

1

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COIN COLLECTION SYSTEM FOR MULTIPLE PARKING METER STATIONS

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ABSTRACT OF THE DISCLOSURE

The disclosure describes a fluid pressure system for collecting coins deposited in parking meters. Each meter is mounted on a hollow post connected to a conduit through which a free movable plug is driven pneumatically, or hydraulically or by vacuum. Coins fall into the conduit and are driven by the plug to a coin collection receptacle. The plug is driven by air or water pressure created by an air blower or pump at one end of the conduit.

The invention is directed to a pneumatic, hydraulic or vacuum system for collecting coins from a multiplicity of parking meters.

Heretofore, it has been conventional to provide parking meters with individual coin receptacles. These receptacles are retained in locked chambers in the parking meters and are collected by duly authorized collectors who manually unlock each parking meter. A great deal of time and labor is consumed in this method of coin collection. If an unauthorized person obtains the keys to a number of parking meters as often happens, the coins deposited in the meters by patrons of parking areas where the meters are located are stolen. The need has long existed for some way of simplifying and expediting the collection of coins from parking meters and for improving the security of the deposited coins against theft.

The present invention is directed at solving these long standing problems in a relatively simple, effective and economical way. According to the invention, the parking meters have no coin collection boxes. Instead of this the coins are deposited in the meters and drop down through hollow posts on which the meters are mounted, to a pneumatic, hydraulic or vacuum conduit buried in the ground. Each post is provided with a check valve which serves the multiple purposes of defeating attempts at tampering, guiding coins into the conduit, and preventing escape of air or water through the parking meter posts. At one end of the conduit is an inlet and at the other end is an outlet. A free movable plug or pig is inserted into the inlet, and the air or water is forced into the inlet by a blower or pump. If the pump is located at the air inlet, pressure in the conduit will be greater than atmospheric pressure. If the pump is located at the outlet, then the pump will create a suction and the air in the conduit will be less than atmospheric pressure. In any case the plug drives coins before it through the conduit to a coin collection receptacle at the outlet. There the plug is held and can be removed for reinsertion into the inlet of the conduit for repeating the coin collection cycle. A whistle can be inserted into the conduit, preferably at the outlet which provides an audible signal when coins are being collected. This enhances the security of the system, since this audible alarm will discourage thieves from attempting theft of coins from the system. Further advantages are derived from the fact that the parking meters are simpler in construction and more economical to manufacture and install since they have no locked coin collection boxes. Furthermore, they will have longer useful lives since they contain no coins, which discourage tampering. Thus losses and damage from this type of vandalism are eliminated.

2

An advantage of my system is that a truck equipped with special machinery may be parked near the conduit outlet, and the truck's special machinery may be directly connected to the conduit outlet. The coins could be collected, sorted, counted and packed all by the machinery. No person authorized or unauthorized could tamper with the coins. Even an official employee could not steal any coins. A single equipped truck could accomplish many times the work of a large number of working people using the present system of collection.

It is, therefore, one object of the invention to provide a multiple parking meter installation with a pneumatic or hydraulic coin collection system.

A further object is to provide a multiple parking meter installation in which the meters have no individual removable coin collection boxes or individual coin collection receptacles.

Another object is to provide a pneumatic or hydraulic or vacuum coin collection system for parking meters in which a free or movable plug is driven by fluid forced through the conduit to push coins through the conduit to a coin collection point.

For further comprehension of the invention and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIGURE 1 is a side view partially in section of a coin collection system embodying the invention.

FIG. 2 is and FIG. 3 is an enlarged horizontal, transverse sectional view taken on lines 2-2 and 3-3 of FIG. 1 respectively.

FIG. 4 is an enlarged fragmentary vertical sectional view taken on line 4-4 of FIG. 1.

FIG. 5 is a diagrammatic plan view of a parking meter installation equipped with a system embodying the invention.

FIG. 6 is a side view partially in section of another coin collection system embodying the invention.

FIG. 7 is an enlarged fragmentary horizontal sectional view taken on line 7-7 of FIG. 6.

