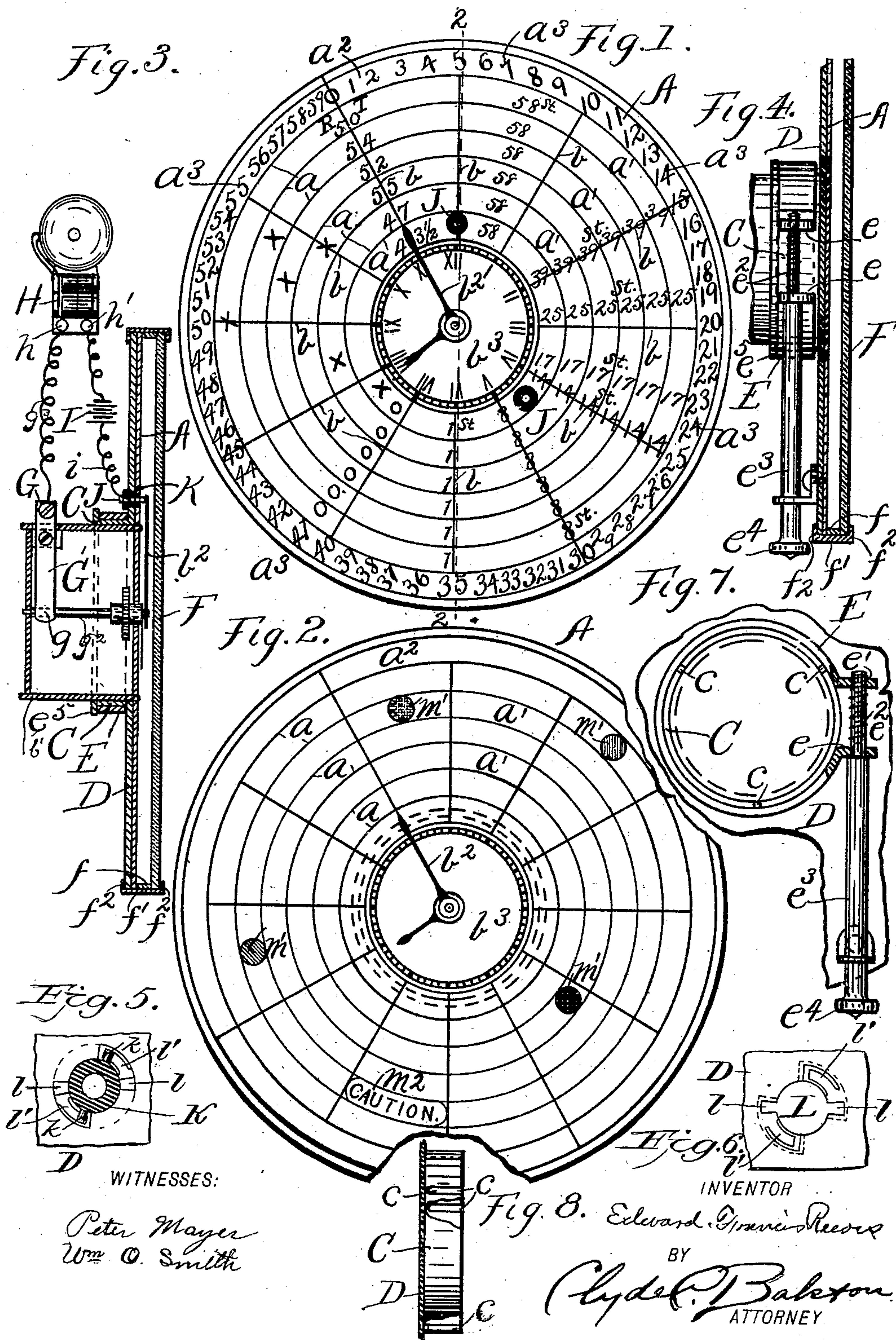


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PATENTED JULY 9, 1907.

E. F. REEVES.
SAFETY SCHEDULE FOR CARS.
APPLICATION FILED NOV. 13, 1903.



WITNESSES:

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EDWARD FRANCIS REEVES, OF BROOKLYN, NEW YORK.

SAFETY SCHEDULE FOR CARS.

No. 859,251.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed November 13, 1903. Serial No. 181,091.

To all whom it may concern:

Be it known that I, EDWARD FRANCIS REEVES, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Safety Schedule for Cars, of which the following is a specification.

My invention relates to improvements in safety schedules for the operation of street, elevated, and underground cars and trains, and particularly to a schedule which shall be used directly in connection with a timepiece; and the objects of my improvement are, first, to facilitate the even and correctly timed operation of such common carriers, to avoid blocks of said carriers *en route* and at railroad crossings; second, to facilitate the even spacing of said carriers and to avoid accidents by indicating to the motorman at all times, his proper position throughout the route that his car or train travels; third, to indicate to him at all times the time and proper position of other cars along his route, and at crossings; and fourth, to provide the schedule with both sight and audible alarm indicators.

