(No Model.)

O. SCHNEIDER.

FARE INDICATOR FOR CABS.

No. 519,972. Patented May 15, 1894.

Fig. 4.

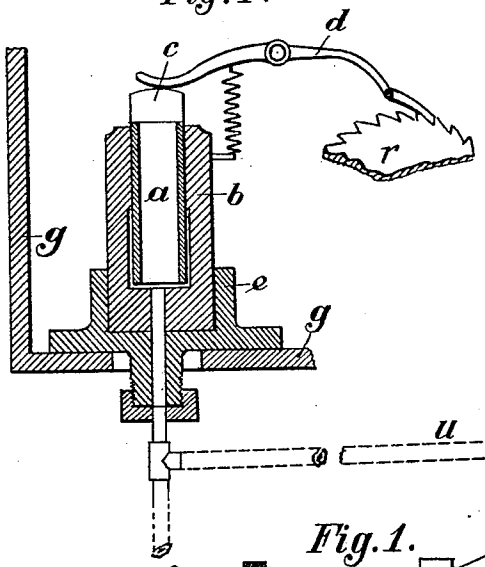


Fig. 3.

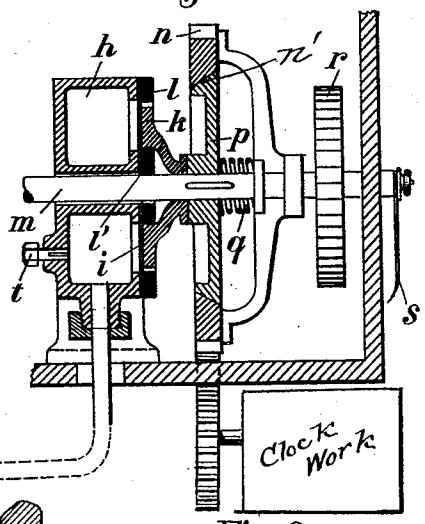
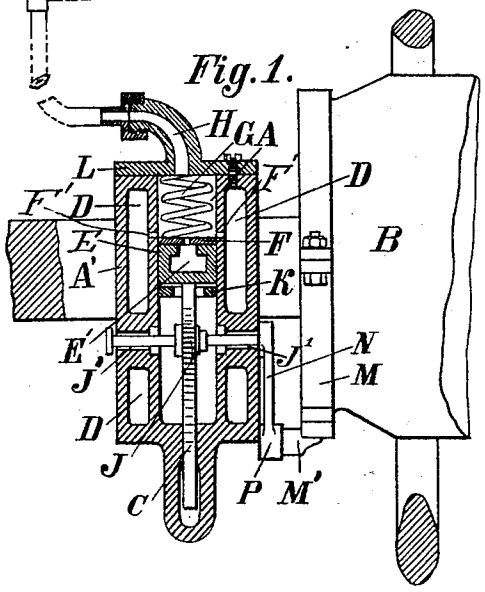


Fig. 2.

Fig. 1.



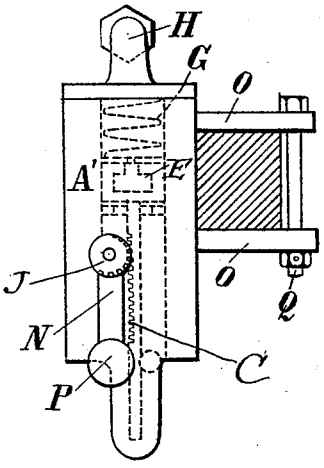


Fig. 5.

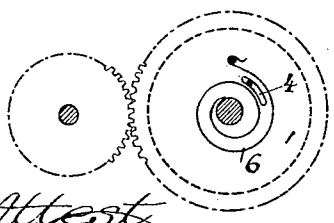


Fig. 6.

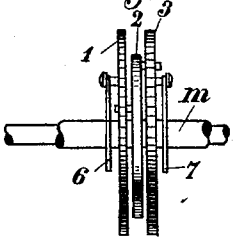
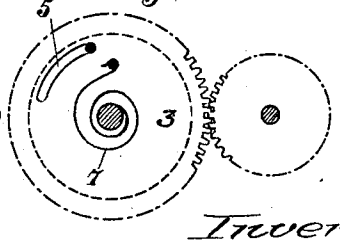


Fig. 7.



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UNITED STATES PATENT OFFICE.

