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2,015,961

ELECTRICALLY OPERATED FLAG SHAFT THROWING MECHANISM

Filed June 19, 1931

3 Sheets-Sheet 1

FIG. 2.

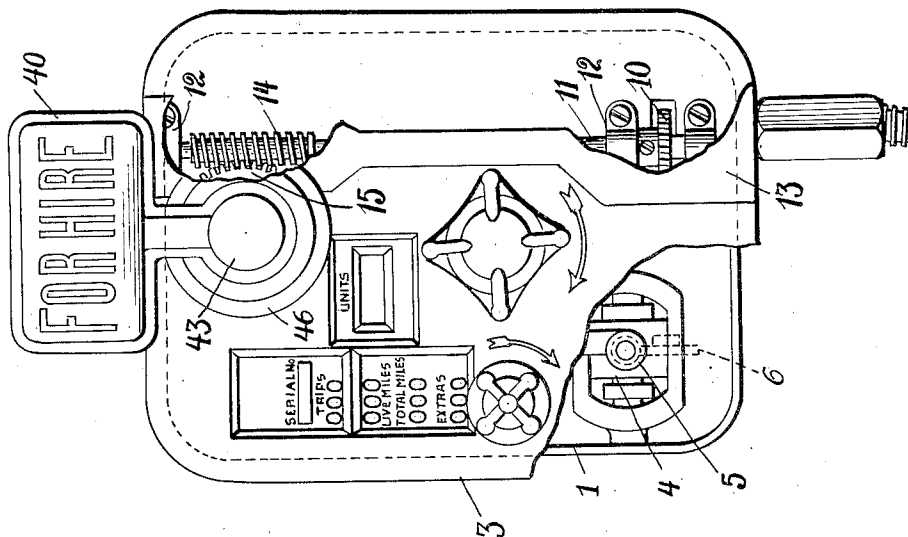
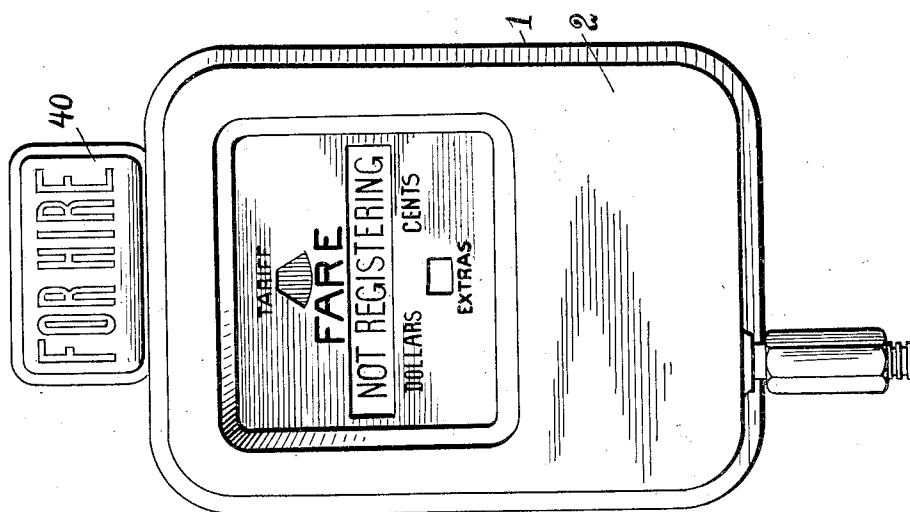


FIG. 1.



