C. W. MALLINS.

INDICATOR FOR TRAMCARS AND THE LIKE FOR INDICATING STATIONS OR STOPPING PLACES.

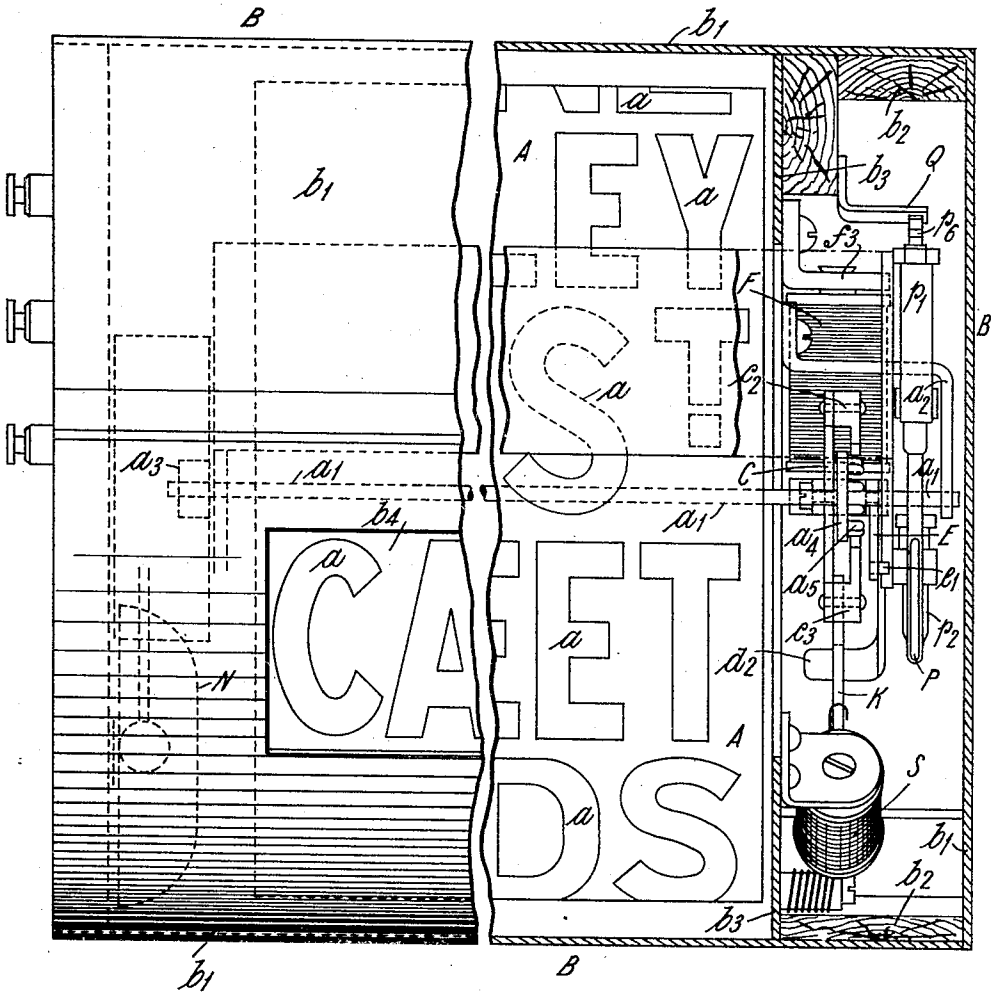
APPLICATION FILED MAR. 26, 1917.

1,330,887.

Patented Feb. 17, 1920.

3 SHEETS—SHEET 1.

FIG. 1.



Inventor
Charles W. Mallins,
Dyer Holcombe Arnoldson & Dyer
Atty's.

C. W. MALLINS.

INDICATOR FOR TRAMCARS AND THE LIKE FOR INDICATING STATIONS OR STOPPING PLACES.

APPLICATION FILED MAR. 26, 1917.

1,330,887.

Patented Feb. 17, 1920.

3 SHEETS—SHEET 2.

FIG. 2.

