No. 784,216. PATENTED MAR. 7, 1905.

C. F. JACKSON.

PASSENGER RECORDER.

APPLICATION FILED JAN. 20, 1904.

3 SHEETS—SHEET 1.

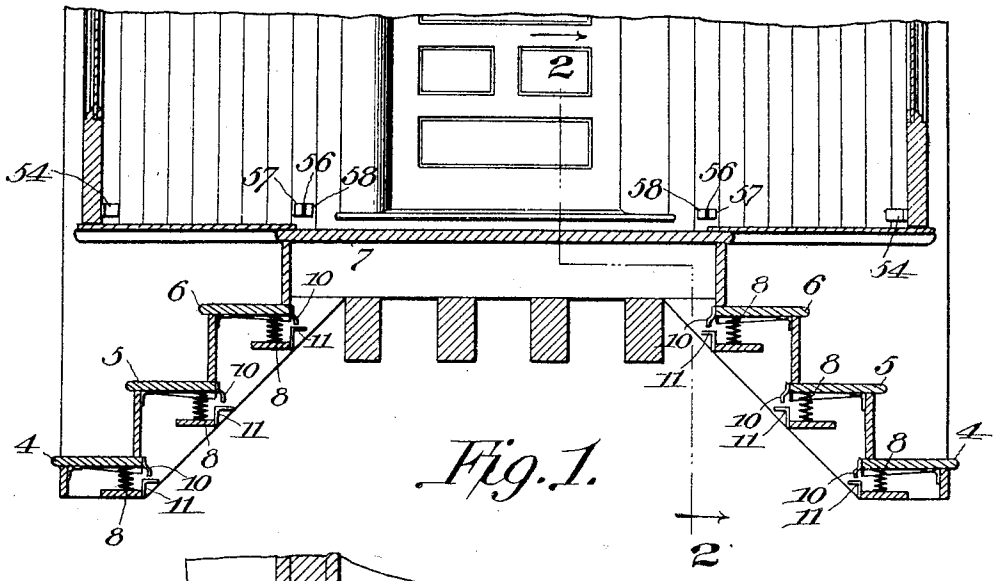


Fig. 1.

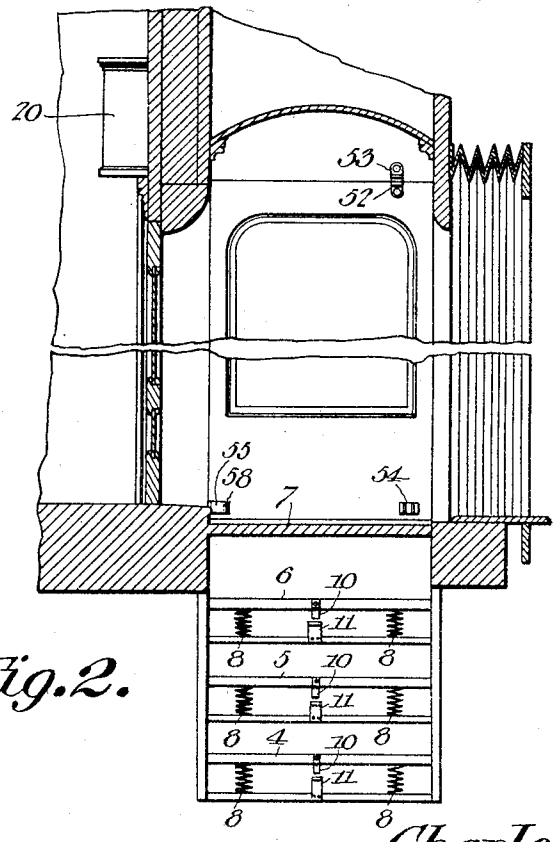


Fig. 2.

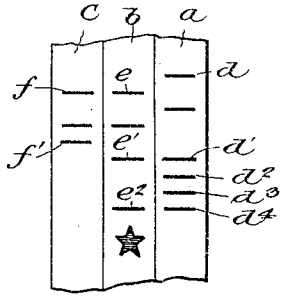


Fig. 6.

Witnesses

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3 SHEETS—SHEET 2.

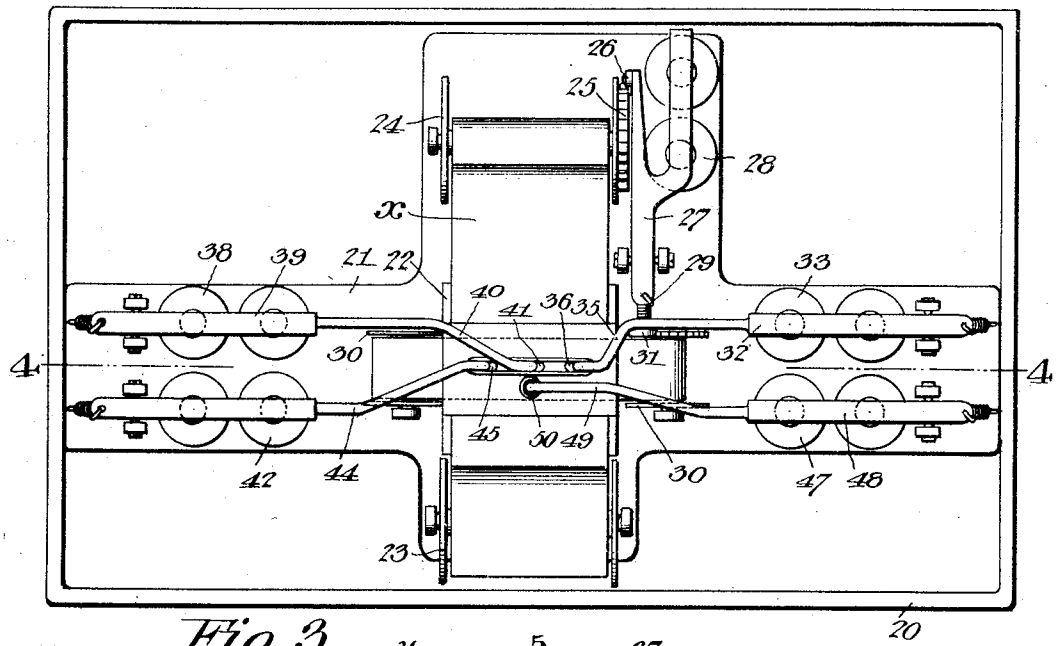


Fig. 3.

