Oct. 14, 1941. J. WEISINGER 2,258,872

START AND STOP MECHANISM

Filed Aug. 27, 1938 4 Sheets-Sheet 1

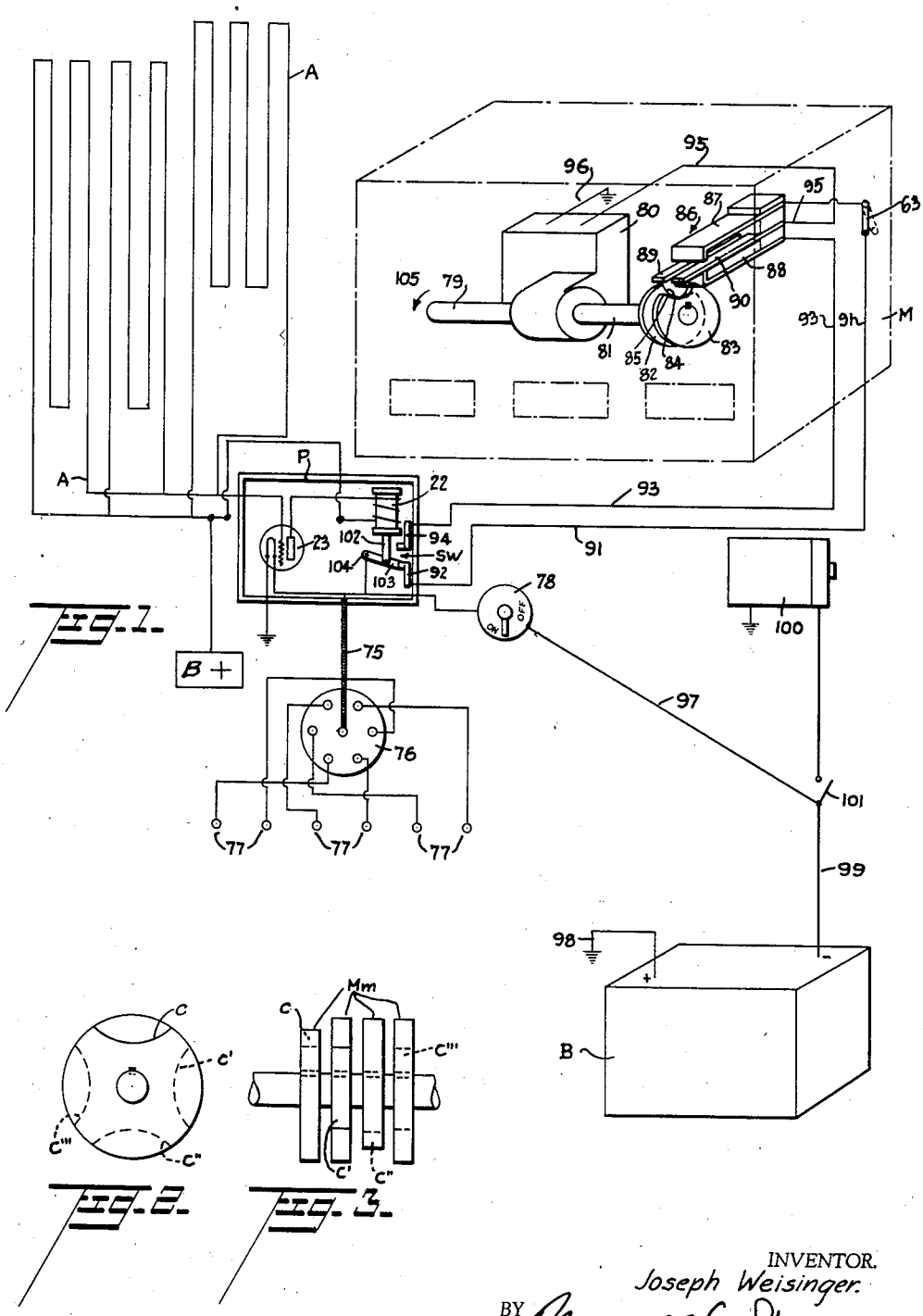

Fig. 1.

Fig. 2.

Fig. 3.

