

Sept. 17, 1940.

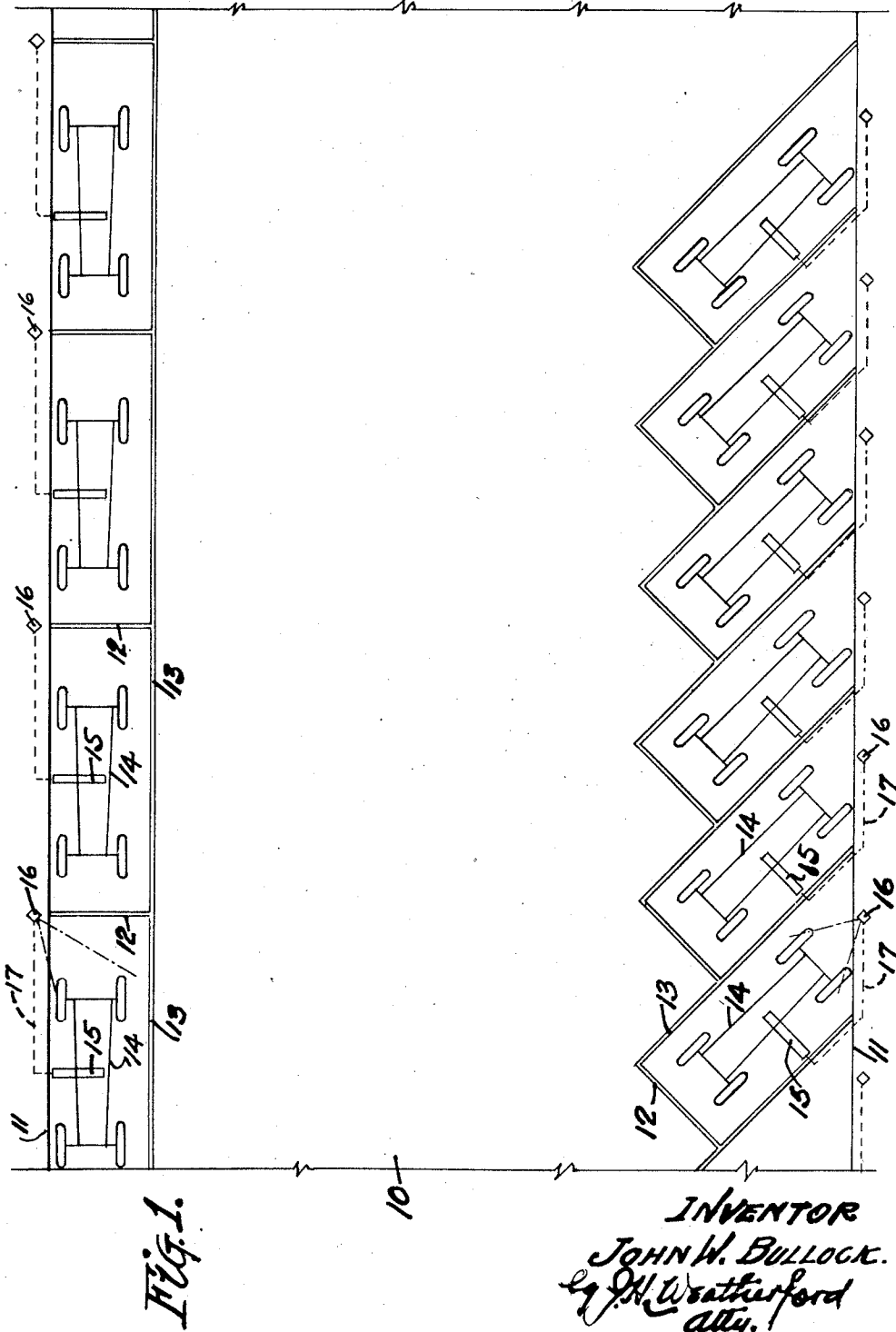
J. W. BULLOCK

2,214,829

PARKING REGULATOR

Filed Sept. 2, 1938

5 Sheets-Sheet 1



