United States Patent [19]

Zajac

[11] **3,913,718**

[45] **Oct. 21, 1975**

[54] **PARKING METER WITH INCREASED WINDING CAPACITY**

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[73] Assignee: **Qonaar Corporation**, Elk Grove Village, Ill.

[22] Filed: **Mar. 14, 1974**

[21] Appl. No.: **451,106**

[52] **U.S. Cl.** **194/72**; 194/DIG. 22; 58/141

[51] **Int. Cl.**[2] **G07F 5/00**

[58] **Field of Search** ..... 74/10.2, 526; 185/43; 58/141–143; 116/DIG. 21, 129; 194/DIG. 21, DIG. 22, DIG. 18, 72, 84

[56] **References Cited**

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Primary Examiner—Drayton E. Hoffman
Assistant Examiner—H. Grant Skaggs
Attorney, Agent, or Firm—McDougall, Hersh & Scott

[57] **ABSTRACT**

A coin controlled meter construction for obtaining the purchase of time including means for receiving a coin whereby time purchasing mechanisms can be actuated to indicate the amount of time purchased. A movable winding wheel is provided with engaging means for limiting the degree of movement of the winding wheel. This engaging means is resiliently held in association with the winding wheel and is positioned for engagement with a blocking means near the end of the winding movement. The engaging means is then adapted to yield in response to continued winding movement so that an increased amount of winding can be achieved.