OTTO SCHNEIDER, OF BERLIN, GERMANY.

FARE-INDICATOR FOR CABS.

SPECIFICATION forming part of Letters Patent No. 519,972, dated May 15, 1894.

Application filed August 8, 1893. Serial No. 482,684. (No model.)

To all whom it may concern:

Be it known that I, OTTO SCHNEIDER, engineer, of 50 Rüdersdorferstrasse, Berlin, in the Empire of Germany, have invented new and useful Improvements in Fare-Indicators for Cabs and other Like Conveyances, of which the following is a specification, reference being had therein to the accompanying drawings.

The present invention relates to improvements in devices for ascertaining or indicating the amount to be charged for cabs and other like conveyances by means of which those disadvantages are obviated which have attended the employment of the apparatus of this description as heretofore constructed. And in order that my said invention may be fully understood I shall now proceed more particularly to describe the same and for that purpose shall refer to the several figures on the annexed sheet of drawings the same letters and figures of reference indicating the same or corresponding parts in all the figures.

Figure 1 of the accompanying drawings illustrates in section the air pump cylinder and mechanism for actuating the air pump by means of the nave of the vehicle. Fig. 2 represents the said air pump and mechanism in side elevation. Fig. 3 illustrates in section the connecting mechanism between the time and distance indicators. Fig. 4 represents in section a device employed in transmitting motion to the indicator. Figs. 5, 6 and 7 illustrate a detail hereinafter referred to.

The invention relates in the first place to an improved arrangement of the air pump which is attached to the axle in a vertical position in place of in the horizontal position in which it has heretofore been placed. The air pumps as heretofore arranged allow water to enter the small pipe or tube leading to the indicator operating devices especially when a considerable amount of moisture is present in the atmosphere which water is liable to freeze in the pipes in cold weather and stop the working of the parts. To obviate this disadvantage the pump cylinder A is arranged vertically upon the axle as represented in Figs. 1 and 2 and is provided with a piston E formed with a hollow space or chamber E′ in which the moisture from the air is deposited and prevented from passing into the tubes. A hygroscopic material or substance such as chloride of calcium may be placed in the chamber E′, if required for the purpose of absorbing the moisture in the air. The chamber E′ is moreover provided with means (not shown in the drawings) for drawing off from time to time the water accumulated therein. The air pump cylinder A is inclosed in a jacket or casing A′ inclosing a space D between the cylinder and casing which acts as an air chamber.

F′ are air inlet orifices and H is a delivery passage formed in a head L screwed to the end of the cylinder.

Two lugs or projections O serve to enable the air pump to be attached to the axle by means of a bolt and nut Q.

The piston E reciprocates vertically in the cylinder and is provided with an elastic disk F of a diameter somewhat greater than the cylinder which assists in preventing leakage. The descent of the piston is produced by the action of a spring G and is limited by the piston coming in contact with a partition K provided in the interior of the cylinder. The piston is attached to a piston rod C the lower extremity of which works in guides provided at the lower extremity of the pump cylinder the intermediate part being in the form of a toothed rack gearing with a toothed or partially toothed wheel J on a spindle working in bearings J′ in the sides of the cylinder. One extremity of this spindle is provided with an arm N carrying a weight P which assists the action of the spring G being so adjusted as to cause the arm N to tend to assume a vertical position and draw down the piston.

A ring or cap M is placed on the nave B of the wheel and is provided with a pin or tappet M′ which as the wheel of the vehicle rotates comes in contact with the lever arm N and causes it to elevate the piston and force air through the passage H. The connection between the toothed wheel J and its spindle is so arranged that the pump works during the forward movement of the vehicle only but does not work when the vehicle moves backward.

The pulsations produced by the difference in the pressures in the air pump cylinder on the ascent and descent of the piston are transmitted through tubes connected to the deliv-

ery passage H to the device represented in Fig. 4 forming the driver which actuates the indicating mechanism as hereinafter described. This device comprises a plate *e* screwed to the casing *g* and supporting a cylinder *b* in which reciprocates a hollow air tight piston *a*. This piston is operated by the pulsations produced by the piston E in the air pump before described, as it will be readily observed that every time the piston in the air pump is raised the air will be forced out through the pipe H into cylinder *b* raising the piston *a*, and the downward movement of the piston in the air pump will withdraw the air and allow the piston *a* to return to normal position. The piston *a* is provided at its upper end with a metallic head *c* forming a bearing upon which rests one end of a spring pressed lever *d*. The other end of this lever *d* is connected by any suitable pawl and ratchet mechanism with the indicating mechanism and by its rocking movement operates the said mechanism step by step while the vehicle is in motion.