These objects are attained by the invention as set forth in the accompanying drawings, in which

Figure 1 is a plan view of the dial adapted to be secured to a time piece and provided with indications upon its face. Fig. 2 is a partial face view of Fig. 1 partly broken away, showing special indications. Fig. 3 is a vertical section of Fig. 1 taken on line 2—2 thereof and shows additionally the electric bell danger signal connection therewith, and a clamp in cross-section for movably securing the schedule dial to the time piece. Fig. 4 is an elevational sectional view of the dial and glass, taken on the line 2—2 of Fig. 1 partly broken away and shows a detail, in side view, of a dial clamp with a broken portion of the time piece. Fig. 5 is an enlarged front view of the contact plug and shows the means for securing it in position in the reinforcing plate and disk, which latter are still further broken away. Fig. 6 is an enlarged detached plan view of the spring-catch of the reinforcing plate of Fig. 5. Fig. 7 is a detail view of the clamp of Fig. 4 with the disk mostly broken away, taken from the back of the time piece and Fig. 8 is a detached edge view, partly broken, of the part C.

Reference is had to the accompanying drawings for a full and clear understanding of my invention, in which A is a disk formed of paper, celluloid, metal, or other suitable substance, and hereinafter termed a dial. The disk being detachable, and consisting as stated of a single sheet of paper or other suitable substance with a central opening, can be slipped or temporarily held over the face of any clock or watch and the time with relation to the printed indications noted, when the said disk may be removed. On the face of said dial A are formed a series of circles *a*, one

within another, either printed or raised upon, or impressed in, the surface thereof, Figs. 1, and 2, and between these circles *a* are circular spaces *a*¹. Throughout the outer circular space *a*² are disposed numerals *a*³, ranging from 0 to 59, which are spaced in even gradation in the same relative positions and distances apart as the minute spaces on a clock or watch dial. A circular opening B is formed in the central portion of said dial, and radial lines *b* extend from said opening B to every fifth numeral of the numerical series *a*³ at the outer circular space *a*². Four of said lines fall upon or lead to the 1/4 hour numerals and may be made longer than the other lines as shown. By means of the central opening B the said dial may be movably fitted to the casing *b*¹ of a clock or watch, as shown in Figs. 1 and 2, and in modified form in Figs. 3, 4, and 7.

The dial A may be simply forced gently upon the clock or watch casing *b*¹, with sufficient friction to hold it in any set position thereon, but since it is necessary at times to adjust said dial A with relation to the minute hand (index) *b*² and the time dial *b*³ of the timepiece, a spring collar or flange C, having slots *c* is attached directly to said dial A, or to a reinforcing back plate or disk D, around which may be arranged a binding clamp comprised of a band E having its ends *e* *e*¹ turned outwardly to turnably receive through a hole in the end *e* a screw *e*² having a shank *e*³ and a milled head *e*⁴, the other end of said screw being threaded into the end *e*¹ whereby by the turning of the head *e*⁴ is effected the binding or loosening of said dial A. A flange *e*⁵ or its equivalent may be formed upon the spring collar C to hold the band E loosely in position as shown.

For some purposes it is desirable to place a cover glass F over the dial A to protect it from the atmosphere, dust and damage, and this can be easily effected by clamping the said glass F against a division or parting strip *f* by means of a band *f*¹ incasing the periphery of said back disk D and the said glass F and having flanges *f*² *f*² which hold the two latter parts together.

It is also within my contemplation of the uses to which this invention may be put, to employ the ordinary removable glass front or door.

As it is desirable that the operator's attention should be unmistakably and unerringly called to the time at which his car or train reaches or should reach a certain point, I connect with my timepiece and dial A an electric bell, which shall ring at or before one or more predetermined points of the route; and this is preferably effected by making a connection with the timepiece as at G or as at *g* by means of a spring G having contact with the minute hand arbor *g*² and a wire *g*³ connected with an electric bell H at one pole *h*. The other pole *h*¹ connects by means of a wire with one pole of a battery I, while the other pole of said battery connects by means of a wire *i* with a contact pin J which is secured within a flanged insulating plug K. This

plug K is provided with two radially disposed catch pins k which are adapted when the plug K is passed into a hole L in the back disk D (see Fig. 6), to pass through clearance slots l , and, when the said plug K is turned to the right, to ride upon the springs l^1 formed in or secured to the back disk D, and to so lock said plug K in position in said disk A, according to whichever of the perforations l^2 the said plug may be placed in.

Though I have shown but two plugs and contact pins, there may be more, as represented by the various perforations; and the number of such contact pins may be equal to the number of perforations for such purpose, and all be in position at one time in said dial A, to sound the bell signal at various points of the route being traveled.