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START AND STOP MECHANISM

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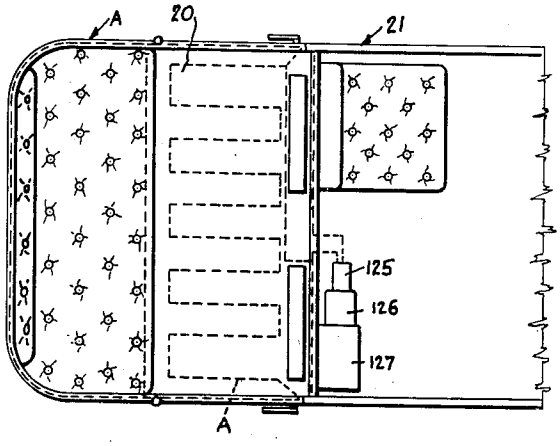

Fig. 4.

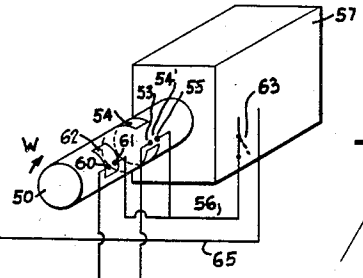

Fig. 5.

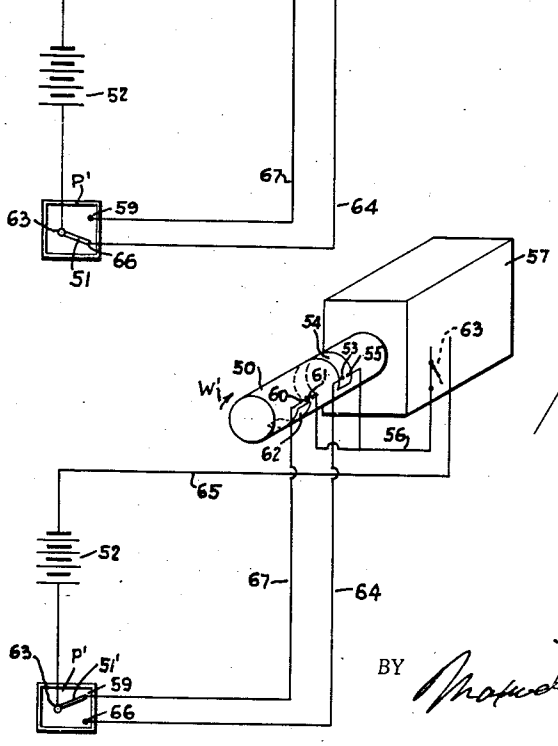

Fig. 6.

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START AND STOP MECHANISM

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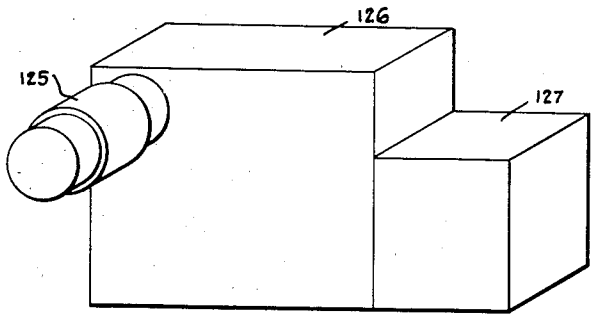

Fig. 7.

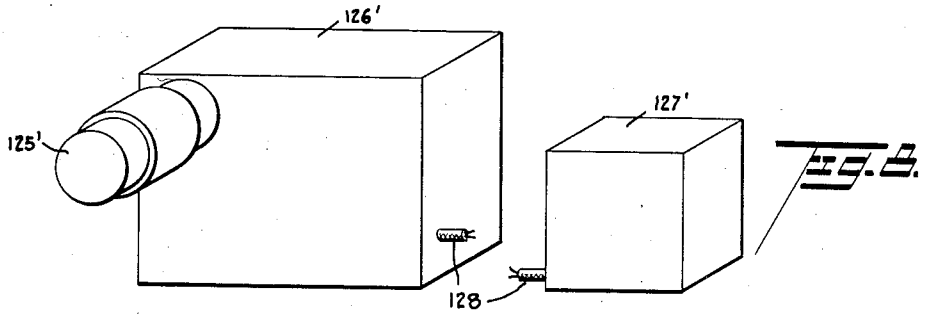

Fig. 8.

