there are releasable latch means cooperable with the locking bar for locking the same in raised position, in which there are coin-receptacle means rendered operative by advance of the computer member, for holding a coin, and in which there are means rendered operative by a coin in said coin-receptacle means and operatively connected with the computer member and latch means, for effecting release of said latch means whereby the locking bar may be returned to its lowered position to release the car for departure.

6. The invention as defined in claim 5 in which there is a semaphore signal and actuator means connected with the said control means, for actuating the semaphore signal in response to shifting of the locking bar.

7. The invention as defined in claim 5 in which there is an upright hollow stanchion disposed adjacent the locking bar, at the upper portion of which stanchion the computer member is carried, and in which the control means and the means for effecting release of the latch means comprise elongate links passing through the hollow stanchion.

8. The invention as defined in claim 5 in which the control means includes an extensible spring link connected with the locking bar, and includes a driving clutch for said computer member, controlled by said spring link.

9. The invention as defined in claim 5, in which the computer member comprises a coin wheel having the said coin-receptacle means in the form of slots in its periphery,

said slots being of graduated lengths and being adapted to receive a graduated series of coins, and in which the coin-controlled means comprises a movable drive member located adjacent the coin wheel and adapted to engage the outermost coin of any slot, thereby to effect a driving connection with the coin wheel.

10. The invention as defined in claim 9, in which the power means comprises a timer mechanism and in which the control means comprises a clutch for coupling said timer mechanism to the coin wheel to advance the latter.

11. The invention as defined in claim 1 in which there are means including a pair of slides for releasably locking the locking bar in its raised position, and in which there are release means including a coin receptacle, for retracting said slides to release the locking bar after a coin has been placed in said receptacle.

12. The invention as defined in claim 11 in which the slides are located at opposite ends of the locking bar and in which there is a turnable tie rod interconnecting said slides for simultaneous movements.

13. The invention as defined in claim 11 in which there is an electric switch means and a circuit controlled by the locking bar, and in which there is an electric lamp connected with said circuit and energized when the locking bar is lowered.

14. The invention as defined in claim 11, in which there is an electric switch means and a circuit controlled by one of said locking slides, and in which there is an electric lamp connected with said circuit and energized when the slide is retracted for release of the locking bar.

15. The invention as defined in claim 11, in which there are means including a latching detent member cooperable with one of the slides, for holding the slides in retracted position, said latching detent member being cooperable with the locking bar and being shifted to inoperative position when the bar is moved to its lowered position.

16. The invention as defined in claim 15 in which the coin receptacle comprises a wheel having slots for receiving coins, and in which the release means further comprises a manually operable arm engageable with a coin in the wheel, for effecting turning of the wheel, and comprises means to actuate the slides in response to turning of said wheel.

17. The invention as defined in claim 16 in which the means to actuate the slides in response to turning of the wheel includes a driving dog pivotally carried by the wheel and a linkage system connected with the slides and actuated by said dog as the wheel is turned.

18. In a mechanical attendant for an automobile parking facility, in combination, a timer mechanism; a coin wheel having slots spaced along its periphery and extending toward the wheel center from the periphery, said slots being of graduated depths and being adapted to receive a graduated series of coins; means providing a fixed coin-receiver slot adjacent the wheel periphery, whereby coins are guided for insertion in the slots of the wheel; a wheel-actuating arm movable along the wheel periphery past the said slots, said arm being engageable with the last of a series of coins filling any one slot, thereby to effect a driving connection between the arm and wheel and means actuated by a car wheel and including a clutch, for coupling said timer mechanism to the coin wheel to advance the latter for presenting said slots consecutively at the said coin receiver slot.

19. The invention as defined in claim 18 in which the said means actuated by a car wheel includes a locking bar which raises behind the car wheel and locks in raised position to lock the wheel against retrograde movement, and in which advance of the coin wheel to a foremost position releases the locking bar for lowering movement to release the car wheel.

20. In a mechanical attendant for an automobile parking facility, in combination, a timer mechanism; a coin wheel having slots spaced along its periphery and extending toward the wheel center from the periphery, said slots being of graduated depths and being adapted to receive a graduated series of coins; means providing a fixed coin-receiver slot adjacent the wheel periphery, whereby coins are guided for insertion in the slots of the wheel; a wheel-actuating arm movable along the wheel periphery past the said slots, said arm being engageable with the last of a series of coins filling any one slot, thereby to effect a driving connection between the arm and wheel and means actuated by a car wheel and including a clutch, for coupling said timer mechanism to the coin wheel to advance the latter for presenting said slots consecutively at the said coin receiver slot; and means responsive to the coin wheel attaining a predetermined advanced position, for rendering inoperative the timer mechanism.

21. In a mechanical attendant for an automobile parking facility, in combination, a car-wheel engageable locking bar movable between raised locking and lowered unlocking positions, said bar normally occupying its lowered position wherein the car wheel is enabled to pass over it; a trip member separate from and disposed along-side said locking bar and movable upward and downward, said member being adapted to have the car wheel pass over it and to depress it after the wheel has first passed over the locking bar; and means responsive to downward movement of said trip member as the wheel depresses it, for effecting a shifting of said locking bar from its normal lowered position to the raised position wherein it constitutes a block for the car wheel; means including a pair of slides for releasably locking the locking bar in its raised position; release means including a coin receptacle, for retracting said slide to release the locking bar after a coin has been placed in said receptacle; and slide bars having cam means for holding the locking bar in its lowered position, said bar being engageable with the cam means to retract the slide bars and bypass the latter when moving to its lowered position, said slide bars constituting part of the means for effecting an upward shifting of the locking bar and being operably connected to the trip member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,726,724	Warren	Sept. 3, 1929
2,015,607	Shinn	Sept. 24, 1935
2,147,520	Bullock	Feb. 14, 1935
2,328,858	Sweetland	Sept. 7, 1943
2,536,178	Haynie	Jan. 2, 1951
2,735,202	King	Feb. 21, 1956
2,805,498	Mosher	Sept. 10, 1957
2,913,906	Sinclair	Nov. 24, 1959

FOREIGN PATENTS

726,207	Great Britain	Mar. 16, 1955