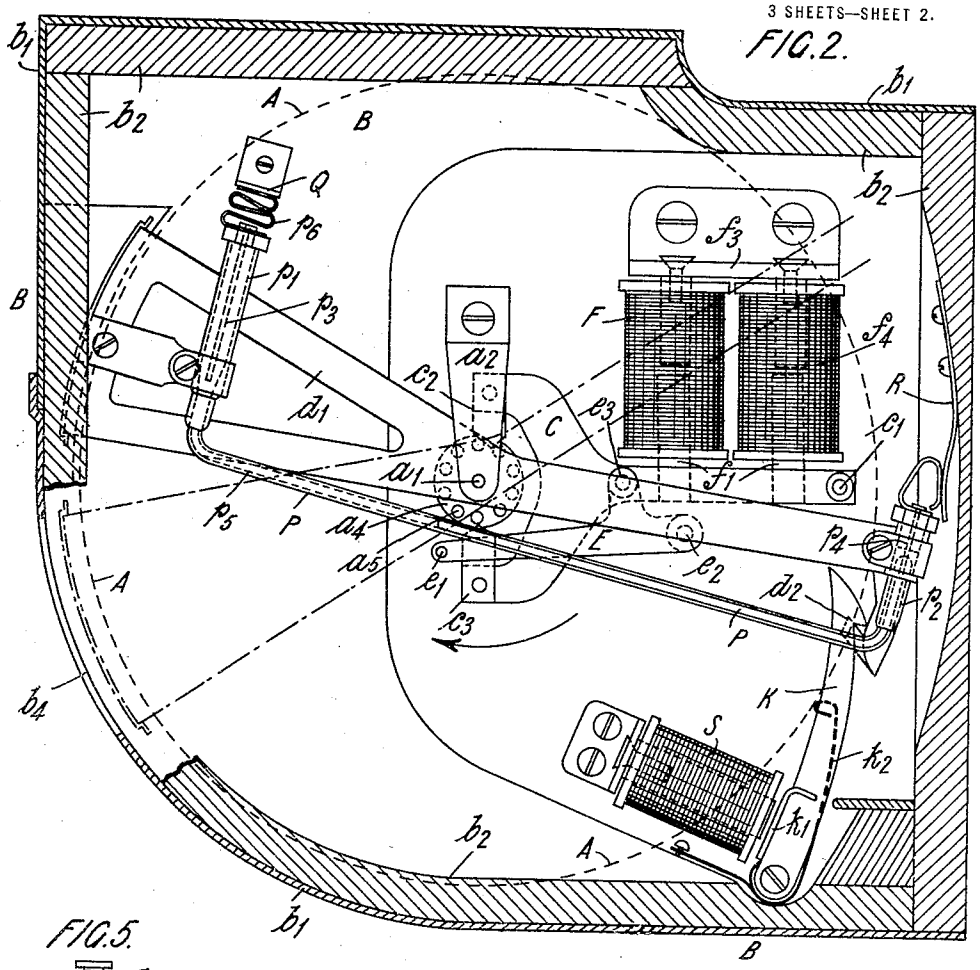


FIG. 5.

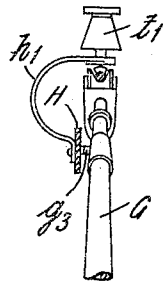


FIG. 4.

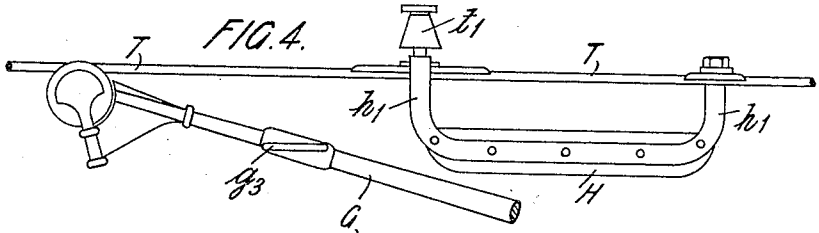


FIG. 6.

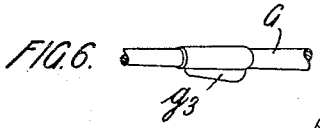
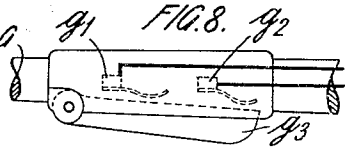


FIG. 7.

FIG. 8.