FIG. 8 is a side view partially in section of a further coin collection system embodying the invention.

Referring first to FIGS. 1-4, there is shown a system 10 in which a plurality of parking meters 12 are mounted on hollow vertical posts 14. In each meter is a timing device 16 of conventional type. The timing device includes a pointer 18 which moves along a dial 20 to indicate elapsed time. The timing device is actuated when a coin 21 is inserted through a slot 22 and engages a lever 24 projecting from the timing device. The coin passes down through a chute 25 in the meter. This chute communicates with hollow passage 26 in the post 14.

Each post is embedded in concrete or asphalt pavement 28 overlaying the ground 30. The posts are coupled by flanges 31 to axially vertical branch pipes 32 which extend laterally upward from a horizontal conduit 34. In each pipe 32 is a check valve 35. This valve includes a ring 36 which has a tapered passage with narrow opening 38 through which a coin passes. Under the narrow bottom opening of the ring is a valve member in the form of a thin light plate 40. This plate has a radial arm 43 joined to a pintle 44 engaged in ears 46 extending inwardly of pipe 32. A coil spring 46 on the pintle bears at one end underneath the plate 42 to hold it closed against the bottom of ring 36. When a coin is deposited in the meter 12 it passes the timing device 16 and falls down on plate 40. The plate then opens to permit the coin to drop down into a conduit 34. After the coin passes, the spring 46 re-

turns the plate to closed position against the ring 36.

One end 34' of the conduit 34 is extended above ground by bends 48, 49 of large radius. End 34' of the conduit is threaded and engages a coupling nut 50. The nut 50 can be advanced to engage threaded nipple 52 at the end of flexible tubing 54. The tubing is connected to the air outlet 55 of an air blower or pump 56. The blower has an electric cord 58 which can be connected to a convenient electric power supply. Air enters the blower at inlet 59 and is driven through the conduit 34 by the air stream applied by the blower.

A cylindrical plug 60 is shown freely disposed in the conduit. This plug has a diameter only slightly smaller than the inside of the conduit 34. The plug moves freely under impetus of air pressure and pushes coins 21' through the conduit. The coins collect in piles in the conduit under the posts 14. The plug 60 is inserted at the inlet end 34' of conduit 34 by loosening nut 50 from nipple 52 and bending tubing 54 out of the way. After plug 60 is inserted the nut 50 is again engaged with nipple 52.

The outlet end 34'' of the conduit is elevated above ground by bends 61, 63. At end 34'' is a removable threaded cap 62. The plug 60 will be stopped at this cap as shown by dotted lines in FIG. 1. Spaced from the cap 62 a distance slightly greater than the length of plug 60 is an axially vertical depending branch pipe 64. A removable coin receiver box 66 has a threaded inlet 68 coupled to pipe 64 by a coupling nut 70. The nut 70 can be disengaged from inlet 68 to release the box. Coins driven by the plug 60 will drop into the box 66 through opening 72 in the conduit 34.

A branch pipe 74 extends upwardly in axial alignment with pipe 64. Pipe 74 serves to release air from the conduit. A ring 75 with constricted opening 76 can be provided in pipe 74. This ring will serve as a whistle which sounds continuously while air is passing therethrough and indicates that a coin collection cycle is in operation.

To operate the system it is only necessary to insert the plug 60 at the inlet end 34' and connect the blower 56. The coin receiver box 66 will be connected at the outlet 34''. When the blower is turned on, the plug 60 will be driven by air pressure through the conduit. Air cannot escape through the posts 14 because valve plates 42 are all held closed to rings 36 by air pressure and by springs 46. The plug 60 pushes coins 21' before it until all the coins fall through opening 72 into box 66 and the plug 60 stops at cap 62. By this arrangement the coins are collected in a few seconds from many parking meters.

It is possible to omit the valve plates 42 if only a few parking meters are employed in the system. Only a negligible loss in pressure of air driving the plug 60 will be encountered because the aggregate cross sectional areas of all coin entrance slots 22 of the meters 12 are much less than the large cross sectional area of conduit 34. For example, if ten or less parking meters are employed the aggregate cross sectional area of all slots 22 will be less than a square inch as compared with the larger cross sectional area of several square inches of conduit 34. However, rings 36 or equivalent obstructions in the posts should be employed to guide the coins into the conduit 34 and to prevent removal of coins from the conduit via the posts if the meters are removed by unauthorized persons.