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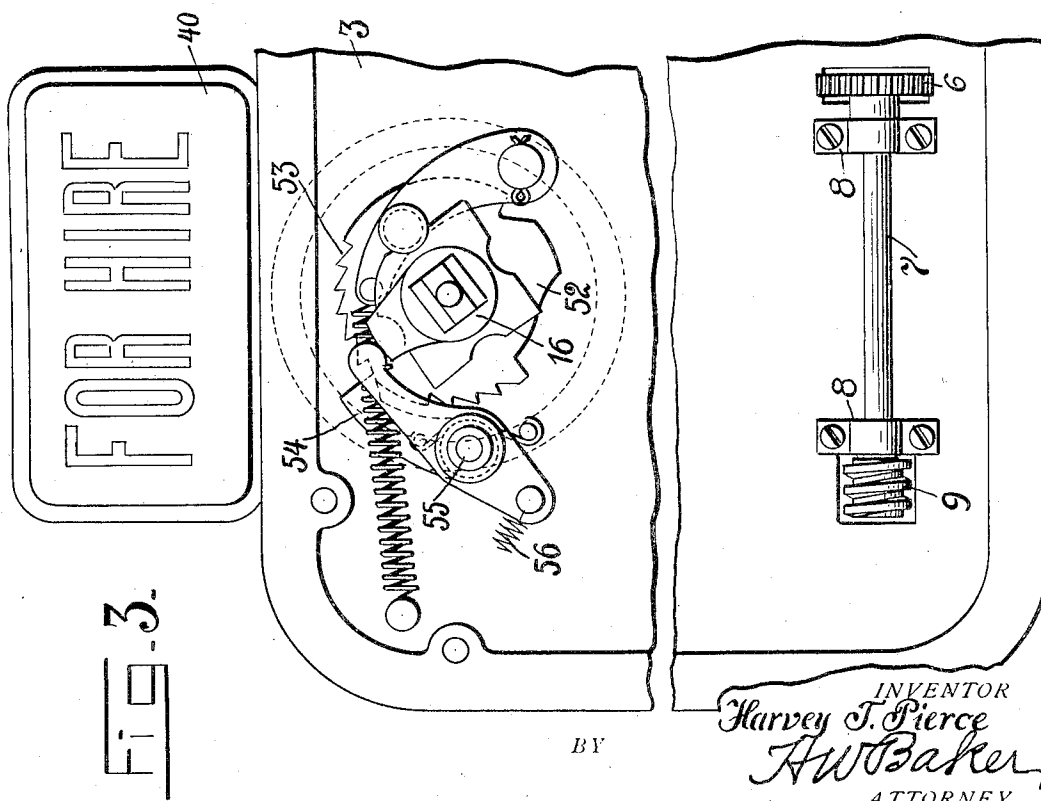
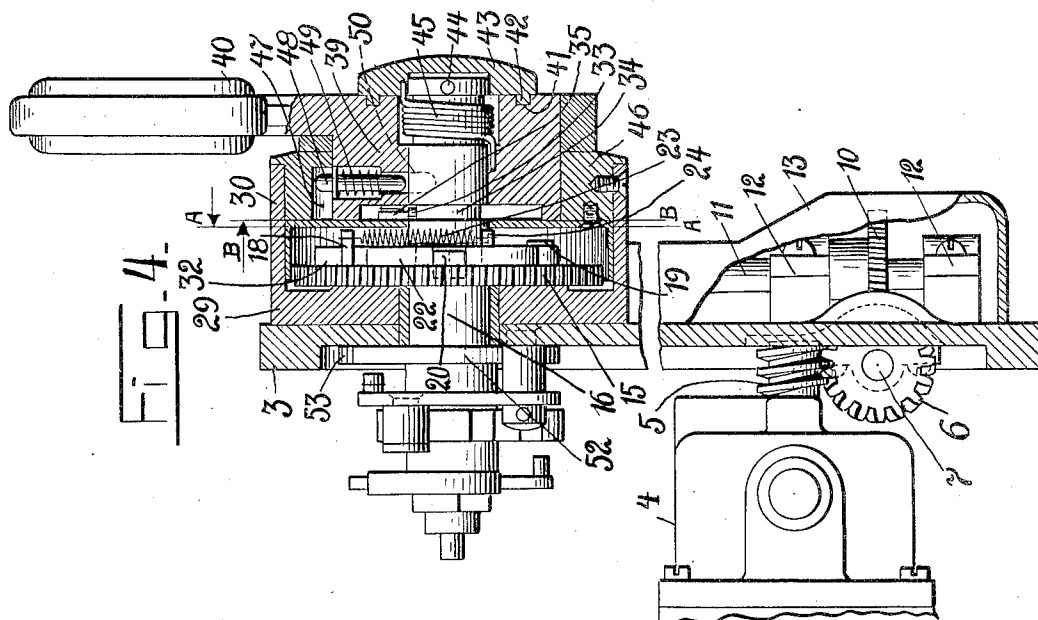
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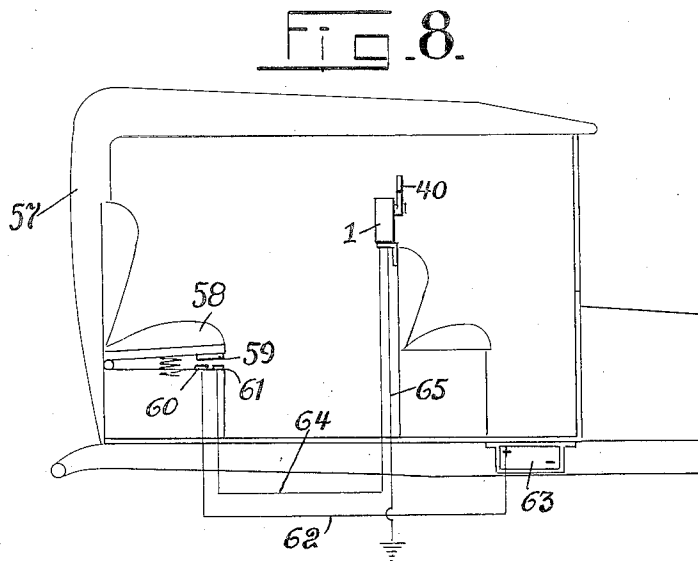