The driving device arranged as hereinbefore described presents important advantages compared to the cylinder provided with a diaphragm as heretofore employed and which ceases to act properly after working for a relatively short time.

An important disadvantage connected with the fare indicators heretofore employed is that their indications of the fares for time and distance are not to be depended upon. A fare indicator is required to indicate the fare according to a given scale or tariff so long as the vehicle is used for traveling and must indicate according to another scale the time during which the vehicle is not used by the hirer for traveling but is stopped owing to a block in the traffic for example. The apparatus consequently is provided with a distance scale or tariff and a time scale or tariff and must comply with the following conditions namely:—First. The time indicator or meter which consists of an ordinary clockwork movement must come into action directly the vehicle stops. Second. The said indicator or meter must cease to act directly the speed of the vehicle is sufficient to enable the fare to be calculated according to a higher tariff than the time tariff. Third. The time indicator must again come into action immediately on the speed of the vehicle being reduced to such an extent that the distance indicator falls behind the time tariff. In order to accomplish this result I provide a pointer mounted upon a shaft and traveling over a suitable dial or indicating plate graduated as required. The shaft is designed to be operated by the pulsating mechanism before described as long as the vehicle is in motion, but should it come to a stand still, or the speed be reduced below a certain rate, a suitable clock mechanism is brought into action, as hereinafter described, to rotate the pointer at a uniform rate of speed, this speed being slower than that caused by the travel of the vehicle. By this means the pointer will indicate the total amount to be charged and this amount will be greater or less according to the speed of the vehicle as hereinafter described. This mechanism is illustrated in Fig. 3 in which the shaft is shown at *m* and the pointer at *s*. A wheel *r* mounted rigidly on this shaft and connected by the pawl and ratchet mechanism before referred to, to the rocking lever *d* causes the pointer to be rotated as long as the vehicle is moving above a certain rate of speed.

In order to provide for the rotation of the shaft independent of the rocking lever *d*, the clock mechanism is provided with means for automatically throwing such mechanism into and out of operative connection with the shaft *m*. This means comprises a cylinder *h* mounted in the casing and connected by a branch pipe *u* to the air pipe H. A suitable valve (not shown) permits the air to enter the cylinder *h* but prevents its return through the pipe *u*. At one side of the cylinder is located a flexible diaphragm *i* which expands under pressure from the air within the cylinder and bears laterally upon a collar *h*. A wheel *n* which is connected to and driven continuously by the clock mechanism, has an interior clutching face *n'* adapted to be normally in engagement with the periphery of a bevel edged wheel or disk *p* splined upon the shaft *m* and having movement longitudinally thereof. A spring *q* keeps the wheel *p* pressed normally toward the left, and thus in the absence of any positive force, the clutching faces will be in contact, and the clock mechanism will drive the shaft. This is always the case when the vehicle is at a standstill or moves below a predetermined rate of speed. Supposing, however, the vehicle to move at a rate of speed requiring the pointer *s* to move faster the air pump forces a portion of the air out through the branch pipe into the cylinder *h* and expands the diaphragm, causing the collar to be moved to the right and through its connecting arms to force the wheel *p* to the right against the pressure of the spring, removing their clutching faces from contact with each other and throwing the clock work out of connection and, as the operation of the air pump which sends the air into the cylinder *h* also sends pulsations into cylinder *b*, the pointer will be operated by the latter instead of the clock work. As the air which enters the cylinder *h* is prevented from returning through the pipe *u*, it is necessary to provide a relief valve or outlet and this may be done by means of a port closed by a slotted screw *t* so that the size of the outlet may be varied by adjusting the screw in or out as desired. It will be seen that by means of the set screw *t* the port may be adjusted so that as soon as the speed of the vehicle is reduced to a low rate, as for example, a walking pace, the air will escape sufficiently rapid to prevent press-

ure enough being maintained in the cylinder to force the diaphragm outward against the pressure of the spring. The driving mechanism for the wheel *r* is so arranged as not to interfere with the movement of the spindle *m* when under the influence of the clock.