9 Claims, 10 Drawing Figures

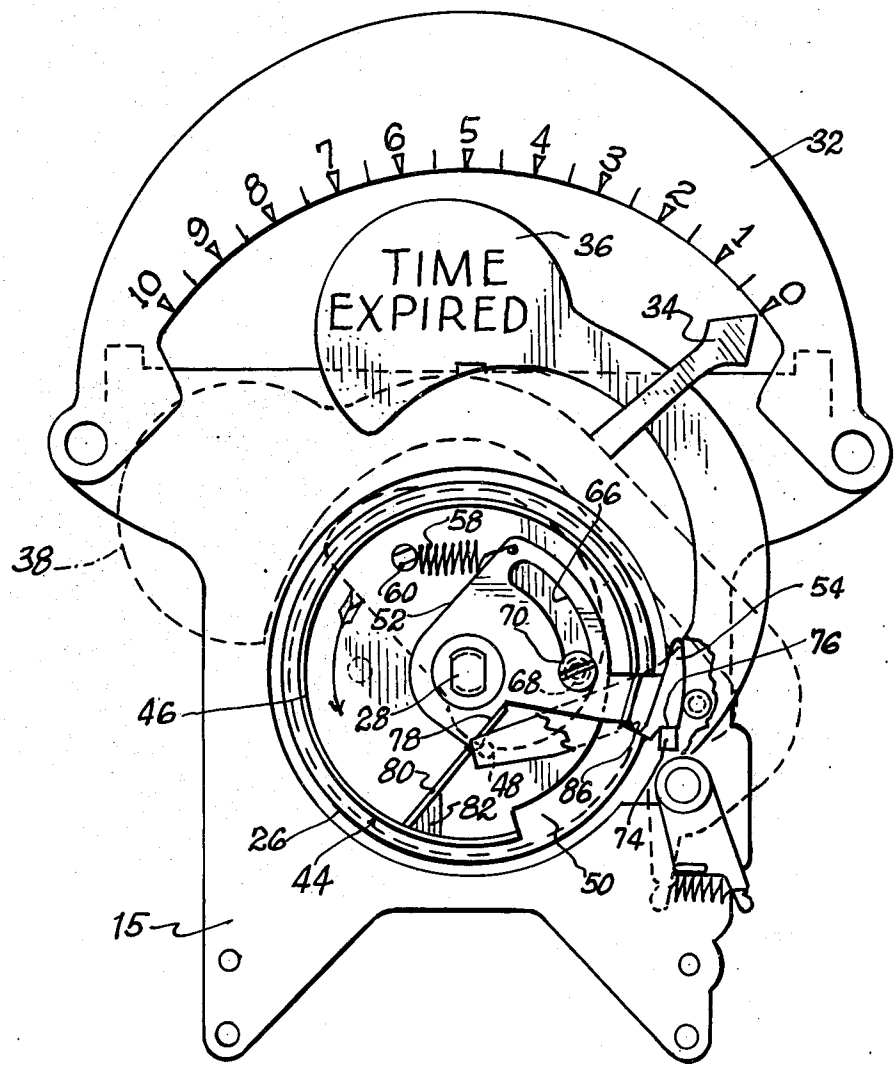


FIG. 1

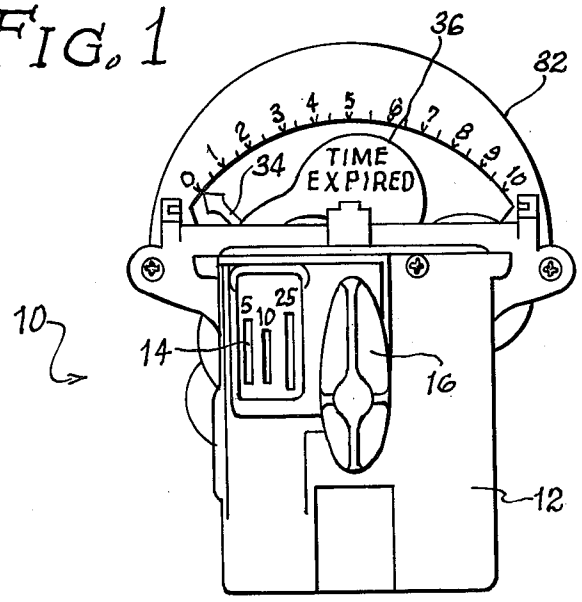

36
82
0 1 2 3 4 5 6 7 8 9 10
34
TIME
EXPIRED
10
5 10 25
14
16
12

FIG. 2

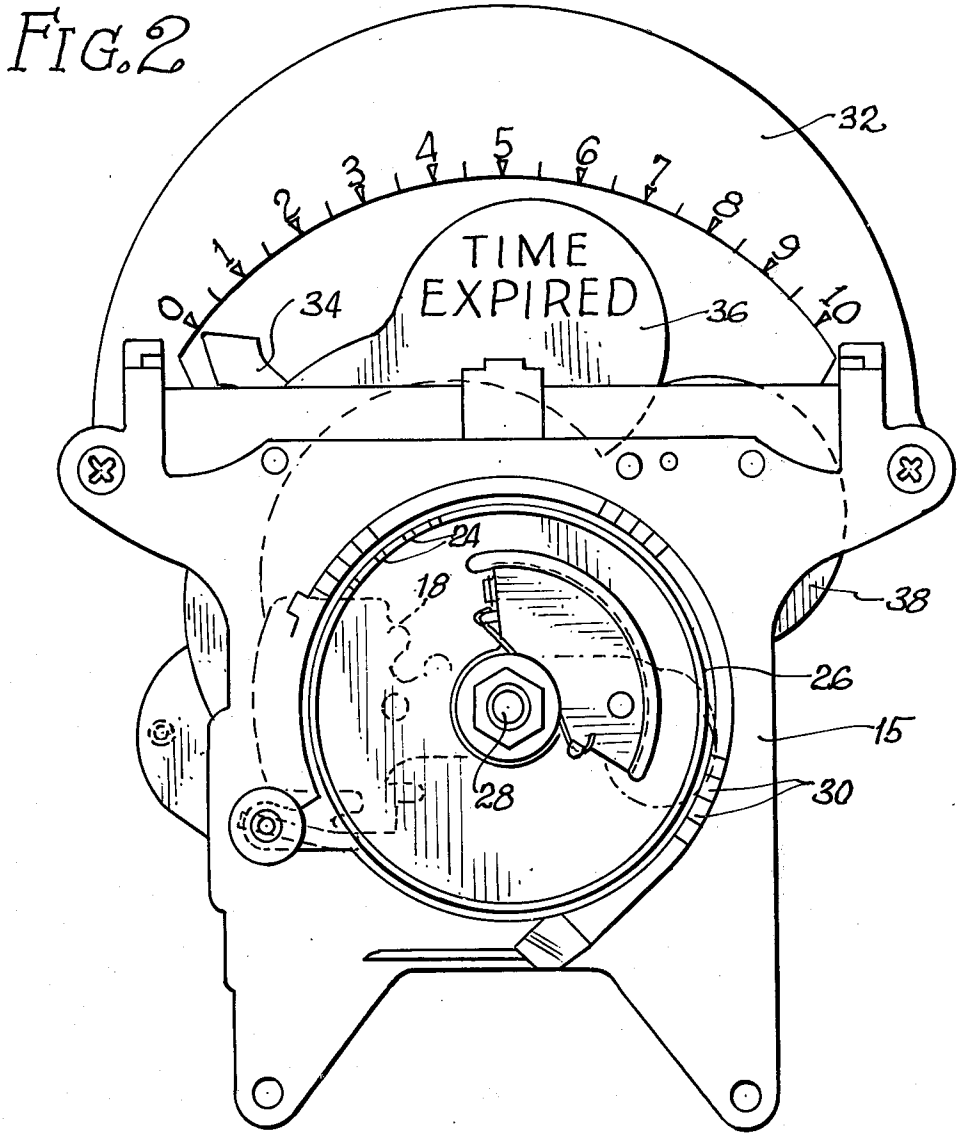

32
0 1 2 3 4 5 6 7 8 9 10
34
TIME
EXPIRED
36
24
18
38
26
15
28
30

FIG. 3

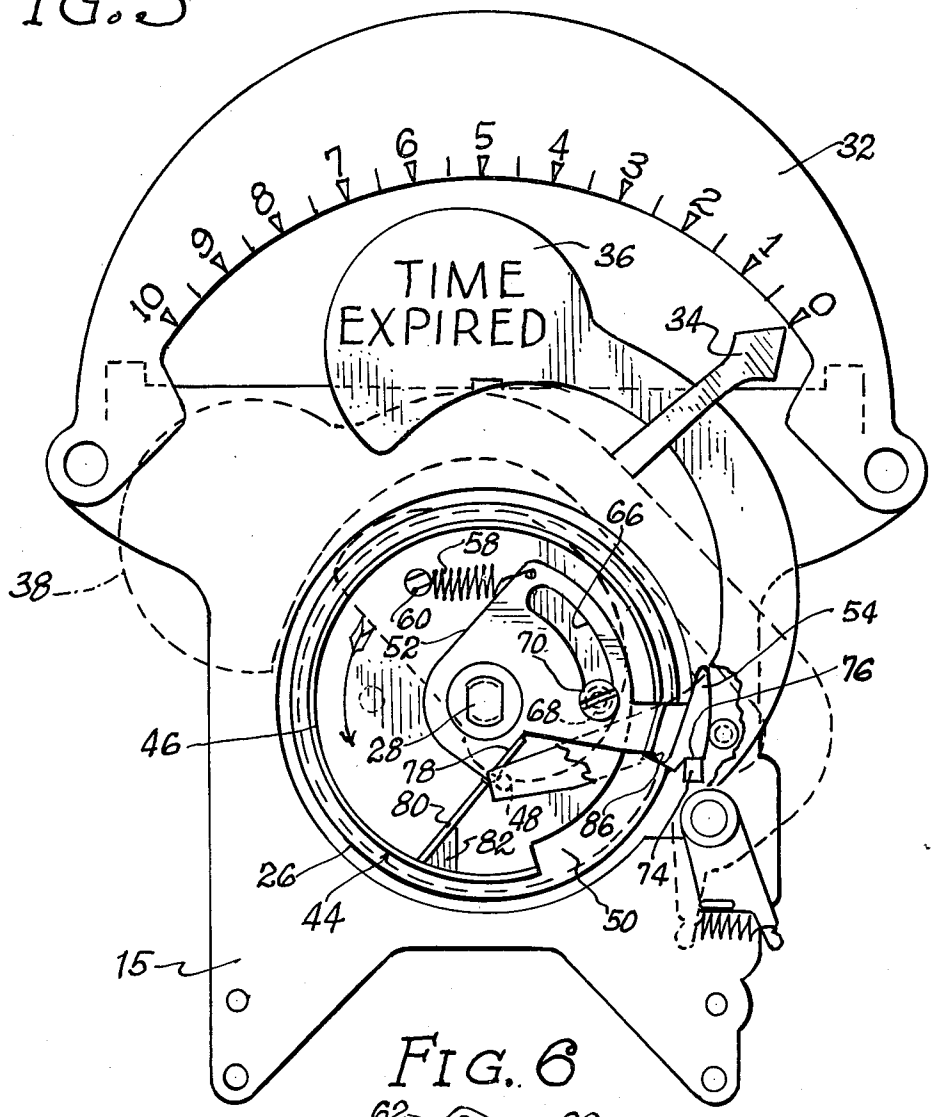


FIG. 6

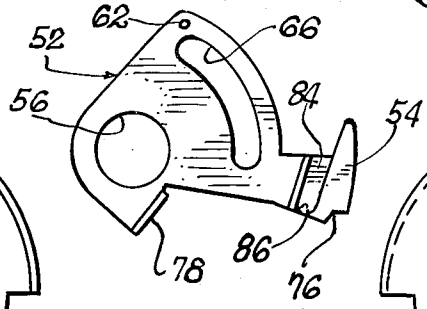


FIG. 4

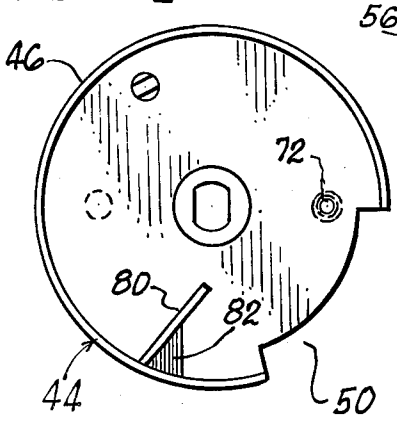