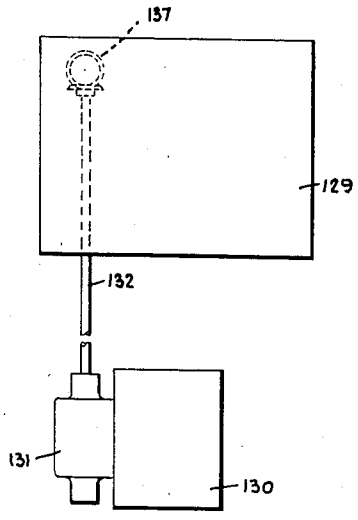

Fig. 9.

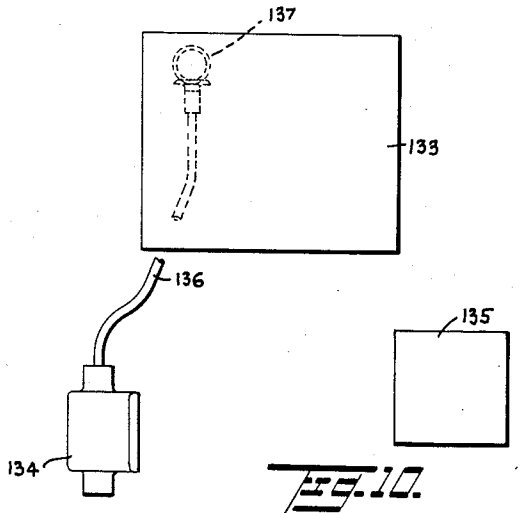

Fig. 10.

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START AND STOP MECHANISM

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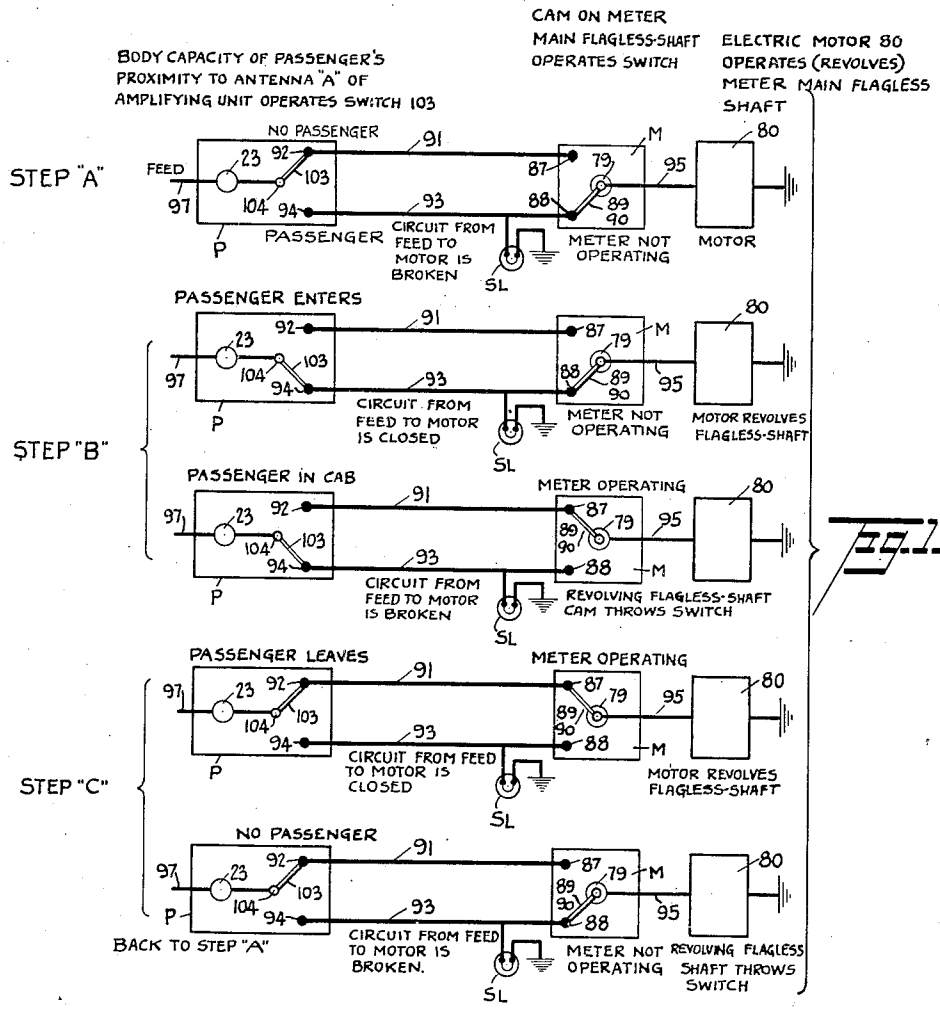