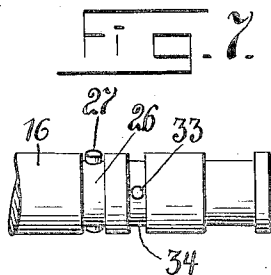
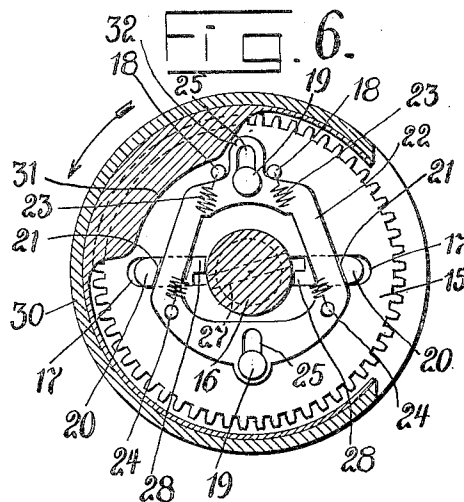
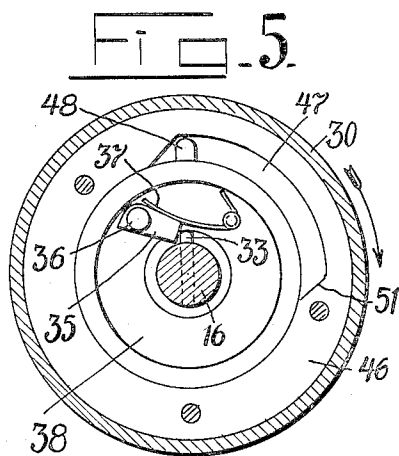
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ELECTRICALLY OPERATED FLAG SHAFT THROWING MECHANISM