Inventor:
Charles W. Mallins,
Spear Middleton Donaldson & Spear
Atty's.

C. W. MALLINS.

INDICATOR FOR TRAMCARS AND THE LIKE FOR INDICATING STATIONS OR STOPPING PLACES.

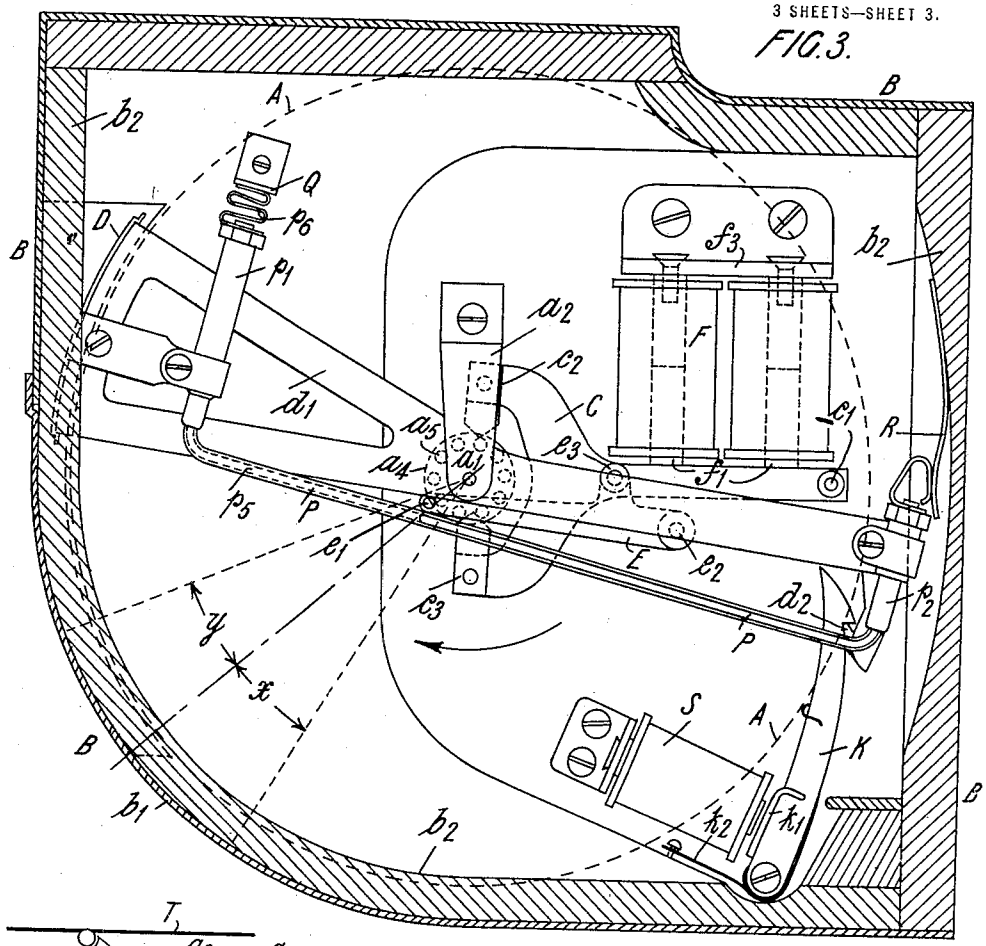
APPLICATION FILED MAR. 26, 1917.

1,330,887.

Patented Feb. 17, 1920.

3 SHEETS—SHEET 3.

FIG. 3.