Fig. 11.

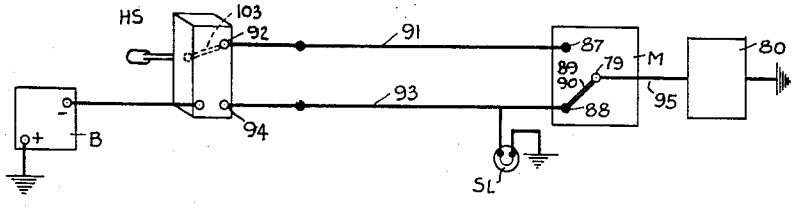

Fig. 12.

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Patented Oct. 14, 1941

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UNITED STATES PATENT OFFICE

2,258,872

START AND STOP MECHANISM

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Application August 27, 1938, Serial No. 227,069

3 Claims. (Cl. 235—30)

This invention is an automatic start and stop mechanism for rotative devices including taximeters, registers and recording meters and particularly refers to an automatic taximeter control whereby the presence of the passenger in the cab will actuate and control the operation of the meter.

It is an object of the present invention to provide an accurate, efficient, dependable, and economical automatically operable stop and start mechanism employable in conjunction with or part of a taximeter, register, recording meter or the like.

It is another object of the present invention to overcome the existing disadvantages inherent in present day taximeters. Amongst these disadvantages will be found the ease with which the meter may be tampered by the operator of the taxicab, the opportunity available for failing to register the fare and the temptation offered the driver to pocket the fare.

A further object of the present invention resides in providing means for preventing the cutting out of the taximeter by an operator attempting to avoid the registration of the fare.

Further objects and advantages of the invention will appear from the following disclosures thereof together with the attached drawings which illustrate certain forms of embodiment thereof. These forms are shown for the purpose of illustrating the invention since the same have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the drawings:

Fig. 1 is a diagrammatic view of an embodiment of the invention in a preferred construction.

Figs. 2 and 3 show cams employed in the combination shown in Fig. 1, when more than one tariff is desired.

Fig. 4 is a diagrammatic top plan view of a portion of a taxicab, locating various parts of an embodiment of the invention and their co-relation.

Figs. 5 and 6 are diagrammatic views of a modified construction of the device for a single tariff.

Figs. 7, 8, 9 and 10 show modifications in the arrangement of several parts of the device in relation to each other.

Fig. 11 is a schematic diagram showing the various stages of operation of a device made in accordance with this invention.

Fig. 12 is a schematic diagrammatical view of a modified form of the invention.

Referring to Fig. 1, the arrangement therein depicted as an example of carrying out the invention, comprises generally a device A adapted to become affected by body capacity of a passenger who may enter the taxicab (not shown), an amplifier P to amplify the electrical effect produced in the device A by presence of the passenger, the amplifier controlling the main switch SW which in turn controls the electric power supply, such as, the battery B, to the taximeter in box M which includes the mileage registering mechanism not shown in the drawing.