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,015,961

ELECTRICALLY OPERATED FLAG SHAFT
THROWING MECHANISM

Harvey T. Pierce, Dayton, Ohio, assignor, by
mesne assignments, to Central United National
Bank, Cleveland, Ohio, as trustee

Application June 19, 1931, Serial No. 545,529

8 Claims. (Cl. 235—30)

Operators of fleets of taxicabs have, for a long period of time, realized that there was more or less so-called "high flagging" by the drivers. By "high flagging" is meant that the driver carries a passenger without throwing the taximeter flag which would place the taximeter into operation. The driver fails to throw the flag with the intention of defrauding the operating company by pocketing the money collected.

Various attempts have been made to prevent this evil by providing means which would cause the flag to be thrown into operative position when the passenger takes his seat, such as, for instance, to short circuit the motor and one patent shows mechanical means consisting of a series of complicated levers whereby the flag is thrown to its 90 degree position when the passenger takes his seat but no means is shown in the said patent whereby the flag could be made to complete its revolution of 360 degrees for the said levers would prevent such a move. It has also been proposed to provide a solenoid which when the passenger would take his seat would release a catch and a spring would throw the flag to its 90 degree position. So far as known, however, none of these patents or proposals show any means whereby the flag shaft is automatically thrown to its 90 degree position and at the same time provided with means which would permit the complete rotation of the flag shaft through 360 degrees. The object of this invention is to accomplish this result. Another object of this invention is to provide means whereby in case the automatic means should fail, the flag could be manually thrown to its 90 degree position and could be manually returned to its home position by completing the rotation through 360 degrees. Other objects of the invention will appear in the detailed specification and claims.

In the drawings:

In Figure 1 I have shown the front of a conventional taximeter.

Figure 2 is a rear elevational view thereof.

Figure 3 is a view of the inside of the back plate of the taximeter.

Figure 4 is an elevational view, partly in cross-section, through the back plate showing the flag shaft, the parts mounted thereon and certain parts of the driving mechanism for the flag shaft.

Figure 5 is a view, partly in cross-section, on the line B—B of Figure 4 looking in the direction of the arrow.

Figure 6 is a view, partly in cross-section, on

the line A—A of Figure 4 looking in the direction of the arrow.

Figure 7 is a fragmentary view of a portion of the flag shaft.

Figure 8 is a diagrammatic view of the electrical wiring system employed.

In the drawings the taximeter casing 1 is provided with a front plate 2 and a back plate 3. Behind the front plate 2 are the conventional tariff readings to show the amount of fare registered. A motor 4 is secured within the lower part of the machine, which motor is of a conventional type which requires no particular description, whereby after driving a pre-determined amount it is automatically cut off. The means whereby the motor circuit is broken at the end of a cycle forms no part of the present invention and is not herein disclosed. In an application filed contemporaneously herewith by Grover C. Coil, Serial No. 545,542, which covers certain features disclosed herein, is shown a means for this purpose. This motor drives a worm 5 which meshes with and drives a worm gear 6 secured to a shaft 7 mounted on the back plate 3 by means of bearings 8. The shaft 7 also carries a worm 9 which meshes with and drives a worm gear 10 secured to a shaft 11 supported on the back plate 3 by means of bearings 12. A cover 13 may be provided attached to the back plate 3 to house the shaft 11 and parts mounted thereon. The shaft 11 is provided with a worm 14 which meshes with and drives a gear 15 rotatably mounted on the flag shaft 16. The motor is of such a design that when the gear 15 has been driven for 360 degrees it is automatically cut off.

The gear 15 is provided with two radially extending slots 17, two stop pins 18 and two guide pins 19. Two sliding pawls 20 lie within the slots 17, the two said pawls being exact duplicates of each other and each of which is provided with a channel way 21. These channel ways are not parallel to each other but extend at an angle to each other as shown in Figure 6. Within these channel ways extend arms of a pawl operating slide 22, the upper movement of which is stopped by the pins 18, the said slide 22 being normally held against the pins 18 by means of springs 23 secured to the said pins and to pins 24 carried by the said slide. The said slide is also provided with slots 25 through which extend the guide pins 19. The flag shaft 16 is provided with a circular channel 26 and a pin 27 extends through the shaft and into the opposite parts of the channel 26, stopping it at a point approximately in alignment with the circumference of the shaft.