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5 Sheets-Sheet 2

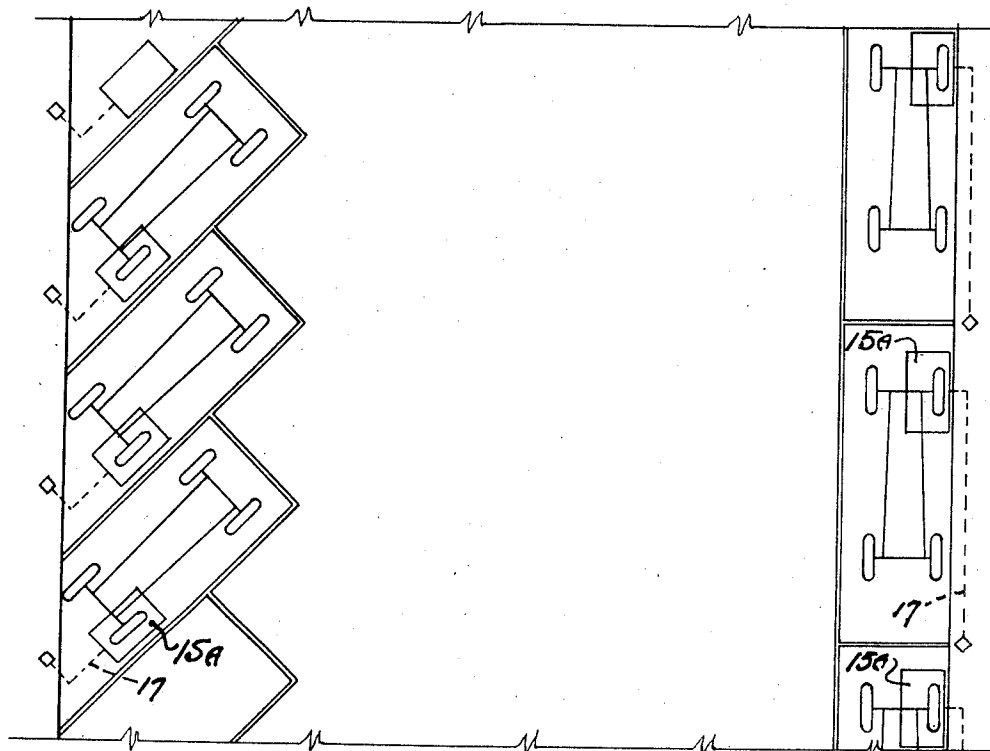


Fig. 2.

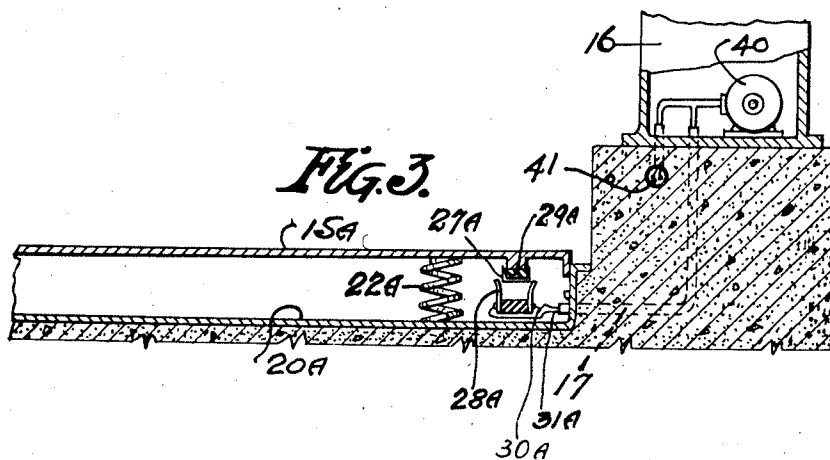


Fig. 3.