The device A is located within the passenger compartment of the taxicab (not shown) such that the proximity of the body will always be within induction distance of the device A regardless of where the passenger locates himself in the taxicab. This device A may comprise braided or plain metal wire or screening or suitable metal plates concealed within the body of the vehicle and suitably insulated. P illustrates diagrammatically an amplifying unit including a solenoid **22**, an amplifier tube **23** and a switch SW operated by the solenoid **22**, other parts (not shown) in the amplifying unit required to efficiently operate the tube **23** will be contained in the unit. These parts are of standard design, and therefore, not shown. From the amplifying unit one conductor **75** preferably leads to the conventional distributor **76** of the motor vehicle, which distributor controls the firing of the spark plugs **77** of the vehicle engine. This is done to prevent the tampering with or the cutting out of the taximeter registering device by a dishonest driver, which otherwise may be accomplished by short-circuiting the current from switch **78** to distributor **76**. The lead **75** is preferably constructed of locked armored covered cable. Since the distributor cap (conventional) is sealed in motor vehicles, tampering with the distributor is prevented. The meter in box M comprises the standard mechanism conventional in meters of this type, with the exception of the flag shaft operating mechanism. The conventional meter has a flag connected to the flag shaft by which the shaft is normally operated to set the mechanism in operation. Of course by the employment of this invention the flag is done

away with. Taximeter box M contains shaft 79 (equivalent to the flag shaft of the conventional taximeter) which is attached by suitable gearing (not shown) to the electric motor 80 also contained in box M. One end 81 of shaft 79 has fixed to it two cams 82, 83 (primary and secondary respectively) which cams have cut-out portions 84, 85, respectively. These cams are fixedly arranged on the shaft so that the low portion 85 is slightly in advance of the low portion 84. A switch 86 is mounted within the meter box M and may consist of the stationary members 87, 88 and the two projecting flexible fingers or contact members 89, 90 adapted to be activated by the cams 82, 83. The stationary switch member 87, is connected by means of lead 91 to switch SW at 92. The stationary member 88 is connected through lead 93 to switch SW at 94, while the flexible fingers 89, 90 are connected by means of lead 95 to motor 80. The advance of the low portion 85 with respect to the low portion 84 permits the secondary finger 90 to be in contact with either the switch arms 88 or 87, thereby contacting the arms 88 or 87 before current is passing through the same. As soon as the switch SW will, for example, send the current through 88, the secondary finger 90 will be in contact sufficiently to start the motor. The motor 80 is grounded to the vehicle body as indicated at 96. The ignition switch 78 is connected through lead 97 to the negative terminal of battery B. The positive terminal of battery B is grounded in conventional manner to the vehicle body as indicated at 98. From the negative terminal of the battery B, conductor 99 may lead also to starting motor 100 of the motor vehicle, which motor 100 is controlled by the conventional starting switch 101.

Switch SW has an arm 103 fulcrumed at 104 and connected with the plunger 102 of the solenoid 22. When the solenoid 22 is energized the plunger 102 raises the switch arm 103 from connection 92 to connection 94. When the solenoid 22 is deenergized the switch arm 103 is caused to return to connection 92 under the influence of gravity.

The operation of the above described apparatus is as follows:

A passenger entering the passenger compartment of the taxicab (not shown) having the device A will affect by body capacity the current flow in the device A which will be amplified by means of amplifier P to sufficient strength to operate solenoid 22. Switch SW as illustrated in Fig. 1 is in "no passenger" position. As soon as a passenger enters the taxicab, solenoid 22 will cause plunger 102 to retract thereby moving switch arm 103 from connection 92 to 94. The cams 82, 83 are at this moment positioned such that their low portions 84, 85 cause disconnection of cams 82, 83 from contact with the flexible switch fingers 89, 90 thereby causing said fingers 89, 90 to rest on the stationary switch member 88. Switch 78 is at "on" position. Motor 80 will be put into operation by establishment of the following circuit, namely, positive terminal of battery B, ground connections 98, 96 through motor 80, conductor 95, fingers 89, 90, stationary switch member 88, conductor 93, connection 94, switch arm 103, terminal 104 to switch 78, and thence to conductors 97, 99 to negative terminal of battery B; thereby causing shaft 79 to rotate in the direction of the arrow 105. This will cause the high portions of the cams 82, 83 to engage with the fingers 89, 90 and impel the same upward into contact with the stationary member 87 and thus breaking the circuit, stopping the motor 80 and causing the shaft 79 to stop rotating. The cut-outs 84 and 85 take in substantially 90 degrees of the circumference of the cams 82, 83, respectively, thus giving a ninety degree movement to the taximeter shaft 79 which is equivalent to the change from the "flag up" to the "flag down" position. Since the high portion of cam 82 is behind the high portion of cam 83, finger 89 will maintain contact with member 87 and will not disconnect from member 87 to make contact with member 88 before finger 90 is disconnected from member 88 to make contact with finger 87. It will be remembered that in the conventional arrangement of taximeters, the "flag up" position indicates that the meter is not in operation and that the "flag down" position indicates that the meter is operating. The remaining two hundred and seventy degrees of the circumference of the cam 83 represent the rotative distance the shaft 79 has to travel (after the passenger has left the compartment) to return to its starting position which is equivalent to the conventional meter's "flag up" position. When passenger leaves the cab compartment (fingers 89, 90, being still in contact with stationary switch member 87), switch arm 103 is caused to leave switch terminal 94 and be impelled into contact with switch terminal 92, since the body capacity of the passenger has been removed and the plunger is returned to its normal outward position by spring action (not shown but conventional in solenoids). The following circuit is thus established. Positive terminal of battery B, ground connections 98, 96, through motor 80, conductor 95, fingers 89, 90, stationary switch member 87, conductor 91, connection 92, switch arm 103, terminal 104 to switch 78 and thence to conductors 97, 99 to negative terminal of battery B. The motor 80 will thus be put in operation thus causing shaft 79 to rotate in direction of arrow 105 until the low spots of cams 82, 83 allow the fingers 89, 90 to drop to thereby again engage the stationary switch member 88 and break the circuit between 89, 90 and 87. In case the passenger leaves the cab only temporarily and it is desired to put the meter on a time-registering basis the operator will have to open switch 63 before the passenger leaves the compartment, thereby breaking the circuit through lead 91 into motor 80 and preventing the motor from returning the shaft 79 into a nonregistering position.

In the arrangement shown in Fig. 1 the meter is prevented from registering when the ignition switch 78 is turned off.

If the taxicab operates in localities having more than one tariff, the cams 82, 83 will be substituted by a plurality of cams M*m* having 90° cut-outs *c*, *c'*, *c''*, *c'''* located as shown in Figs. 2 and 3.

Referring now to Figs. 4, 5 and 6, which show the invention in a modified form and as indicated in dotted lines, the wire loops A, as heretofore stated, are positioned within the passenger compartment 20 of a taxicab 21 in such a manner that a person located anywhere within the passenger compartment will be close enough to portions of the loops A to influence said loops by body capacity. This influence is electrically amplified by the amplifier causing operation of solenoid 22 which is connected to main switch SW (Fig. 1). In the diagrammatic view of Fig. 1, one amplifying tube 23 is indicated, but it is understood that the amplifier unit may comprise any number of

electronic tubes or may comprise any conventional amplifying device.

In general the operation of the device as diagrammatically illustrated in Figs. 5 and 6 is in principle similar to the device illustrated in the preferred construction in Fig. 1. The main difference between the two embodiments resides in the construction of the taximeter motor switch, Fig. 1 disclosing the same as being operated by cams mounted on a shaft which cams actuate the spring switch **86**, while Figs. 5 and 6 depict the power supply control to the taximeter motor as suitably insulated spaced plates **54** and **62**, primary and secondary, respectively, and mounted on the shaft **50**. The gap **54'** of plate **54** is equivalent in its function to the lower portion **84** of cam **82** of Fig. 1. Primary plate **54** is wound around shaft **50** leaving the gap **54'** extending a little less than ninety degrees of the circumference of the shaft **50**. Secondary plate **62** is in spaced alinement with gap **54'**, but slightly longer than said gap, covering in length more than ninety degrees of the circumference of shaft **50**. This overlapping of length of plates **62** and **54**, respectively, serves a similar purpose as that of the previously described advancing of the high portion of cam **83** and of high portion of cam **82**, namely, if contact points **53** and **55** have left contact with band **54**, contact points **60** and **61** will be touching the secondary band **62**, thereby assuring a closed circuit when current flows through lead wire **67**.