The pawls 20 are so positioned relative to the said shaft that when the pawls are pushed inwardly their ends 28 will extend within the said channel so that they may engage the ends of the pin 27. A plate 29 is secured to the back plate 3 and extends outwardly forming a cylinder 30. Secured to this cylinder 30, which, of course, is stationary, is a cam plate 31 which extends for a distance so that when the motor drives the shaft 16 the upper end 32 of the slide 22 will be depressed by the said cam plate thereby causing the pawls 20 to be moved inwardly so that their ends 28 extend within the channel 26 and engage the ends of the pin 27 and when the said shaft 16 has thus been rotated for 90 degrees the end 32 will pass beyond the cam plate 31 and the springs 23 will move the upper end 32 of the slide 22 outwardly thereby disengaging the pawls 20 from the pin 27. The motor will continue to run, however, until the gear 15 has completed its 360 degrees of rotation, which will bring it back into the position shown in Figure 6. It is, therefore, obvious that when the motor has been operated the gear 15 will be driven for 360 degrees and by the means above described the flag shaft will automatically be moved from its zero or home position to its 90 degree or operating position, at which point the driving connection between the gear 15 and the flag shaft 16 will be broken and no motion will be imparted to the flag shaft 16 on the last 270 degrees of the rotation of the gear 15.

If for any reason the motor should fail to operate, the driver should still be under the responsibility of throwing the flag manually and to this end I have provided a pin 33 extending through a circular groove 34 in the flag shaft, which pin is normally engaged by a pawl 35 mounted on a pin 36 and pressed inwardly by means of a spring 37. The pin 36 is carried by a disk 38 carried by the hub 39 of the flag 40. If the operator rotates the flag 40 and disk 38 in the direction of the arrow shown in Figure 5, the pawl 35 carried by the said disk will engage the pin 33 and rotate the flag shaft 16 therewith. It is, therefore, apparent that the flag may be thrown into its 90 degree position either manually or by the operation of the electric motor.

The hub 39 of the flag 40 is not secured to the flag shaft 16. The hub 39 is provided with a circular channel 41 into which extends a circular tongue 42 carried by a cap plate 43 which is secured to the flag shaft 16 by means of a pin 44. A spring 45 has one end secured to the hub 39 of the flag 40 and the other end embedded in the cap plate 43. This spring is provided so that if a dishonest driver of a taxicab should place a block of wood or other obstruction in the path of movement of the flag so that the flag would be held immovable, when the motor operated the motor would still rotate the flag shaft 16 for 90 degrees against the tension of the spring 45. If now the block of wood were removed, the spring would throw the flag from its zero or home position to its 90 degree position but such movement would impart no movement to the flag shaft. The operator would have accomplished nothing whatsoever, therefore, by his attempted fraudulent manipulation.

A circular plate 46 is secured to the cylinder 30, which circular plate is, therefore, stationary. It is provided with a cut-away portion 47 (Figure 5) which extends for approximately 90 degrees. A pin 48 extends within the cut-away portion

and is manually pressed outwardly by means of a spring 49. The lower portion of the pin 48 will extend within a well 50 extending radially inwardly in the shaft 16. Regardless of whether the flag shaft is moved to its first 90 degree position manually or automatically, the said pin 48 will simply move within the cut-away portion 47. When, however, the operator moves the flag from its 90 degree to its 180 degree position, the said pin 48 will engage the stationary cam surface 51, 10 which is a part of the circular plate 46, camming the said pin inwardly so as to project the inner end of the pin into the well 50 and thereby locking the flag to the flag shaft. This locking engagement continues from the 90 degree position 15 to the 360 degree position. The operator can, therefore, throw the flag from the 90 degree position to the 180 degree position or the 270 degree position and can then reversely move the flag to any other position up to and including the 90 20 degree position. The operator should not, however, move the flag reversely from its 90 degree position to its zero position and if he could do this it might appear that the flag was in its zero or "For Hire" position when the flag shaft 25 had not completed its full rotation and it had, therefore, not performed the functions which are usually performed by a flag shaft, such as controlling the resetting of the fare drums. In Figure 3 I have shown a disk 52 secured to the flag shaft 16. On this disk are ratchet teeth 53 which may be engaged by a pawl 54 mounted on a stud 55 and normally held in engagement with said teeth by means of a spring 56. When the flag has rotated clockwise, as viewed in Figure 3, the said pawl 54 over-rides the ratchet teeth and prevents retrograde movement of the flag. When the flag shaft has reached its 90 degree position the ratchet teeth will have passed beyond the pawl 54 and there are no more ratchet teeth up 40 to and including the 270 degree position of the flag shaft so that there is nothing to prevent the retrograde movement of the flag shaft from its 270 degree position to its 180 degree position or its 90 degree position but as soon as the flag 45 shaft has passed beyond its 270 degree position the pawl 54 will again be adjacent the ratchet teeth 53. By this means the operator is prevented from doing anything with the flag but move it to its home position after it has passed its 270 degree position.