FIG. 5 shows an array of parking meters 12 on a parking field 80. Lines 82 outline the several parking spaces 84. Motorists who park automobiles 85 in the parking spaces deposit coins in the parking meters. These coins all fall into conduit 34. It will be noted that the conduit extends around the field in a loop so that both inlet and outlet ends 34', 34'' are close to each other. This is for the convenience of the collector who has at one collection point both the air blower 56 and coin collection box 66. After the coins are collected, the portable air blower, coin collection box and plug 60 can be removed by pre-

vent operation of the coin collection system by unauthorized persons.

FIG. 6 shows system 10A which is generally similar to system 10 and corresponding parts are identically numbered. In this system conduit 34a has an internally threaded inlet end 34a' embedded in the pavement 28a. This end is normally closed by a threaded plug 83. The plug 83 can be removed and plug 60 can be inserted into the open inlet of the conduit. At the other end 34a'' of conduit tubing 54 of air blower 46a is connected by coupling nut 50'. The blower is reversed in direction so as to serve as a suction pump. Air is drawn out of the conduit at end 34a'' while air enters the inlet 34a' to push plug 60 along the conduit. The plug 60 in turn pushes the coins 21' along until they drop into box 66. A ring 87 can be set into nipple 52 of the tubing 54. This ring will serve as an abutment to stop the plug 60. It will also serve as a whistle to emit an audible signal when the blower or pump 56 is in operation to indicate that coins are being collected from the system. System 10A has the advantage that both the blower and coin collection box are located at the same point. However, system 10 has the advantage that it operates at higher pressure created by the blower forcing air through the conduit. System 10A operates only at lower, atmospheric pressure under suction created by the blower. Thus system 10 can handle a greater load of coins 21' than system 10A.

It is impossible to omit the valve plates 42 from posts 14 in system 10A because as mentioned above in connection with system 10, this omission will have only negligible effect in reduction of pressure acting on plug 60. In fact, it may even have a beneficial effect because as the plug 60 passes each post, the slight pressure of air passing down the passed post will add to the pressure of air pushing the plug through conduit 34a.

In FIG. 8 is shown a system 10B similar to system 10 and corresponding parts are identically numbered. This system is arranged to employ water pressure. A hydrant 100 controlled by a valve 102 is connected via tubing 54a and coupling nut 50'' to inlet 34b' of conduit 34b. The nut can be disengaged from nipple 52' to permit plug 60 to be inserted into the inlet end 34b' of the conduit. At the outlet end 34b'' is coin collection box 66'. This box has a screen 104 in its bottom. The box rests on a grid plate 106 over drain pipe 108.

In operation of system 10B, the plug is driven through the conduit 34b by water W under pressure. The plug 60 terminates its travel at cap 62 as indicated by dotted lines. The water W driving the plug enters the box 66' and drains down into the drain pipe 108. Once the plug 60 reaches the end of conduit 34b at cap 62, the water supply at hydrant 102 can be turned off. After the coins are collected, the coin collection box 66' will be removed along with plug 60. If an unauthorized person turns on the hydrant, the water will pass by any coins collected in the conduit and will not discharge them from the outlet end of the conduit. Tubing 54b can also be removed after coin collection is completed to increase security of the system.

Valves 35 in the posts 14 prevent water under pressure from passing up through the posts. However, where only a few meters and posts are used in the system, it is possible to omit the valve plates 42 and this omission may even have a beneficial effect. If the valve plates are omitted, air in the conduit can pass up the posts to relieve pressure in front of the advancing plug 60 driven by water. Since the plug moves very rapidly, it takes only a few seconds to transverse conduit 34b. During this time air is escaping from the narrow slots 22. By the time the plug reaches end 34'' of the conduit, the water level in the posts will still be below the meters 12. Thus the water supply can be turned off at hydrant 100 before any water escapes from the meters. For systems have a large number of meters, ten or more for example, it is preferable to employ the one-way check valves 35. In any case the

rings 36 or other restrictive elements should be employed to guide the coins into the conduits and to defeat attempts at theft of coins from the conduit 34b by removing meters 12 from the posts 14.