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5 Sheets-Sheet 3

FIG. 5

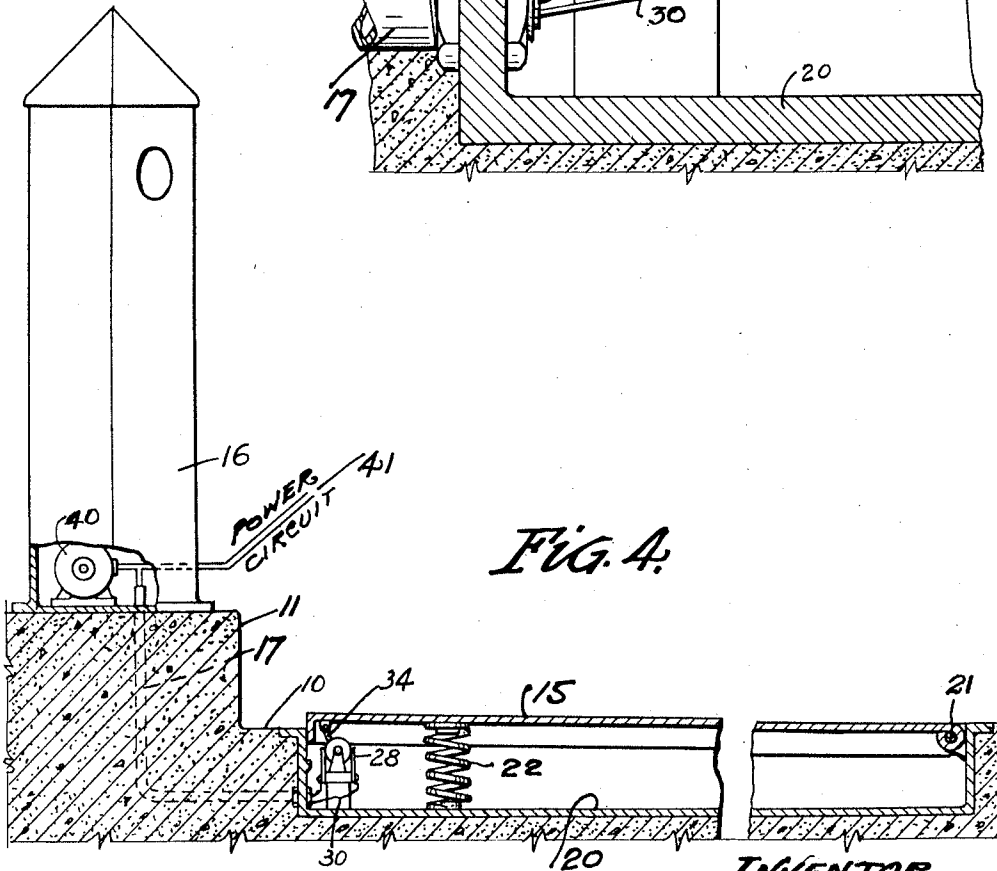
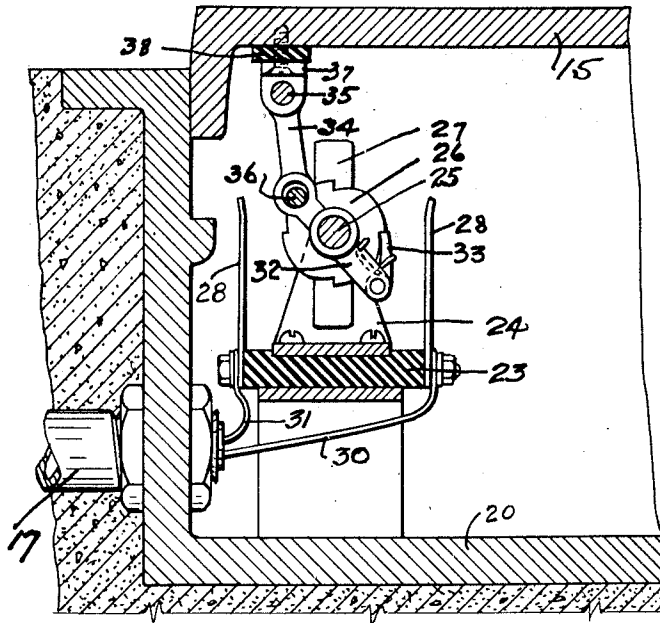


FIG. 4.