In Figure 8 I have shown an outline of a taxicab 57 having a hinged seat 58 carrying a contact 59, which when the seat is depressed will engage contacts 60 and 61. A lead 62 connects the battery 63 to the contacts 60 and a lead 64 connects the contacts 61 to the electric windings of the motor 4. A lead 65 extends from the motor to the ground. The seat 58 is normally held elevated so that the contact 59 will not be in engagement with the contacts 60 and 61 and the circuit will, therefore, be broken unless the said seat is depressed by a passenger sitting thereon. Of course, it will be understood that these contacts could be operated by the floor board or by 65 the extra seats that are usually in a taxicab, or anywhere desirable.

I realize that many changes may be made in the specific form of invention shown by way of illustration in this application and I, therefore, 70 desire to claim the invention broadly except as I may limit myself in the appended claims.

Having now described my invention, I claim:

1. In a taximeter, a motor, a flag shaft, a gear loosely mounted on said flag shaft and adapted 75

to be driven by said motor, means whereby said gear is automatically connected to said flag shaft so as to rotate said flag shaft to its operative position, and manual means whereby said flag shaft 5 may be caused to rotate in the same direction to its home position.

2. In a taximeter, a motor, a flag shaft, a rotatable means mounted on said flag shaft, means whereby said rotatable means may be rotated by 10 said motor, means to connect automatically said rotatable means to said flag shaft so as to cause said flag shaft to be rotated to its operative position, and manual means whereby said flag shaft may be caused to rotate in the same direction to 15 its home position.

3. In a taximeter, a motor, a flag shaft, a gear rotatably mounted on said flag shaft, means whereby said gear is driven by said motor, means to automatically connect said gear to said flag 20 shaft when said gear is rotated so as to move said flag shaft from its "For Hire" position to its operative position, means to automatically disconnect said gear from said flag shaft when the said flag shaft has been moved to its operative position, and manual means whereby said flag shaft 25 may be rotated in the same direction to its home position.

4. In a taximeter, a motor, a flag shaft, a gear rotatably mounted on said flag shaft, means whereby said gear is driven by said motor, means whereby said gear is connected to said flag shaft 30 until said flag shaft has been rotated to a predetermined extent, said means including a slide, means whereby said slide may be actuated, pawls governed by said slide, and means carried by said 35 shaft to be engaged by said pawls during the initial operation of said flag shaft.

5. In a taximeter, a flag shaft, a gear loosely mounted thereon and provided with radially ex-

tending channel ways, pawls slidably mounted in said channel ways, a slide carried by said gear and controlling said pawls, means carried by said shaft adapted to be engaged by said pawls when 5 said pawls are in one position, means to operate said slide to cause said pawls to engage the said means carried by the flag shaft to cause the flag shaft to be operated by the operation of the gear, and means to operate said slide so as to disengage the pawls from the said means carried by 10 the flag shaft so as to disengage the said gear from its driving engagement with the flag shaft.

6. In a taximeter, a flag shaft provided with a well, a flag rotatably mounted on the flag shaft, a stationary disk, a cam forming a part thereof, 15 and a pin carried by said flag and adapted to be engaged by said cam after said flag has rotated to a pre-determined extent so as to project said pin within said well and lock said flag to said flag shaft. 20

7. In a taximeter, a flag shaft, a gear loosely mounted thereon and provided with radially extending channel ways, pawls slidably mounted in said channel ways, a slide carried by said gear and controlling said pawls, means carried by said 25 shaft adapted to be engaged by said pawls when said pawls are in one position, and means to operate said slide to cause said pawls to engage the said means carried by the flag shaft to cause the flag shaft to be operated by the operation 30 of the gear.

8. In combination, a flag shaft, a flag rotatably mounted on said shaft, a spring resiliently connecting said flag and flag shaft, a projection carried by said flag shaft, and a pawl connected 35 to said flag and adapted to engage said projection to rotate said shaft.

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