FIG. 5

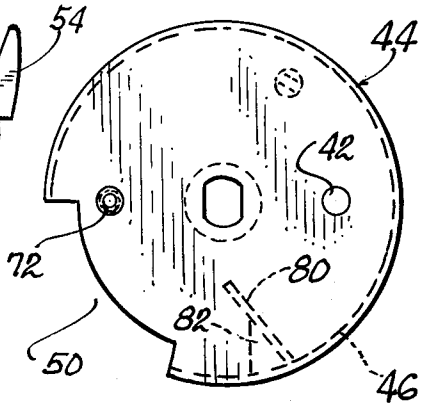


FIG. 7

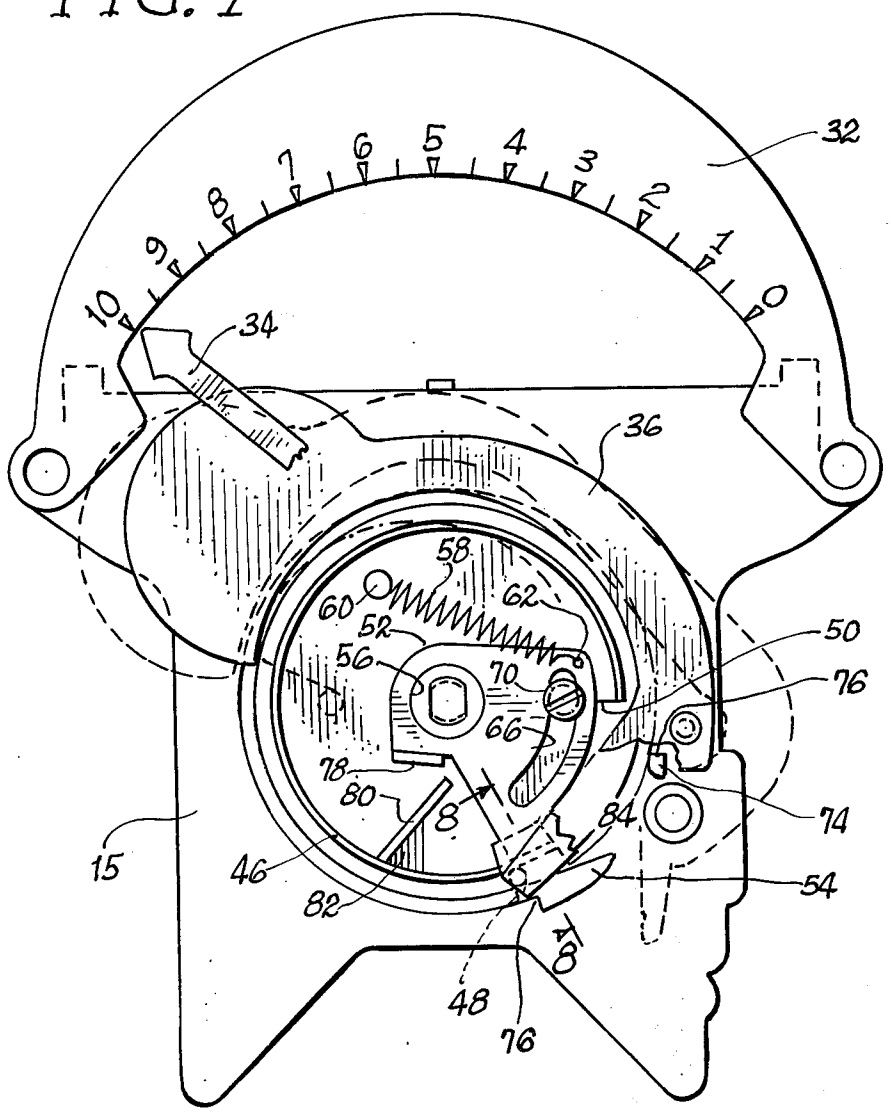


FIG. 9

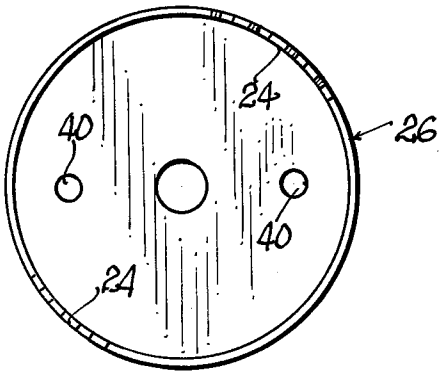


FIG. 8

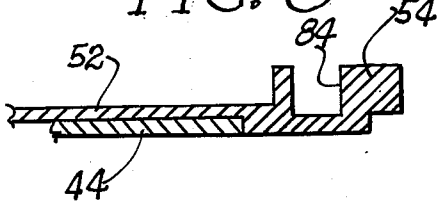
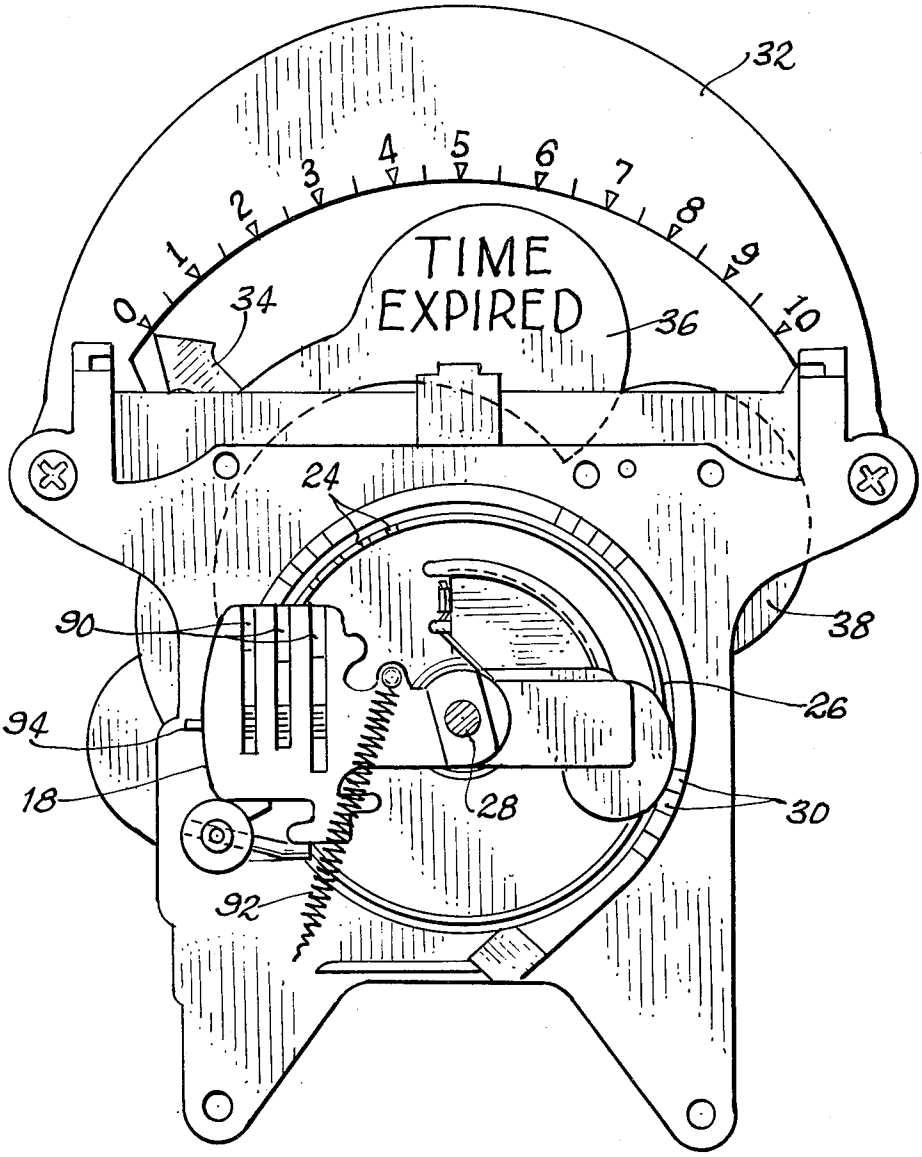


FIG. 10



PARKING METER WITH INCREASED WINDING CAPACITY

This invention is related to coin controlled constructions of the type utilized for the purchase of time. The invention is particularly applicable to parking meters wherein the amount of time purchased will provide a legal period for the use of a parking space by an automobile.

In a typical parking meter construction, an indicator means is employed for movement over a dial face to display the amount of time purchased. The indicator means permits the user to insert one or more coins and to then obtain a visual display of the legal period of time that the parking space is available to him.

In parking meter constructions, a mechanical clock mechanism is often employed. This mechanism is operated by means of a winding ring or the like with the degree of winding determining the amount of time purchased. Thus, the insertion of coins permits the user to achieve a certain amount of time and the clock mechanism then automatically runs down often in a manner such that the indicator will move over the dial face to give a continued display of the amount of time remaining.