The closing of the circuits to ring the bell H, and the breaking of said circuits is effected by the minute hand b^2 riding in contact over the said contact pins J. Other perforations may be made in the dial A and in the back disk D on lines agreeing radially (or otherwise), with the perforations in which are adapted to be inserted the contact pins J, which latter are best restricted to circles in proximity to the timepiece and the length of the minute hand b^2 . Into these auxiliary perforations may be inserted different colored plugs m^1 or a written instruction, to give warning of danger places, slow downs, crossings, extra speed, etc., or colored or printed pieces of paper may be placed back of the perforations.

With reference to the characterization of the dial A, under the designation R. T. which signifies "Running Time" of the cars or trains; will be seen in one circular space the numeral 50; within the next space the numeral 54; within the next space 52; then 55; then 47; and 43 1/2 said numbers representing the headway or the entire time that it takes a car starting at zero, to make an entire trip one way to a terminal. Another column of figures arranged radially is 58, with st., signifying "Street;" another column 39 st.; another 25 st.; another 17 st.; another 14 st.; another 8 st.; another 1 st., and then a number of x marks, signifying the terminal of the route represented in a given circular space.

When an operator is given the time at which he starts out his car or train, he first, by means of the clamp described, moves the dial A around the timepiece, until the radial line marked o stands exactly in line with his starting time upon the timepiece dial, as indicated by the ordinary minute intervals; so at the moment of starting, the minute hand will stand upon the radial zero line of the dial A. Therefore, assuming that A starts at 7.55 by the timepiece, and his running time is 50 minutes, as indicated upon next to the outer circle of the dial A, by the time the minute hand has passed around to 8.03 which would be a lapse of 8 minutes, and when the said hand would then stand radially pointing to the figure 8 of the outer circle of the dial A, he should then have driven his car to 58th street; to 39th st., as indicated by the time the hand points 15 on the dial A (and 8.10 on the timepiece); 25th street by 19 minutes; 17th street by 23 minutes; 14th street by 25 minutes; 8th street by 30 minutes; 1st street, by 35 minutes; and at the terminal of his route at the place marked x by 50 minutes, or when the hand points to 50 of the outer circle of the dial A,

which agrees with A's running time of 50 minutes designated in the radial column at the start.

During the running of the car or train, by the time that the first five minutes had expired, the minute hand would have made contact with the pin J and sounded the alarm to A to slow speed or to be on time, for crossing, etc., and the alarm would again sound when the said hand pointed to 27 of the dial A, and at whatever other places contact plugs may be inserted. B's running time being 54 minutes, he must cover the distance of his route, and arrive at his terminal at x within 54 minutes from the start, and so with each route and the cars or trains operated over it.

The running time through suburban districts such as shown in Fig. 1 are the same at all times of the day, being maximum speed as prescribed by a city ordinance. For example, 58th street, eight (8) minutes,—39th street, fifteen (15) minutes, 14th street, twenty-five (25) minutes, etc. The different running times allow thereafter for greater or lesser amount of congestion to traffic existing at certain points beyond 1st street, as well as terminal points at greater or lesser distances from the point of commencement. It also shows speed variations while passing through congested districts at different times of the commission or rush hours, or day, for example—(50) early morning, (54) morning commission hours, (52) mid-day, (55) evening commission hours, (47) midnight, (43 1/2) Sunday running time. The operator is enabled with this schedule to change and conform to any and all of the schedules as shown at any part of the route where the hour of changing to faster or slower time occurs or finds him. By this schedule all cars are changed to a uniform speed faster or slower as the case may be simultaneously at all parts of the route so designated insuring perfect interval between cars all over the route.

It will thus be seen that any operator can at all times accurately see the correct position his car should be in at any given time along the route; be able to change his running time to one of different denomination, according to the time of day and amount of traffic, and this without any calculation on his part as to what allowance he should make in the change. He can by comparison see the position that all other operators' cars along the same route should be in, the time he and they should be at crossings, should make or slow speed, etc., and he is especially warned at all dangerous points, and places where special care should be exercised.

It is obvious that in using this system of safety schedule, that all cars can be kept properly spaced and timed all along a route, which insures freedom and safety from jamming, blocks, and consequent collisions.

The construction I have herewith illustrated sets forth my invention in a practical and operative form, but I am aware that the same invention can be otherwise technically carried out, without departing from the spirit of the invention herein shown and described.

What I therefore claim and seek to cover in a broad sense is:—

1. In a safety time schedule for cars having a time piece and an independent dial arranged concentrically of said time-piece and having characters disposed in series, one of said series representing clock, time indications, other of said series representing street or station indica-

tions, and a plurality of other of said series respectfully representing different running time indications: viz. 50—54 52—55—47 and 43½.