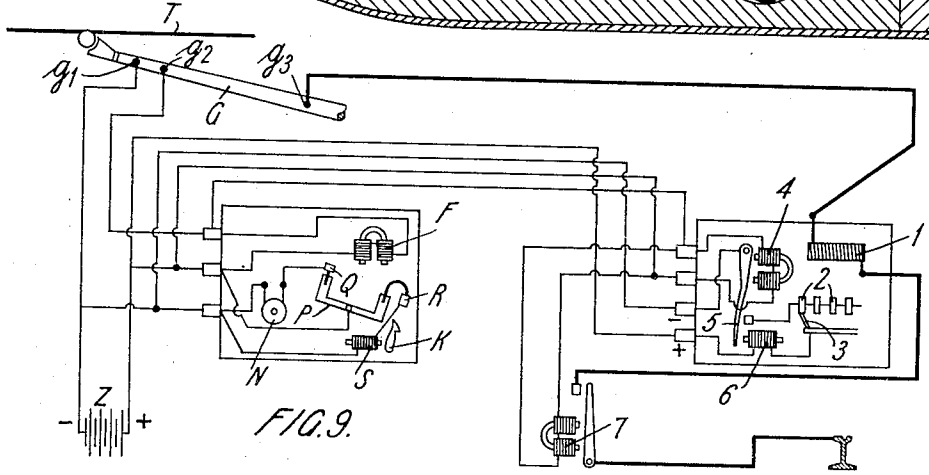


FIG. 9.

Inventor:
Charles W. Mallins,
by Spear Mueller & Donaldson
Atty's.

UNITED STATES PATENT OFFICE.

CHARLES WILLIAM MALLINS, OF BLUNDELLSANDS, NEAR LIVERPOOL, ENGLAND.

INDICATOR FOR TRAMCARS AND THE LIKE FOR INDICATING STATIONS OR STOPPING-PLACES.

1,330,887. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed March 26, 1917. Serial No. 157,512.

To all whom it may concern:

Be it known that I, CHARLES WILLIAM MALLINS, a subject of the King of Great Britain, and residing in Blundellsands, near Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Indicators for Tramcars and the like for Indicating Stations or Stopping-Places, of which the following is a specification.

This invention relates to indicators, specially applicable to tramcars, for indicating, by visual or audible signals, or by both, the name of a station or stopping point just prior to the arrival of the car at the point; and the object is to provide an apparatus preferably adapted to be automatically electrically operated by a circuit which is completed by a suitable contact on the trolley pole, which contact is operated by contact plates or cam plates carried on the trolley wire, the arrangement being such that contact is made just before the car reaches the station, whereupon, in the case of a visual signal, the name of the station is exposed to view for a suitable length of time, attention being drawn to the signal given by the ringing of a bell or the like; or, in the case of an audible signal, the said circuit is used to operate a phonograph, gramophone or like device to announce the name of the station, such announcement being preceded, if desired, by the ringing of a bell to call attention to the announcement; in some cases the device may be non-automatic and be actuated by the attendant on approaching a station.

When an audible announcement signal is desired instead of or in addition to the visible signal, a drum or disk phonograph or gramophone record of the names of the stations arranged at equal angular intervals on the periphery is provided so that when the drum or disk is rotated by virtue of the closing of an electric current as described, the successive stations are announced.

The invention is illustrated in the accompanying drawings in which:— Figure 1 is an elevation of a visual indicating device and its operating gear, the right half of the casing being in section. Fig. 2 is a corresponding end elevation with the casing shown in conventional transverse section. Fig. 3 is a view similar to Fig. 2 and shows the cylinder rotating gear in an intermediate position. Figs. 4 and 5 are side and end elevations of the contact plate on the trolley-wire and the switch on the trolley-pole; Fig. 6 is a plan view of the switch, and Figs. 7 and 8 are detail views of the switch. Fig. 9 is a diagram of connections.

Referring in the first instance to Figs. 1, 2 and 3 which show a suitable construction of a visible indicator:—

A is a light cylindrical drum on the periphery of which the names a of the stopping places are printed in the order in which they are passed in a complete journey out and home, each name appearing twice in proper order; these names may be painted or otherwise printed on the drum in the ordinary manner or they may be shown by transparent portions of the periphery illuminated by lights within the drum. In the example illustrated there is provision for ten names; for, say the two termini and three intermediate stations in an out and return journey, or for ten stations in a round journey.

The drum is carried on a shaft a^1, carried in suitable end bearings a^2, a^3 supported in an inclosing casing B, which in the main would be of light sheet metal b^1, stiffened where necessary by wood-work b^2 and provided with an intermediate transverse plate b^3 to support the actuating mechanism and if necessary to provide an additional bearing for the shaft a^1.