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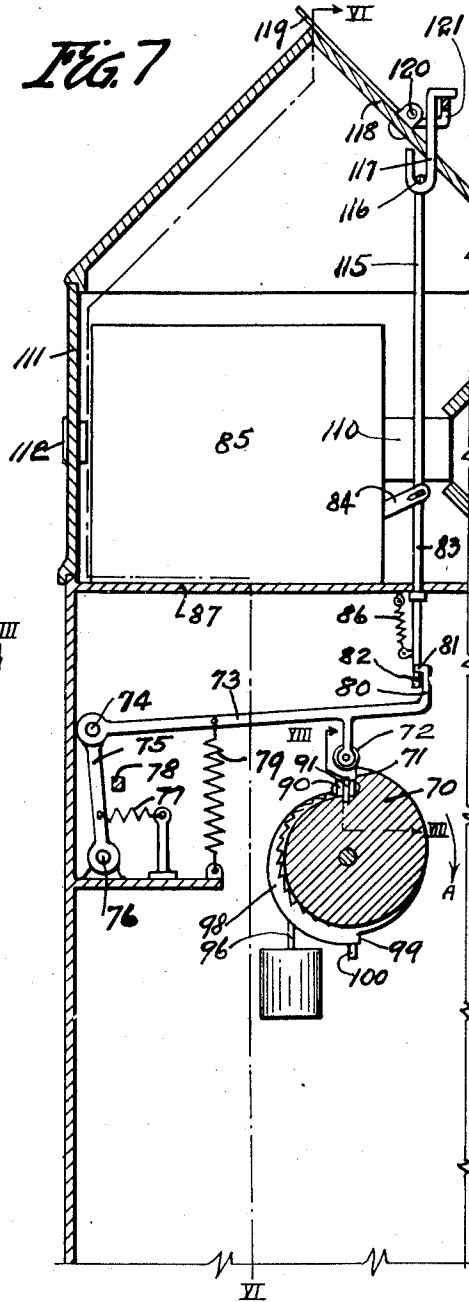
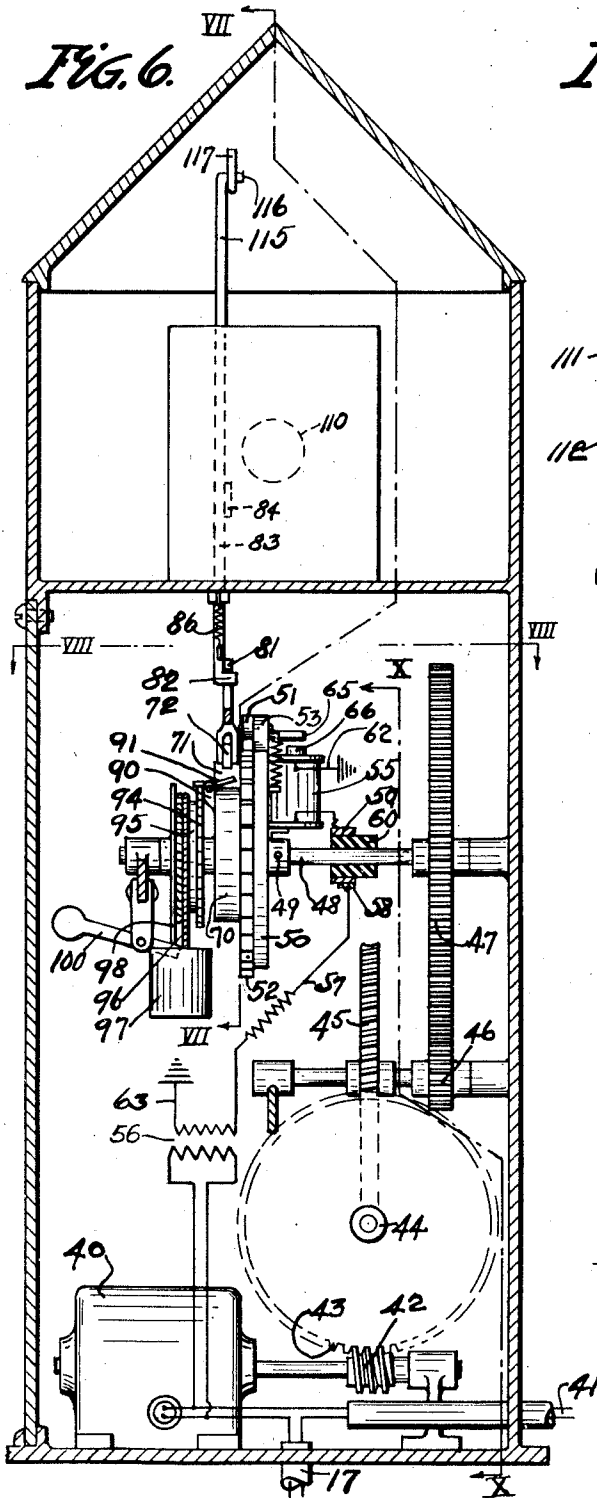
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5 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,214,829

PARKING REGULATOR

John W. Bullock, Miami, Fla.

Application September 2, 1938, Serial No. 228,138

8 Claims. (Cl. 161—15)

This invention relates to means for regulating parking of vehicles, particularly on city streets.

The problem of parking vehicles in congested districts of cities has reached an acute stage. Parking meters have been introduced in numerous cities in which payment is deposited to compensate for the use of a parking space for a predetermined length of time, these meters showing at the end of the predetermined period a visible sign which indicates that the vehicle has overstayed the predetermined time, but it is possible for one to return near the end of the period and by making an additional payment extend the time for an additional period, or even, unless checkup is made with great frequency, to over-stay the time and then make payment, extending the time for an additional period. Many additional complications arise in that a space is often used for a limited portion of the time paid for and thereafter the space is available for another person for the balance of the period. This in itself might not be objectionable except that it gives rise to the habit of shopping around for a space having an unused period, causing such slow-up of traffic as to cause in itself serious congestion.

In addition to this the laws of numerous States are such that the right to charge for parking is extremely questionable, although the right to prohibit parking for more than a limited time and to fine owners for the violation seems to be unquestioned.

The present invention therefore relates to means for recording and identifying a vehicle which has been parked for more than a predetermined period, and to means for further recording additional predetermined periods in which the vehicle remains in the space.

The objects of the present invention are:

To provide means for recording the license number of a parked automobile, as by photographing the same.

To provide means for operating a camera for such purposes.

To provide means operated by the positioning of a vehicle in a parking space for starting said operating means.

To provide means operated by exit of the vehicle from the parking space for restoring the operating mechanism to initial position.

To provide means for delaying operation of the camera for a predetermined period.