2. In a safety time schedule for the running of cars comprising a time piece having a dial, a dial arranged concentrically around and movably secured to said time piece, a spring collar carried by said dial, a series of characters arranged on said concentrically arranged dial and an index for said dials, said index being carried and operated by said time piece, an electric alarm having contact in connection with said time piece and an other contact in connection with said dial, the said contact comprising in part, one or more perforations formed in said concentric dial and an electric plug, the said plug having an exposed portion and means whereby said plug is detachably secured to said dial in one or more of said perforations as and for the purpose described.

3. In a safety time schedule for the running of cars, comprising a time piece having a dial and a second dial provided with perforations, arranged concentrically around and movably secured to said time piece, a spring collar provided with clamping screws, carried by the second named dial, and an index for said dials, said index being carried and operated by said time piece, and an electric alarm having contact with the time piece and with the movable concentrically arranged dial, and contact plugs provided with radially disposed pins to engage catch springs, said pins being thereby detachably secured in one or more of the perforations of the dial as and for the purpose described.

4. In a time schedule for the running of cars, a time piece having a dial, a dial provided with a spring collar and arranged concentrically around and movably secured to said time piece, a series of characters arranged on said concentrically arranged dial and an index for said dials, said index being carried and operated by said time piece, and an electric alarm bell connected with said index and with said dial at different points of the latter and a contact plug inserted in one or more perforations in said concentrically arranged dial for the contact between the time piece and dial substantially as described.

5. In a safety time schedule for the running of cars the combination of a time piece and a dial provided with a large central aperture having a spring collar arranged around the periphery of said aperture, whereby the dial is movably secured concentrically of said time piece, said dial having one or more small perforations and a series of characters arranged concentrically of said dial and an electric alarm bell having contact in connection with said time piece and another contact with said dial, the said contact comprising in parts electric plug inserted in one of the small perforations of the dial and another contact through the medium of the hand and plug, the said plug having an exposed portion and an insulated portion and means for detachably securing said plug in the apertures of the dial substantially as described.

6. In a safety time schedule for the running of cars comprising a time piece having a dial and a dial having a spring collar and clamping screws suitably secured to the back of said dial, and arranged concentrically around and movably secured to said time piece by the spring collar and clamping screws, a series of characters arranged concentrically of the last named dial and an index for said dials, said index being carried and operated by the time piece, and an electric alarm bell having suitable contacts with the time piece and dial as and for the purpose described.

7. A safety time schedule for the running of cars, comprising a timepiece having a dial, a dial arranged concentrically around and movably secured to said timepiece, the said securing means comprising a clamp, the said clamp having a split spring sleeve, the said sleeve carried by said dial and fitting frictionally on said timepiece, a band surrounding said sleeve, and a binding screw turnably carried by and threaded into a portion of said band, and a head carried by said screw, a series of characters arranged on said concentrically arranged dial, an index for said dials, said index being carried and operated by said timepiece, substantially as set forth.

8. In a safety time schedule for cars having a timepiece and an independent dial arranged concentrically of said time piece, one of said parts being adjustable with respect to the other, said independent dial having characters disposed in series one of said series disposed in minute indications in the direction of the time piece numerals, other of said series representing street or station indications and a plurality of other of said series respectively representing different headway or interval and starting time indications: viz. 50—54—52—55—47 43½, for different cars, and headway and starting indications being arranged at zero points of said independent dial.

9. In a safety time schedule for cars having a time piece and having a dial adjustably and movably arranged concentrically of said time piece and having characters arranged upon said latter dial, said characters being disposed in series, one of said series disposed in minuted indications in the direction of time piece numerals around said dial, another of said series representing street or station indications and another of said series representing headway and starting time indications for different cars, the said headway and starting indications being arranged at zero points of said adjustable dial, a series of circular spaces arranged upon said dial, a headway starting time arranged on a circle opposite the zero indications and another headway starting time arranged on the other circular space of said dial, the street or station indications being disposed in conjunction with the said different circles.

10. In a safety time schedule for cars having a time piece and having a dial adjustably and movably arranged concentrically of said time piece and having characters arranged upon said latter dial, said characters being disposed in series, one of said series disposed in minuted indications in the direction of time piece numerals around said dial, another of said series representing street or station indications and another of said series representing headway and starting time indications for different cars, the said headway and starting indications being arranged at zero points of said adjustable dial, a series of circular spaces arranged upon said dial, a headway starting time arranged on a circle opposite the zero indications and another headway starting time arranged on the other circular space of said dial, the street or station indications being disposed in conjunction with the said different circles and an electric alarm in combination therewith substantially as described.

Signed at borough of Brooklyn in the county of Kings and State of New York this 11th day of November A. D. 1903.

EDWARD FRANCIS REEVES. [L. S.]

Witnesses:

JOHN J. DOUGLAS,
J. LESSER.