Fare indicators of this class as heretofore constructed present the defect that the driver of the vehicle in starting the apparatus by striking the controlling lever of the indicator with sufficient force is enabled to influence the latter to the disadvantage of the hirer and cause the apparatus to indicate a larger sum than that corresponding to the minimum fare payable. In order to obviate this—that is to say in order to render the indicating mechanism incapable of being tampered with in this manner—the following arrangement is employed namely. In place of the toothed wheel *r*, Fig. 3, a series of three disks 1, 2, 3 is employed, as represented in Figs. 5, 6, and 7, being so arranged that the disk 1 is driven by the apparatus for measuring distance and the disk 3 is driven by the apparatus for measuring time. These two disks 1 and 3 are free to rotate upon the spindle *m* but the intermediate disk 2 is fixed upon the said spindle. The two disks 1 and 3 are provided with concentric slots or recesses marked 4 and 5 respectively as represented in Figs. 5 and 7 engaging with pins attached to the disk 2. It is evident that by these means the disks 1 and 3 can be connected to the spindle *m* but this connection does not take place until after the two disks have been rotated through an angle corresponding to the length of the concentric slots so that the pin is brought in contact with the end of the said slot. Now in order to understand the action of this arrangement it must be supposed that the apparatus is adjusted for the primary or minimum fare at the commencement of the journey. The clock and distance meter both work while the vehicle is in motion but the pointer will be caused to travel slowly and indicate the primary or minimum fare until one of the two slots 4 or 5 influences the rotation of the spindle *m*. From the foregoing explanation it will be readily understood that the pointer will be caused to travel at a faster or slower rate according to the speed of the vehicle in relation to the rotation of the spindle *m*.

At the conclusion of the journey the two disks 1 and 3 are automatically moved back into the original or starting position by the action of two springs 6 and 7 (Figs. 5 and 6) directly the apparatus is put out of action by the controlling lever.

What I claim, and desire to secure by Letters Patent, is—

1. In combination with a vehicle an air cylinder carried by the axle thereof, a spring pressed piston reciprocating therein having a toothed piston rod, a shaft carrying a gear engaging said toothed rod, a crank arm carried by said shaft adapted to be engaged by a projection on the wheel hub to propel said piston against the pressure of the spring, a supplemental cylinder and piston having pipe connections with the first, and a shaft carrying suitable indicating mechanism and operatively connected to said supplemental piston, substantially as described.

2. In combination with a vehicle, a vertically arranged cylinder mounted upon the axle and having pipe connections to a supplemental indicator-operating cylinder, and a piston reciprocating in said main cylinder operated by the vehicle wheel, said piston having a recessed upper face to provide a receptacle for gathering moisture which condenses within the cylinder, substantially as described.

3. In combination with a vehicle, a vertically arranged cylinder mounted on the axle thereof and having pipe connections to a supplemental indicator-operating cylinder, a piston reciprocating in said cylinder and adapted to be intermittently raised by the vehicle wheel, said piston having a recessed upper face, perforated elastic disk resting upon the upper face of the piston and forming a packing, and a helical spring extending between said disk and the upper end of the cylinder and serving to return the piston after it has been raised by the wheel, substantially as described.

4. In combination with a vehicle an air cylinder connected to the axle thereof, and having a piston operated by the vehicle wheel, a supplemental cylinder having pipe connections with said first cylinder, a piston in said supplemental cylinder caused to reciprocate by the pulsations produced by the first piston, a shaft carrying a suitable indicator operated by said second piston and a continuously driven mechanism adapted to be automatically connected with said shaft when the movement of the vehicle is reduced below a predetermined speed, substantially as described.

5. In combination with the cylinders A and *b* having a pipe connection and the pistons reciprocating in unison therein, an indicator shaft operated by the piston in cylinder *b*, a third cylinder having a flexible side wall connected through a branch pipe with the cylinder A, said branch pipe being adapted to admit air to said third cylinder but preventing its return therefrom, a continuously driven wheel loose on the indicator shaft, a sliding clutch disk held normally in contact with said wheel, a connection between said flexible wall and clutch disk whereby pressure within the cylinder will expand said flexible wall and disengage the disk and wheel, and a relief valve for permitting the escape of excess of air, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

OTTO SCHNEIDER.

Witnesses:
PAUL FISCHER,
JOHN SATOWSKI.