Stationary contact points **53** and **55** are located for sliding engagement with the plate **54**; and contact points **60** and **61** are located for sliding engagement with the plate **62**. Both said plates are mounted on the rotating shaft **50**. The purpose of plates **54** and **62** is to electrically connect the gap between contact points **53** and **55**, and **60** and **61**, respectively.

Terminal **59** in the amplifying unit P' is connected through conductor **67** to contact point **60**. Terminal **66** is connected through conductor **64** to contact point **53**.

Switch arm **51** is connected to one terminal of battery **52**, the other terminal of said battery connects with one terminal of the taximeter motor **57** through conductor **65**, the other terminal of said motor connecting with contact points **55** and **61**, respectively, through conductor **56**.

The operation of the device as shown in Figs. 5 and 6, follows: Fig. 5 represents diagrammatically the position of shaft **50** with no passenger in the compartment, while Fig. 6 diagrammatically shows the position of shaft **50** when the cab is carrying a fare. Shaft **50** in Fig. 5 is in a rest position but ready to rotate as soon as the coil A becomes influenced by the body capacity of the entering passenger. The amplifier operating the switch arm **51** by means of solenoid **22** (Fig. 1) and bringing the switch arm into the position shown in Fig. 6 at **51'**, thereby connecting point **59** and contact point **60**. As contact points **60**, **61** are in contact with the plate **62** (Fig. 5) and the auxiliary switch **63** is closed, the current is now un-interrupted passing through conductor **56** into the motor **57** and closing the circuit to the battery **52** through the conductor **65**. This will cause the shaft **50** to rotate in the direction of the arrow W. This rotation will be substantially ninety degrees or until the contact points **60**, **61** have left the plate **62**. As the plate **54** slightly overlaps both ends of the plate **62**, the contact points **53**, **55**, will now be resting on plate **54**. The shaft **50** as shown in Fig. 6 is now in a position equivalent to the "flag down" position, which on the conventional cab meter means that the meter is in operation and registering mileage and waiting time. As soon as the passenger leaves the passenger compartment **20**, the switch arm **51'**, (Fig. 6) will return to its original position shown at **51** (Fig. 5). This will connect contact point **53** with the power supply through post **66** and conductor **64**. Plate **54** will connect contact points **53** and **55** thereby sending current through motor **57** and thereby causing shaft **50** to rotate in direction of the arrow W, which rotation will be approximately two hundred and seventy degrees, which is also the length of the plate **54** (plus the overlap portion previously mentioned). The shaft **50** will now have returned to its position shown in Fig. 5 and ready to register again another fare. However, if the passenger left the cab only temporarily, with instruction to the driver to keep the meter running on "waiting time," the operator will break the circuit by opening switch **63**, which will prevent current from reaching the contact point **55**, thereby preventing shaft **50** from returning into its "no passenger position" (which is the "flag-up" position on present taxi-meters). With the standard construction of taximeters which may be employed in connection with this invention the period of absence of the passenger will automatically be registered by the conventional waiting clock.

Figs. 7–10 indicate diagrammatically modifications in the relations of the various parts. In Fig. 7, the motor **125**, meter **126** and amplifier **127** are shown as comprising a single unit. Fig. 8 diagrammatically indicates the motor **125'** and the meter **126'** as a unit, while the amplifier **127'** is shown as detached and connectible to the meter unit by the cable **128**. Fig. 9 illustrates the meter **129** as one unit, while the amplifier **130** and motor **131** form the other unit and connected to the meter by a shaft **132**. Fig. 10 indicates the meter **133**, motor **134** and amplifier **135** as separate units to be suitably located anywhere within the vehicle and in this case the motor **134** is connected to the gears **137** in the meter **133** by means of a flexible shaft **136**.

It is understood that the aforementioned switch SW may be operated mechanically and/or electrically. For example, in lieu of the device A, lever means may be connected with switch SW, which lever may be controlled by the driver on the dash or by the passenger. Fig. 12 shows the lever HS connected to switch arm **103**, for contacting the latter with either terminal **92** or **94**.