Parking meters are desirably physically small structures and the winding mechanisms and clock mechanisms must, therefore, be confined within a relatively small space. This creates certain design difficulties, particularly where a large amount of time is to be made available for purchase with purchases of small increments being available. For example, meters are often designed to provide a maximum of 10 hours of time with the purchase rate being 5 cents per 15 minutes. The winding mechanism, for example a ratchet, must make provisions for 40 purchase increments upon the insertion of nickels while also permitting the purchase of 30 minutes of time for each dime insertion and 1 hour and 15 minutes of time for eachh quarter inserted. In the case of the often used ratchet arrangement, this requires in the order of 40 teeth on a ring, and the teeth must be relatively close together because of the space limitations. This has led to operating and design difficulties since closely spaced teeth require more precise pawl requirements to avoid any malfunction while also requiring greater mechanical strength in the materials used.

It is a general object of this invention to provide an improved parking meter construction which is more reliable in operation and more efficiently manufactured in terms of the mechansims utilized for obtaining the purchase of time.

It is a more specific objectt of this invention to provide a meter construction of the type described which incorporates an increased winding capacity so that the manufacturing efficiency and operating capabilities of the meter are improved.

These and other objects of this invention will appear hereinafter and for purposes of illustration but not of limitation, specific embodiments of the invention are shown in the accompanying drawings in which:

FIG. 1 is a front elevation of a parking meter housing section;

FIG. 2 is an elevational view of an intermediate meter section illustrating winding mechanisms incorporated therein;

FIG. 3 is a rear elevational view of the structure shown in FIG. 2; FIG. 4 is a detail view of a winding wheel utilized in the construction;

FIG. 5 is a rear view of the wheel shown in FIG. 4;

FIG. 6 is a detail view of a segment with stop lug employed in the construction;

FIG. 7 is an elevational view of the structure of FIG. 3 in the full wind position;

FIG. 8 is a cross-sectional view of the segment taken about the line 8—8 of FIG. 7; and,

FIG. 9 is a detail view of a winding ring utilized in the construction.

FIG. 10 is a front elevation of a parking meter of the type discussed herein.

This invention generally relates to a coin controlled meter construction, such as a parking meter, designed for obtaining the purchase of time. Such meters are adapted to receive a coin, token or the like, and means are controlled by the receiving means for locating an indicator in position for displaying the time purchased. These means for locating the indicator means include a movable winging wheel and blocking means in the path of the winding wheel for limiting the degree of wind. A stop lug or other engaging means is ordinarily carried by the winding wheel for engagement with the blocking means.

The improvements of this invention generally involve the location of the engaging means on the winding wheel in a manner such that the engaging means is movable with respect to the winding wheel. The engaging means is associated with a spring or other resilient means for normally holding the engaging means in a set position on the winding wheel. As the winding wheel nears the limit of its wind, however, the engaging means moves into contact with the blocking means at which time the winding wheel is adapted to continue movement in opposition to the action of the resilient means. This movement continues until a stop carried by the winding wheel moves into contact with the engaging means to thereby provide an end point for the winding operation.

The continued movement of the winding wheel which is permitted in accordance with the invention enables a more efficient construction of the meter in the sense that teeth on the meter winding ring can be placed farther apart for purposes of achieving a given number of increments of wind. This provides a stronger construction and the construction is more reliable because the more widely spaced teeth can be more accurately engaged by winding pawls. In addition to improving the efficiency of the meter, the concepts of the invention can alternatively be utilized for increasing the number of increments of wind to the extent that a greater interval of time can be displayed on the meter with a larger number of increments of purchase available.

FIG. 1 illustrates the mechanism frame 10 and a meter construction of the general type described in Sollenberger U.S. Pat. No. 2,603,288. The meter thus includes a front wall 12 defining slots 14 which provide for the receipt of coins by the meter. An operating handle 16 is rotatably positioned on the front wall, and a coin carrier 18 (FIG. 2) is located immediately behind the front wall. This coin carrier is secured to a shaft for rotation of the coin carrier upon turning of handle 16. The coin carrier defines slots for receiving coins in-

serted through slots **14** when the coin carrier is in the position shown in FIG. **2.**

In accordance with the description set forth in U.S. Pat. No. 2,603,288, the timing mechanism of the meter is set when a coin is positioned within the coin carrier **18,** and the handle **16** is rotated. The time setting operation involves the engagement of a pawl associated with the coin carrier with one of the teeth **24** formed on the winding ring **26.** The winding ring is tied to the shaft **28** of a clock mechanism for accomplishing the winding action necessary for setting the clock. A plurality of stationary ratchet teeth **30** are formed in a circular pattern around an opening defined by intermediate wall **15,** this opening receiving the ring **26** for rotation within the opening. These ratchet teeth are engageable with a separate pawl for preventing return movement of the coin carrier as long as a coin is positioned therein.