To provide means for delaying the operation of the camera for a predetermined period and after initial operation for operating the camera at predetermined successive intervals; and

To provide means for visually indicating that the vehicle has over-stayed the first said predetermined period of time.

The means by which the foregoing and other objects are accomplished, and the method of their accomplishment will readily be understood from the following specification on reference to the accompanying drawings in which:

Fig. 1 is a plan view of a short section of street in which parking is allowed, and is to be metered, one side of the street being shown as arranged for diagonal parking and the other side thereof for parking parallel with the curb, showing one positioning of control mechanism.

Fig. 2 is a similar plan view showing the positioning of an alternate type of control mechanism.

Fig. 3 is a sectional elevation showing the detail of the control mechanism used in such alternate form.

Fig. 4 is a sectional elevation showing the vehicle operated trip employed in the first type of control mechanism and the stand housing the remainder of the mechanism, a portion of this housing being broken away to indicate connection to an operating motor therein.

Fig. 5 is an enlarged detail of the switch of Fig. 4, operated by the trip mechanism of such view.

Fig. 6 is a sectional elevation of the stand showing the mechanism housed therein in elevation and showing the front of the camera.

Fig. 7 is a sectional elevation taken on the line VII—VII of Fig. 6 and at right angles thereto.

Fig. 8 is a sectional plan taken on the line VIII—VIII of Fig. 6.

Fig. 9 is an enlarged fragmentary detail showing the return drum release mechanism.

Fig. 10 is a fragmentary sectional elevation taken on the line X—X of Fig. 6.

Referring now to the drawings in which the various parts are indicated by numerals:

10 is the roadway portion of a street and 11 the curb lines. 12 and 13 are respectively markings outlining positions which individual automobiles 14 may occupy when parked on the street.

In Figs. 1, 4 and 5, 15 are plates disposed in the street surface in such position that one wheel of an automobile entering a parking space outlined by the marks 12 and 13 must pass over it, and that this wheel or another wheel of the vehicle must again pass over the plate in leaving the parking space.

16 are stands adapted to house certain operating mechanism, to be later described, and a 55

camera; and 17, shown dotted, indicate conduits for wiring connections, from mechanism underlying the plate 15, or 15—A as the case may be, to the stand 16.

- 5 In Figs. 2 and 3 a larger plate 15—A has been substituted for the plate 15, the larger plate 15—A being so positioned that when an automobile is parked within an area defined by the curb 11 and lines 12 and 13, one of the wheels must come to rest on such plate and there remain until the parking period ends.

- 10 The plate 15 forms the cover of a box 20, both preferably being made of metal, as cast iron. The top of the box is substantially flush with the roadway surface 10. The cover 15 is hinged as on a pin 21 adjacent one end of the box and is supported adjacent its opposite end as by a coil spring 22, this spring supporting the plate 15 above the street surface and being of such strength that 20 the weight as of the wheel of an automobile is necessary in order to depress it, being purposely made of sufficient strength that one or more persons standing thereon cannot trip it and thereby cause its unwanted operation. Within the box 25 is a switch adapted for operation by the depression of the plate 15. This switch preferably comprises a base of insulating material 23 which supports brackets 24 in which a shaft 25 is journaled.

- 30 Secured on this shaft is a ratchet wheel 26, preferably having four notches, and also secured on the shaft is a contact bar 27 which is adapted to bridge between fingers 28, and establish a circuit between lead wires 30, 31.

- Turnably mounted on the shaft 25 is an arm 32 35 which carries a pawl 33 which successively engages the notches of the ratchet 26. The arm 32 is connected by a link 34, pins 35 and 36, and a bracket 37 to the plate 15. The bracket 37 may be insulated from the plate by insulation 38. The 40 wires 30, 31 lead from the switch through the conduit 17 to a constant speed motor 40 within the stand 16. 41 is a power circuit leading to the motor, the circuit being closed and opened by the switch above described.

- 45 In the form of the device shown in Figs. 2 and 3, 27—A is a contact bar which is preferably insulated from the plate 15—A as by a block of insulation 29—A, the bar being directly depressed into engagement with the contact fingers 28—A, 50 establishing a circuit between the lead wires 30—A, 31—A when an automobile wheel rests on and depresses the plate 15—A. Such contact is made when the automobile enters the parking spaces and continues until the automobile leaves, 55 and the spring 22—A raise the plate and break the circuit. The wires 30—A, 31—A lead as before to the motor 40, the subsequent mechanism in both forms being identical.