It will be noted that in all forms of the invention, there is no lock and key arrangement for securing coins. All coin collection is performed pneumatically or hydraulically. The meters 12 on posts 14 have no coin receiving or collecting boxes. If a meter is removed from a post and broken open it will not yield any coins because no coins are collected in it. This discourages tampering and attempts at theft. Removal of a meter from a post by vandalism will not adversely affect operation of the coin collection system since the one-way check valve 35 in the affected post will remain permanently closed. Since the meters contain no coin collection boxes they can be manufactured more economically than conventional meters.

It will be noted that the posts 14 have flanges 31 engaged with upper ends of the pipes 32. These flanges serve to anchor the posts securely in the pavement so that they cannot easily be pulled out without breaking the pavement.

The systems described thus provide easy, quick and effective means for collecting coins from a multiplicity of parking meter stations. They discourage tampering, theft and vandalism. Also, much time and labor are saved in coin collecting.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

I claim:

1. A multiple parking meter system, comprising a generally horizontal underground conduit having inlet and outlet ends, located above the ground, a plurality of vertical posts connected to the conduit at spaced points, meters for receiving coins mounted on the posts respectively, each of said posts being hollow for passing coins therethrough from the meters to the conduit, means for supplying fluid under pressure to the inlet end of the conduit, and a coin collection receptacle at the outlet end of the conduit, said outlet end of the conduit having an opening for discharging said fluid therefrom, said conduit having a clear passage therethrough from end to end thereof, and a free plug for passing through said passage under pressure of said fluid from said inlet end to the outlet end of the conduit so that coins in the conduit are pushed by the plug out of said outlet end and into said coin collection means.

2. A multiple parking meter system as recited in claim 1, further comprising a one-way check valve in each post for passing coins downwardly through the post to the conduit while preventing fluid under pressure from passing upwardly through the post.

3. A multiple parking meter system as recited in claim 1, wherein the means for supplying fluid at said inlet end of the conduit is a blower providing air under pressure

greater than atmospheric pressure, said blower being detachably connected to said inlet end of the conduit.

4. A multiple parking meter system as recited in claim 1, wherein the means for supplying fluid under pressure at said inlet end is a suction creating device located at and detachably connected to the outlet end of the conduit to draw air therefrom so that said atmospheric pressure enters the inlet end of the conduit.

5. A multiple parking meter system as recited in claim 1, wherein the means for supplying fluid at the inlet end of the conduit is a high pressure water supply source detachably connected to the inlet end of the conduit.

6. A multiple parking meter system as recited in claim 5, wherein the coin collection receptacle is a box having a perforated bottom for retaining coins while passing water therethrough, and a drain pipe in the ground communicating with the outlet end of the conduit through said box for receiving water therefrom.

7. A multiple parking meter system as recited in claim 1, further comprising an abutment at the outlet end of the conduit for holding said plug thereat after the coins pushed to the outlet end of the conduit by the plug pass into the coin collection receptacle.

8. A multiple parking meter system as recited in claim 1, wherein the conduit is arranged in a loop so that the inlet and outlet ends are close to each other, and quick detachable coupling means connecting said fluid supply means and said coin collection receptacle to the conduit, whereby the fluid supply means and the coin collection means can be removed from the conduit to prevent unauthorized removal of coins from the conduit.

9. A multiple parking meter system as recited in claim 1, further comprising quick detachable coupling means connecting said fluid supply means and said coin collection receptacle to the conduit, whereby the fluid supply means and coin collection means can be removed from the conduit to prevent unauthorized removal of coins from the conduit and so that the plug can easily be inserted in the inlet end of the conduit and removed from outlet end of the conduit, and fluid actuated sound producing means located at the outlet end of the conduit for indicating audibly that fluid is passing through the conduit.

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