The meter construction also includes an indicator dial **32** which displays increments of time. A pointer **34** is adapted to be positioned upon completion of a clock wind operation for purposes of indicating the amount of time purchased. As the clock mechanism winds down, the pointer will gradually move back to the zero position. The meter includes a time expired flag **36** which displays the fact that there is no time left on the meter. A violation flag **38** is adapted to be moved into a display position when the handle **16** is in an intermediate position to eliminate improper use of the meter as explained in the Sollenberger patent.

The winding ring **26** defines openings **40** (FIG. **9**) which are aligned with openings **42** formed in a winding wheel **44** (FIGS. **3, 4** and **5**) in an assembled meter. By means of rivets or similar fasteners, the movement of the ring **26** and winding wheel **44** is, therefore, tied together.

As is also explained in the Sollenberger patent, the wheel **44** defines a peripheral surface **46** which is adapted to engage a pin **48** secured at the end of the time expired flag **36.** When time is wound on the meter, the engagement of this pin with the peripheral surface operates to hold the flag out of display position. As the clock mechanism runs down, the gap **50** defined by the wheel **44** eventually reaches the pin **48** so that the time expired flag is no longer restrained, and will move to the time expired position.

As described in the Sollenberger patent, there is a relationship between the winding wheel **44,** and the drive and receiving means combined in the carrier **18.** This relationship is more specifically illustrated herein in FIG. **10** wherein the carrier **18** is illustrated as having coin receiving slots **90.** The carrier is normally held in the position shown by means of a spring **92,** and the slots **90** are then aligned with the slots **14** defined by the front wall **12** of the meter housing. When coins are inserted, they are received and held by the carrier **18** whereby the carrier is adapted to be moved by means of handle **16** with the coins in place.

In accordance with this invention, and as best shown in FIG. **6,** a segment **52** is provided with a stop lug **54,** this lug being formed integrally with the segment. A central opening **56** permits location of the segment around the shaft **28** with the segment being free for movement relative to the winding wheel **44.** A spring **58** has one end attached to a post **60** carried by the winding wheel and the other end is received within a hole **62** formed in the segment.

The segment also defines a slot **66** which receives a pin **68** carried by the winding wheel. This pin defines an enlarged head **70** and is threaded into opening **72** defined by the winding wheel. The pin thus serves to confine the segment adjacent the face of the winding wheel while permitting relative movement to the extendt of the length of slot **66.** With the segment positioned on the winding wheel as shown in FIG. **3,** the stop lug is adapted. to contact a blocking post **74** which is held in a stationary position on the wall **15.** As shown in FIG. **3,** the back portion of the stop lug defines a notch **76** which receives the post **74** when the clock mechanism is completely wound down. Upon insertion of a coin and upon winding of the wheel, the stop lug is moved away from the post with the spring **58** holding the stop lug in a set position relative to the winding wheel.

The segment defines a wall section **78** which provides a bearing surface for the pin **48** of flag **36** and a wall **80** defined by the winding wheel forms a continuation of the wall section **78.** As the winding wheel rotates, the pin **48** is driven outwardly and into engagement with an inclined camming surface **82** which lifts the pin over the edge of wheel **44** for engagement with over the surface **46** thereby moving the flag **36** out of visible position.

As the winding wheel rotates, the segment eventually reaches the pin **48** and a groove **84** defined adjacent the stop lug **54** is aligned with the pin for receipt of the pin in the groove as the segment movement continues. The end of the groove is partially closed at **86** so that the pin becomes captured stopping further movement of the segment. At this point, however, the movement of wheel **44** can continue in opposition to spring **58** until a full 360° of wind is accomplished.

In a typical structure of the type described, the winding disc **26** will define 40 teeth **24** with the distance between teeth being controlled to provide 15 minutes of wind. With the meter time expired, and assuming time is purchased for five cents per **15** minutes, the insertion of a nickel will cause a pawl to catch the last tooth while the insertion of a dime will cause the pawl to catch the second last tooth. This fifth last tooth would be engaged upon the insertion of a quarter. The insertion of coins adding up to 2 dollars will thus lead to the purchase of 10 hours of time.