A tooth or pin wheel a^4 is fixed on the shaft a^1 which wheel in the present instance would have ten pins a^5, and an escapement type double pallet bar or lever is fitted to actuate the wheel a^4. In the arrangement illustrated, a bar or lever C is fulcrumed at c^1 and carries two teeth or pallets c^2 and c^3 so shaped and arranged that when the bar or lever makes a double, or to and fro oscillation the wheel is rotated one tenth of a revolution, and is locked by one of the pallets in its new position. The pins a^5 are so arranged relatively to the drum that in each successive angular position into which the drum is turned, a name a is exposed to view behind an opening or window b^4 in the front of the casing.

A screen D, carried on a lever d^1 pivoted, say, on the spindle a^1, is arranged so that it normally closes the opening or window b^4 in the casing, but is adapted to be raised as each station is reached to expose the name for

a given time interval; in the arrangement illustrated the screen is raised by means of a pin e^1 carried by a lever E which is fulcrumed at e^2 and connected to the lever C by the pin e^3, so that the window b^4 is opened when the drum is rotated and the name of the station indicated is exposed to view.

In the example illustrated an electromagnet F actuates the pallets c^2 and c^3 by the oscillation of the lever C to which are fixed the movable cores f^1 of the magnet F, the fixed cores f^2 of which are connected to the fixed yoke f^3 which with the bar portion of the lever and the fixed and movable cores form the magnetic circuit, the air gap f^4 being within the energizing coils F of the magnet. These coils are included in the circuit of a local battery in series with contacts g^1 and g^2 on the trolley-pole G (see Figs. 8 and 9), which contacts are connected either by an electrical contact-making piece on the trolley wire T at or near the station or stopping place, or by a switch g^3 on the trolley pole, which switch is actuated by a cam or plate H carried from the trolley wire.

Fig. 2 shows the position of the lever C before the magnet is energized and it will be seen that the top pallet c^2, by gravity or by means of a spring holds the wheel a^4 against rotation; when the magnet is energized by the bridging of the contacts g^1 and g^2 the lever C is pulled into the position shown in Fig. 3, and the engagement of the lower pallet c^3 with one of the pins a^5 moves the wheel a^4 through the angle x, and gives the drum half the angular movement to be imparted for each change of indication; this movement of the lever C actuates the lever E and the pin e^1, raises the lever d^1 and the screen D to the position shown in Figs. 2 and 3, and the lever d^1 is held up in this position by a pawl K which engages with the tooth d^2; the bridging of the contacts g^1 and g^2 is only momentary, and when they are disconnected the lever C falls to the position shown in Fig. 2 and the upper pallet engages with one of the pins a^5 and moves the drum A through the angle v and so completes its movement.

The name corresponding with the station is now opposite the window b^4 and the screen is in its raised position. Preferably an audible signal is given at this stage; an electric bell N, shown in dotted lines on the extreme left of the casing, is provided and it is connected in series with the local battery by means of a contact made by the screen lever d^1 while the latter is in its raised position.

The means for determining the time interval during which the screen is held raised may consist of a scape wheel or device of the dash-pot type in which a liquid passes from one chamber to another through a contracted passage-way. In the arrangement illustrated, a tube P of conducting material, say steel or iron, having a chamber p^1 at one end and a chamber p^2 at the other end connected to the chamber p^1 by the small passage-way p^5 is mounted on the lever d^1; the tube is electrically connected through the lever d^1 and the framework to, say, the positive pole of the local battery Z, and the tube is partly filled with mercury. Insulated contact rods p^3 and p^4 are fitted in the chambers p^1 and p^2 respectively; when the lever d^1 is moved by the pin e^1 to the position shown in Fig. 2 the mercury is mainly located in the chamber p^1, which previously was lowermost; in this position the contact rod p^3 makes contact by the flexible strip p^6 to the contact Q, and as the bell N is connected between Q and the negative pole of the battery Z (see Fig. 9) the bell rings until the mercury flows out of the chamber p^1 and into the chamber p^2; the rod p^4 in the chamber p^2 makes contact with a spring contact R and the latter is connected through the winding of a releasing magnet S to the negative pole of the local battery Z; as the mercury rises in the chamber p^2 it connects the rod p^4 to the positive pole of the battery Z; this completes the circuits of the winding of the magnet S which thereupon attracts an armature k^1 of the pawl K and pulls it in opposition to the spring k^2 and so releases the tooth d^2 on the lever d^1; when d^1 is released it turns into the position shown by dotted lines in Fig. 2 in which position the screen closes the window b^4 and the mercury flows back to the chamber p^1.