- The motor 40 is geared through reducing gearing as a worm 42, worm wheel 43, second worm 60 44, worm wheel 45, pinion 46 and gear 47 to a shaft 48, suitably journaled, the reduction in the present case being so made that each complete turn of the shaft is accomplished in a predetermined period of time corresponding to the free 65 time parking interval allowed. Secured on the shaft 48, as by a pin 49, is a disc 50 which carries a dog 51 adapted to be engaged with a wheel having ratchet teeth 52. Preferably the disc 50 has 70 a protruding ear 53 to which the dog 51 is pivotally attached as by a pin 54. Also mounted on the disc 50 is an electro-magnet 55, which, when energized depresses the dog 51 into engagement with the ratchet teeth 52. 51—A is a spring acting 75 to disengage the dog when the magnet is deen-

energized. Current is fed to the magnet from the power circuit 41 through a transformer 56, one lead 57 from the secondary of the transformer being connected to a shoe 58 which contacts a sleeve 59, the sleeve 59 being carried by a hub 60 of insulating material mounted on and turning with the shaft 48. 61 is a lead from the sleeve 59 to the magnet 55, the opposite magnet lead 62 and transformer secondary lead 63 being grounded. The dog 51 has a laterally extending armature 65 10 overlying the core 66 of the magnet and being depressed by energization of the magnet to effect engagement of the dog 51 with the ratchet teeth 52.

The ratchet wheel 52 is secured to and turns 15 with a spiral cam 70 which has an abrupt drop 71. When the gear 52 is coupled by the dog 51 and is rotated by the motor, the cam 70 moves in the direction of the arrow A, Fig. 7. 72 is a roller resting on the face of the cam 70, this roller being 20 carried by an arm 73, one end of which is pivotally supported as by a pin 74, which pin in turn is carried by an oscillatable arm 75, this arm in turn being pivotally supported as by a pin 76. 77 is a tension spring, and 78 a stop limiting movement of the arm 75 under pull of the spring 77. 79 is a tension spring urging the arm 73 downward and holding the roller 72 in engagement with the face of the cam 70. The arm 73 has an upwardly extending 30 portion 80 having an inwardly turned lug 81 adapted for engagement with a complementary lug 82 which projects from a camera trip link 83, which link on depression trips the protruding lever 84 of the shutter of a camera 85. The link 83 is normally held in raised position by a tension 35 spring 86 which depends as from a transverse plate 87 which may serve as a support for the camera 85.

90 are ears projecting from the cam 70. 91 is a latch member pivotally supported as by a pin 40 92 (Fig. 9) carried by the ears 90, one end 91A of this latch member extending into the path of the roller 72 and being adapted to be depressed when the roller drops. 93 is a compression spring supporting this end of the latch member. The 45 opposite end 91—B of the latch member extends into the path of the teeth of the ratchet wheel 94, this wheel forming an integral part of a drum 95 which is journaled on the shaft 48. 96 is a cord or cable wrapped around the drum 95 and 50 having one end secured thereto, the opposite end of the cord being attached to a weight 97. The drum has a flanged end 98 which exteriorly spirals inward to an abrupt rise 99. This rise is engaged as the drum is reversely turned by a swing- 55 ing stop 100 which limits the drum movement to one substantially complete turn.

The camera 85 is an ordinary camera, using roll film and having a lens 110 of short focus and wide angle. The camera is provided with an 60 automatic spacer which advances an unexposed film section after each picture is taken. Access to the camera is had through a door 111 in the back side of the stand, this door being provided with a lock 112 preventing unauthorized access 65 thereto.

The link 83 may have an extension 115 which has a lug 116, adapted on depression of the rod to engage a slidable link 117, which projects upward through the top or roof 118 of the stand. 119 70 is a signal or flag having its lower end hinged as by a pin 120 to the roof surface. The flag 119 has a bell crank projection 121 which is engaged by the link 117 when the latter is depressed and which shifts the flag 119 into vertical position 75

where it remains until manually depressed. It will be noted that the depression of the rod 83 at the end of the first period raises the flag and no subsequent depression has effect thereon.

The installation comprises marking off on the street surface distinct lines, 12 and 13, outlining spaces in which automobiles may be parked and installing in each of these spaces, approximately at the mid point thereof, one of the boxes 20 including the actuating plates 15 by which these boxes have been designated in the street plan, or, alternately, the installation of boxes 20—A including their plates 15—A.

The stands 16 carrying the cameras 85 are then installed in such position that the lens 10 of the camera points toward the end of an automobile parked in the space outlined therefor. The motor and other mechanism within the stand and the switch within the box are connected up to a power line 41 which is ordinarily lead to the stands in usual manner through a conduit.