As shown by a comparison of FIGS. **3** and **7,** the pin head **70** moves 360° from the beginning to the end of a complete wind, whereas without the slotted segment, the movement is less than 360°. Since the winding wheel is adapted to rotate a greater number of degrees than normally allowed, the teeth **24** can be spaced apart by a distance equal to **1/40th** the increased number of degrees of wind. This provides a stronger construction since the amount of metal between teeth is increased. Furthermore, the pawl operation can then be less accurate since there is a greater margin for error provided for the greater spacing between teeth. The unique structure of the invention is also available for simply increasing the number of teeth in which case the conventional spacing can at least be retained.

It will be understood that various changes and modifications may be made in the above described construction which provide the characteristics of the invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

1. In a coin controlled meter construction for obtaining the purchase of time including means for receiving a coin, a movable winding wheel and drive means carried by the receiving means for operating the winding wheel, the improvement comprising engaging means carried by the winding wheel for limiting the degree of movement of the winding wheel, said engaging means being mounted on said winding wheel for movement therewith, resilient means normally holding said engaging means in position on the winding wheel, blocking means in the path of movement of said engaging means, said resilient means yielding upon engagement of said engaging means with said blocking means whereby said winding wheel is adapted to continue movement relative to said engaging means after said engagement, and including a stop carried by said winding wheel for engagement with said engaging means after said relative movement to thereby control the full degree of movement of the winding wheel.

2. A construction in accordance with claim 1 wherein said stop comprises a pin carried by said winding wheel, said engaging means defining a slot receiving said pin.

3. A construction in accordance with claim 1 wherein said engaging means includes a stop lug extending beyond the edge of said winding wheel, said blocking means being positioned adjacent said edge.

4. A construction in accordance with claim 3 wherein said winding wheel comprises a substantially circular member mounted for rotary movement, said engaging means comprising a segment which defines said stop lug being mounted co-axially with said winding wheel, said segment defining a slot, and said winding wheel carrying a pin received within said slot.

5. A construction in accordance with claim 4 wherein said resilient means comprises a spring having one end attahed to said winding wheel and the other end attached to said segment, said segment being restrained by said blocking means in opposition to the force of said spring as said winding wheel completes its full degree of rotary movement.

6. In a coin controlled meter construction for obtaining the purchase of time including means for receiving a coin, a movable winding wheel and drive means carried by the receiving means for operating the winding wheel, the improvement comprising engaging means carried by the winding wheel for limiting the degree of movement of the winding wheel, said engaging means being mounted on said winding wheel for movement therewith, resilient means normally holding said engaging means in position on the winding wheel, and blocking means in the path of movement of said engaging means, said resilient means yielding upon engagement of said engaging means with said blocking means whereby said winding wheel is adapted to continue movement relative to said engaging means after said engagement, said winding wheel rotating more than 360° from the position of zero time purchased to the position of maximum time purchased.

7. A construction in accordance with claim 6 including a winding ring for moving said winding wheel, said ring defining spaced apart teeth engageable by drive pawl means associated with said means for receiving a coin.

8. In a coin controlled meter construction for obtaining the purchase of time including means for receiving a coin, a movable winding wheel and drive means carried by the receiving means for operating the winding wheel, the improvement comprising engaging means carried by the winding wheel for limiting the degree of movement of the winding wheel, said engaging means being mounted on said winding wheel for movement therewith, resilient means normally holding said engaging means in position on the winding wheel, blocking means in the path of movement of said engaging means, said engaging means including a stop lug extending beyond the edge of said winding wheel, said blocking means being positioned adjacent said edge, said resilient means yielding upon engagement of said engaging means with said blocking means whereby said winding wheel is adapted to continue movement relative to said engaging means after each engagement, and a flag structure for visually displaying a time expired condition, a stop pin carried by the flag structure, and means moving the stop pin into the path of said stop lug upon movement of said winding wheel, said stop pin serving as said blocking means, said flag structure moving out of display position simultaneously with movement of said stop pin.

9. In a coin controlled meter construction for obtaining the purchase of time including means for receiving a coin, a movable winding wheel and drive means carried by the receiving means for operating the winding wheel, the improvement comprising engaging means carried by the winding wheel for limiting the degree of movement of the winding wheel, said engaging means being mounted on said winding wheel for movement therewith, resilient means normally holding said engaging means in position on the winding wheel, said engaging means being carried with said winding wheel and being held in a stationary position relative to the winding wheel by said resilient means during a substantial portion of the time purchase operation, blocking means in the path of movement of said engaging means, said engaging means including a stop lug extending beyond the edge of said winding wheel, said blocking means being positioned adjacent said edge to engage said stop lug after said substantial portion of the time purchase operation and before completion of said operation, said resilient means yielding upon engagement of said engaging means with said blocking means whereby said winding wheel is adapted to continue movement relative to said engaging means after said engagement to achieve completion of the time purchase operation.

* * * * *