The switch g^3 on the trolley-pole, to connect g^1 and g^2, is pivoted at g^4, (see Fig. 8) and is normally pressed outwardly by a spring so that it is clear of the contacts g^1 and g^2. The switch is actuated by a cam or plate H carried by the bracket h^1 the ends of which are connected by insulators t^1 to the trolley wire T, the bracket being bent laterally to clear the trolley pole.

The connections described are shown in the diagram Fig. 9, this figure also shows the connections when an audible signal such as a phonograph is used.

The phonograph cylinder has, say, ten axially spaced recording surfaces, each giving the name of a station when the reproducer needle is in the groove. The drum carrying the cylindrical record is driven by a clock-work spring mechanism which is periodically wound up by an electromagnet mechanism energized by a solenoid 1. The reproducer for the record has an extension carrying say ten cylindrical contacts 2, and a brush 3 is adapted to make contact in turns with the contact 2, the brush and phonograph reproducer being moved axially by electro-magnetic means actuated by a magnet such as F energized by the local battery when the contacts g^1 and g^2 are connected

as described. Assuming the brush is brought, at a station, into contact with the first of the contacts 2, and that the magnet 4 is energized, it actuates in opposition to a spring, a switch 5 which releases the phonograph driving mechanism brake and the name of the station is reproduced audibly; the switch 5 is held over, after the contacts g^1 and g^2 are disconnected, by the holding magnet 6 the circuit of which is closed by the switch 5; as the phonograph reproducing device travels axially it moves the brush 3 away axially from the first of the contacts 2, thus breaking the circuit of the holding magnet 6 and releasing the switch 5 and putting the brake on the drum. When the next station is reached the reproducer and the brush 3 are moved axially till the brush 3 makes contact with the second cylindrical contact 2, and the action described is repeated and this station is audibly announced.

Each time the contacts g^1 and g^2 are connected a relay magnet 7 is energized and a relay switch 8 is closed which connects the solenoid 1 across from the trolley wire to the rail and so effects the winding up of the clock-work.

At the end of the tenth contact the reproducer and the brush 3 are replaced axially by hand, or by an automatic mechanism comprising a suitably driven coarse threaded worm shaft with which the reproducer, after being lifted off the record, and the brush 3, are connected through a suitable nut and by which they are returned axially to the initial position and the reproducer replaced.

Having now fully described my invention, I declare that what I claim, and desire to secure by Letters Patent is:—

1. In station indicating apparatus for tram-cars and the like, in combination; an indicator comprising a rotatable member on which the names of the stopping places are printed, a casing housing the said member and having an opening behind which the said names are successively exhibited, a screen adapted normally to close the said opening, electro-magnetic means controlled by a device on the trolley pole coöperating with a fixed device on the overhead construction and adapted to actuate the said member and operate the screen, and means for retaining the screen in the open position for a given time interval; substantially as described.

2. In station indicating apparatus for tram-cars and the like, a rotatable drum on the periphery of which the names of the stations are recorded, electro-magnetic mechanism for rotating the drum through a definite angle at each actuation, a casing having an opening through which the names are successively exhibited, a screen adapted normally to close the said opening but moved to the open position each time the drum is actuated, means for maintaining the screen in its open position for a given time interval, means for actuating the electro-magnetic mechanism comprising a local battery and a device on the trolley pole adapted to close the circuit of the local battery, and a device at each respective station adapted to operate said circuit closing device; substantially as described.

3. In station indicating apparatus for tram-cars and the like, and in combination with a visual indicating device and a shutter adapted to expose the indication for a given time interval and an audible signaling device,—the means for retaining the shutter open for a given time and for actuating the audible signal while the shutter is open comprising an electrically operated detent, a tube containing mercury carried from a lever which operates the screen, said tube having chambers at opposite ends fitted with contacts, the contacts being connected in the circuit of the electric alarm and the screen releasing means respectively; substantially as described.

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

CHARLES WILLIAM MALLINS.

Witnesses:

J. E. LLOYD BARNES,

JOSEPH E. HIRST.