After the installation is made the doors 111 of the backs of the stands may be opened to provide access to the camera and the film rolls adapted for the desired maximum number of pictures are placed in the camera, it being presently supposed that the number of pictures to be taken should properly be either three or four and that the film provided should take care of such number of pictures only. One wheel of an automobile entering a parking space must necessarily cross the plate 15 depressing the plate and throwing the switch bar 27 into closed position between the contact fingers 28, energizing the motor 40 and the magnet 55, the energization of the magnet depressing the ratchet 51 into engagement with the ratchet wheel 52 and operatively connecting the motor through the gearing to the cam 70. At the same time the energization of the motor starts the motor and the timing period. Obviously a motorist entering the space may not properly position his car and may shift the car a number of times before he finally accomplishes proper position and in such shift may cross and recross the plate a number of times. Each such crossing of the plate obviously depresses the plate and alternately the motor is energized by each inward movement and deenergized by each outward movement but must come to rest, if properly parked, with the motor energized.

With the motor energized, the timing period progresses, the motor, through the gearing, turning the cam 70 and gradually raising the roller 72 and the arm 73 which carries said roller to bring the lug 81 upward into position to engage the camera trip lug 82. During this movement the spring 77 holds the arm 75 against the stop 78 with the lug 81 shifted out of the path of the lug 82 and free to move upward. Should the vehicle remain in the parking space in excess of the allotted time, the timing cam 70 reaches a point where the abrupt face 71 of the cam passes the center of the roller 72 and shortly thereafter the roller, urged downward by the spring 79, shifts backward abruptly around the relatively almost stationary cam, moving the lug 81 into the path of the lug 82 and thereafter as it drops engaging this lug and tripping the shutter lever 84 of the camera 82. During the timing movement the latch 91—B has been in engagement with the teeth of the ratchet wheel 94 and has rotated the drum 95 winding up the cable 96 and raising the weight 97. The roller 72 dropping along the abrupt face of the cam strikes the arm 91—A and disengages the

detent 91—B from the ratchet wheel 94, permitting the weight 97 to return the drum to its initial point with the abrupt rise 99 of the flange 98 engaging the stop 100 and limiting the movement. Movement of the cam 70 continuing, the arm 91—A moves from beneath the roller 72 and through action of the spring 93 the detent 91—B is re-engaged with the teeth of the ratchet 94 of the drum 95 and rewinding of the weight cable upon the drum is recommenced. Should the vehicle remain for an additional similar period, an additional cycle is completed and an additional picture is taken. If the vehicle remains a length of time in excess of the picture taking capacity of the film it is contemplated that the vehicle would be removed by the authorities and hauled to a place where it would be impounded.

Should the vehicle leave the parking space before the first timing cycle is completed, or for that matter, before any subsequent timing cycle is completed, the vehicle in leaving the parking space would depress the plate 15. This depression of the plate 15 would shift the switch bar 27 to neutral position breaking the circuit to the motor and to the magnet 55. De-energization of the magnet 55 allows the spring 51—A to withdraw the dog 51 from the teeth of the ratchet wheel 52 and permit the weight 97 to return the cam 70 to initial position. During this return movement the roller 72 would roll downward along the face of the timing cam, depressing the lug 81 during such movement, but the arm 75 being held by the spring 77 against the stop 78, the movement of the lug 81 effects no engagement with the lug 82 and no picture is made. As the abrupt face 71 of the cam 70 approaches the roller 72, the roller engages the end 91—A of the latch member 91, disengaging the opposite end 91—B from the teeth of the ratchet wheel 94 permitting movement of cam 70 to cease. The weight 97 is released at such point but is again picked up on the start of another timing cycle movement.

In the alternate form the automobile enters the parking space and eventually encounters and comes to rest with one wheel on the plate 15—A, depressing the plate and starting the identical cycle of operation before described. When the vehicle leaves the parking space the wheel resting on the plate 15—A is withdrawn, the springs raise the plate, the switch is cut off and the cycle is terminated as before.

During the period in which the vehicle is parked the flag 119 lies flat against the top of the stand until the termination of the full parking period, at which time the roller 72 drops depressing the link 83 and taking the first picture in the camera. At such time the extension 115 of the link 83 swings the flag 119 to vertical position, indicating to the patrolman having charge that the vehicle has over-stayed the free parking time and that a picture has been taken. Should the vehicle thereafter depart within a fixed length of time the patrolman turns the flag down, unlocks the door of the stand and removes the roll of film from the camera, substituting therefor an unexposed roll, after which the door of the stand is closed and locked and the device is ready to again record over-time parking. If the stay becomes too extended, other and more drastic steps, as impounding the car, may be taken.

It is obvious that the patrolman may not be in the vicinity of the stand when the offending

vehicle leaves and that before he returns another vehicle may have taken its place. The patrolman therefore makes note of any vehicle which has parked over-time, and has thereby raised a flag, so that he may know that it has been replaced by another vehicle. The patrolman finding a replacing car unlocks the stand, removes the film and replaces it with a new film, it being immaterial how long the latter vehicle has been in the parking space when the film change is made, provided only that a full parking period has not elapsed since entry of the vehicle, and even in that case the result would merely be that there would be pictures of two over-time parkers on one film, and the record would be correct as to both.