Any suitable signal means may be employed to indicate that the meter is or is not in operation while passenger is in the cab. Fig. 12 shows one such signal means in the form of an electric lamp SL, one terminal of which being connected to ground connection and the other terminal being connected to lead **93**. In the drawings the "positive" terminal is shown as being connected to the "ground" of the motor vehicle. Of course, this is merely arbitrary and optional, as in some vehicles the "positive" side of the battery is grounded and in other vehicles, the "negative" side of the battery is grounded.

Fig. 11 shows for simplification, a general, schematic diagram of the various stages of operations involved in the previously described embodiment of the invention shown in Fig. 1. Step A shows the position of switch arms **103** and **89**, **90** when no passenger is in the cab. Step B shows the effect of body capacity of the passenger's prox-

imity to the antenna A of the amplifying unit operating the switch 103, in which case switch arm 103 is automatically thrown to contact terminal 94, thereby establishing a circuit whereby the shaft 79 revolves bringing arms 89, 90 in contact with the contact point 87 when the shaft will cease revolving. The meter will now operate registering fare. Step C shows the phases when the passenger leaves the cab which, because his body capacity is removed, switch arm 103 will automatically return to its original contact position (92), thereby closing the contact through wire 91 with contact point 87 causing motor shaft 79 to revolve and bring the arms 89, 90 in contact with the lower contact point 88; thus the circuit is broken and then the step A condition is again established. The cab is now ready to receive a new passenger to repeat the operations above described. Although the invention is described with reference to the utilization of the body capacity to effect closing and opening of the circuit, it is understood, however, that other means may be employed for the purpose, such as, a light sensitive means, or the known "electric eye" which operates on the principle of opening and/or closing an electric circuit by breaking a light beam cooperating with said contrivance.

While the present invention has been described with relation to a taximeter it is understood that it is not limited thereto but is applicable (with slight changes) to devices, such as, recorders, registers, alarms, etc.

Although the drawings, and the above specification disclose the best modes in which I have contemplated embodying my invention, I desire in no way to be limited to the details of such disclosure, for in the further practical application of my invention many changes in the forms and proportions may be made as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. A device of the character described comprising in combination with a flagless taximeter mounted on a vehicle, a taximeter shaft having predetermined positions in which the taximeter is made operative and inoperative respectively, an electric motor driving said taximeter shaft, controlling means adapted for controlling said motor for alternately positioning said taximeter shaft to said operative and inoperative positions of said taximeter, said controlling means including an electric switch having two positions the first of which closing a first circuit for starting said motor to turn said shaft from an inoperative position of said taximeter to an operative position thereof, the second position of said switch closing a second circuit for starting said motor to turn said shaft from an operative position of said taximeter to an inoperative position thereof, switch operating means effective for causing said switch to move from said second position to said first position, and means for causing return of said switch from its first position to its second position when said operating means become ineffective, said switch operating means being effective when and as long as a passenger is within said vehicle, and including a device adapted to be actuated by body capacity.

2. A device of the character described comprising in combination with a flagless taximeter mounted on a vehicle, a taximeter shaft having predetermined positions in which the taximeter is made operative and inoperative respectively, electrical actuating means including an electric motor connected with said taximeter shaft for turning same, controlling means adapted for automatically controlling said actuating means to turn said taximeter shaft respectively to said operative position when a passenger enters the vehicle, and to said inoperative position when said passenger leaves the vehicle, and means operable by the driver of the vehicle adapted for causing said taximeter shaft to remain in said operative position even when no passenger is within the vehicle.

3. A device of the character described comprising in combination with a flagless taximeter mounted on a vehicle, a taximeter shaft having predetermined positions in which the taximeter is made operative and inoperative respectively, an electric motor driving said taximeter shaft, controlling means adapted for controlling said motor for alternately positioning said taximeter shaft to said operative and inoperative positions of said taximeter, said controlling means including an electric switch having two positions the first of which closing a first circuit for starting said motor to turn said shaft from an inoperative position of said taximeter to an operative position thereof, the second position of said switch closing a second circuit for starting said motor to turn said shaft from an operative position of said taximeter to an inoperative position thereof, switch operating means effective for causing said switch to move from said second position to said first position, means for causing return of said switch from its first position to its second position when said operating means become ineffective, said switch operating means being effective when and as long as a passenger is within said vehicle, and a manually operable switch in said second circuit.

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