From time to time the patrolman turns in the films collected, the films are developed and from the numbers recorded on the films, the ownerships of the vehicles are determined and proper notices sent to or served on the offenders.

It will be understood that much of the detail herein shown is illustrative only, and especially that a spring motor may be substituted for the electric motor in which case obviously a mechanical trip might be substituted for the electrical trip should it be deemed undesirable to retain the electrical trip. I wish it distinctly understood therefore that it is not by intent or purpose to confine myself to the details herein shown except insofar as such detail may be set out in any claim.

I claim:

1. In a parking regulator, means defining a parking space, a camera having a shutter trip, means supporting and directing the lens of said camera toward an end of a vehicle parked in said space; timing means, means carried by said timing means for engaging and operating said trip at predetermined intervals, means controlled by entrance and exit of a vehicle from said parking space for respectively starting and stopping said timing means, and means released by said stopping means for returning said timing means to initial starting point.

2. In a parking regulator, means defining a parking space, a camera having a shutter trip, means supporting and directing the lens of said camera toward an end of a vehicle parked in said space; timing means, means carried by said timing means for engaging and operating said trip at the termination of a predetermined interval, means controlled by entrance and exit of a vehicle from said parking space for respectively starting and stopping said timing means, and means released by said stopping means for returning said timing means to initial starting point.

3. In a parking regulator, means defining a parking space, a camera having a shutter trip, means supporting and directing the lens of said camera toward an end of a vehicle parked in said space; timing means, means for operably coupling said timing means to said trip after a predetermined interval, means controlled by entrance and exit of a vehicle from said parking space for respectively starting and stopping said timing means, and means released by said stopping means for returning said timing means to initial starting point.

4. In a parking regulator, means defining a parking space, a camera having a shutter trip, means supporting and directing the lens of said camera toward an end of a vehicle parked in

said space; timing means, including a constant speed electric motor, and a power circuit thereto, means carried by said timing means for engaging and operating said trip at predetermined intervals; a switch in said circuit, closed by entrance and opened by exit of a vehicle from said parking space for respectively starting and stopping said motor, and means released by opening said switch for returning said timing means to initial starting point.

5. In a parking regulator, means defining a parking space, a camera having a shutter trip, means supporting and directing the lens of said camera toward an end of a vehicle parked in said space; timing means, including a constant speed electric motor, and a power circuit thereto, means carried by said timing means for engaging and operating said trip after a predetermined interval, a switch in said circuit, means actuated by entrance of a vehicle into, and exit of said vehicle from, said parking space for respectively closing and opening said switch to start and stop said motor, and means released by cessation of current flow on opening said switch for returning said timing means to initial starting point.

6. In a parking regulator, means defining a parking space, a camera having a shutter trip, means supporting and directing the lens of said camera toward an end of a vehicle parked in said space; timing means, including a constant speed electric motor, and a power circuit thereto, means carried by said timing means for engaging and operating said trip at predetermined intervals; a switch in said circuit, means actuated by entrance of a vehicle into, and exit of a vehicle from said parking space, for respectively closing and opening said switch, for respectively starting and stopping said motor, and means released by opening said switch for returning said timing means to initial starting point.

7. In a parking regulator, means defining the parking position of an automobile, a camera having shutter operating means, means supporting and directing the lens of said camera toward an end of a vehicle parked in said position; a constant speed electric motor, speed reduction means driven by said motor, means including an electro-magnet adapted on energization and de-energization to respectively couple said reductions means to and uncouple said means from, said shutter operating means, a power circuit leading to said motor, means electrically coupling said circuit and said magnet, a switch in said power circuit, means actuated by moving a vehicle into and out of said position for respectively closing and opening said switch, and means operable on release of said coupling means for returning said shutter operating means to initial starting point.

8. In a parking regulator, means defining a vehicle parking position, a camera having shutter operating means, means supporting and directing the lens of said camera toward an end of a vehicle parked in said position, said shutter operating means, including a rotary member having a recurring operating position, a constant speed electric motor, speed reduction means driven by said motor, means including an electro-magnet adapted on energization and de-energization to respectively couple said reduction means to and uncouple said means from said shutter operating means, a power circuit leading to said motor, means electrically coupling said circuit and said magnet, a switch

in said power circuit, means actuated by entrance of a vehicle into and exit of said vehicle from said parking space for respectively closing and opening said switch, means operable on release of said coupling means for returning said shutter operating means to initial starting point, and means uncoupling said return means on completion of each shutter operation, said means recoupling said return means as each new cycle begins.

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5