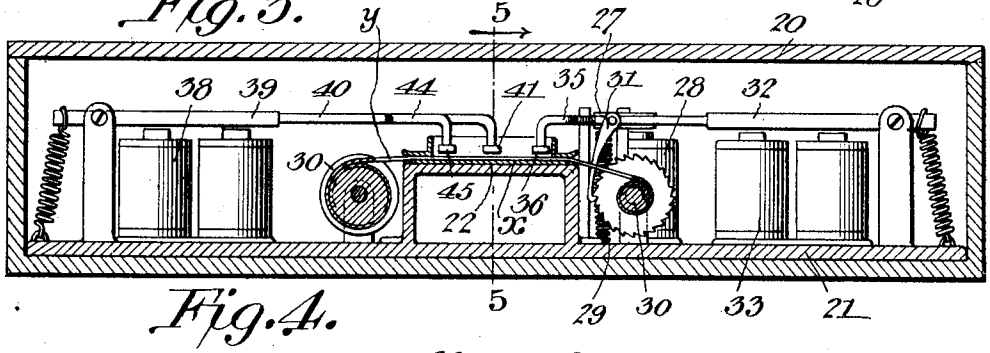


Fig. 4.

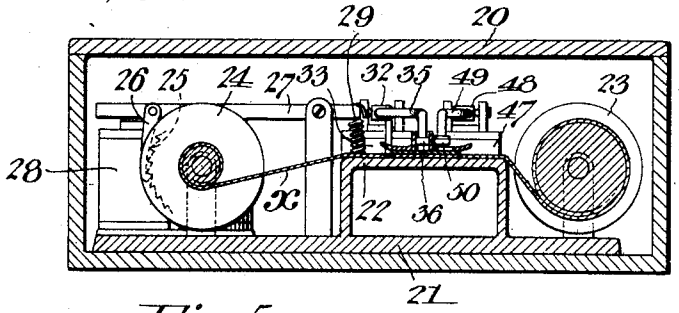


Fig. 5.

Witnesses

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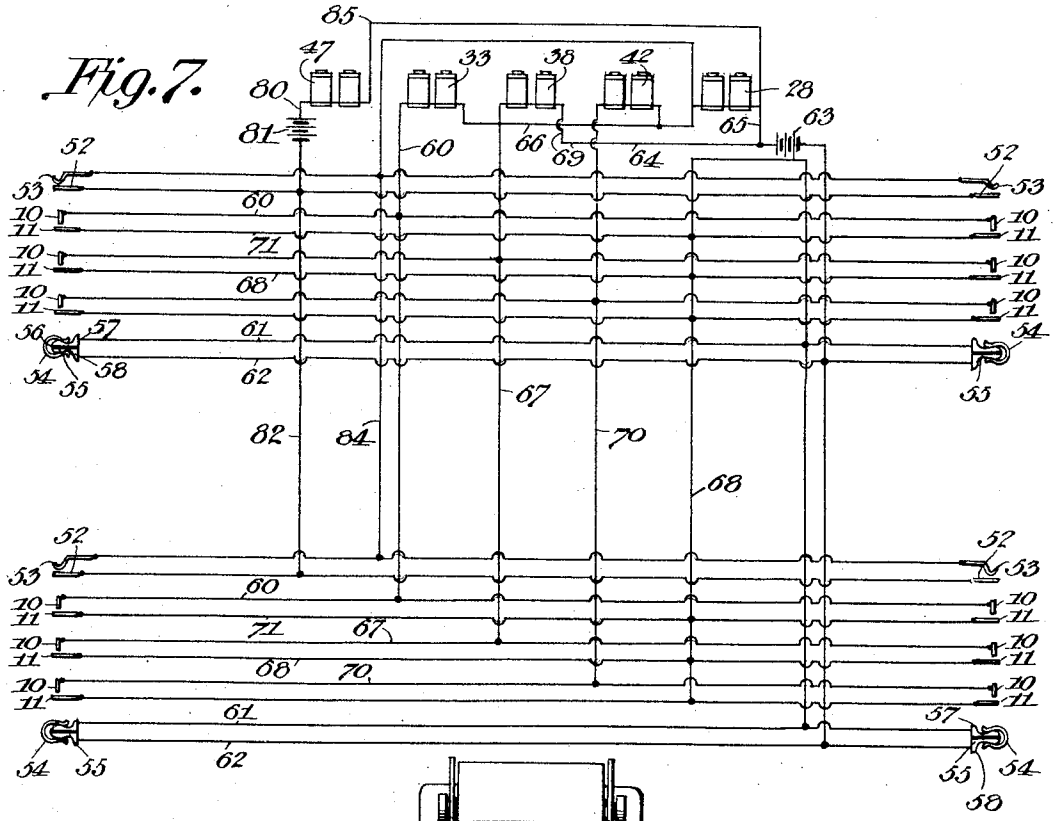
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3 SHEETS—SHEET 3.

Fig. 7.



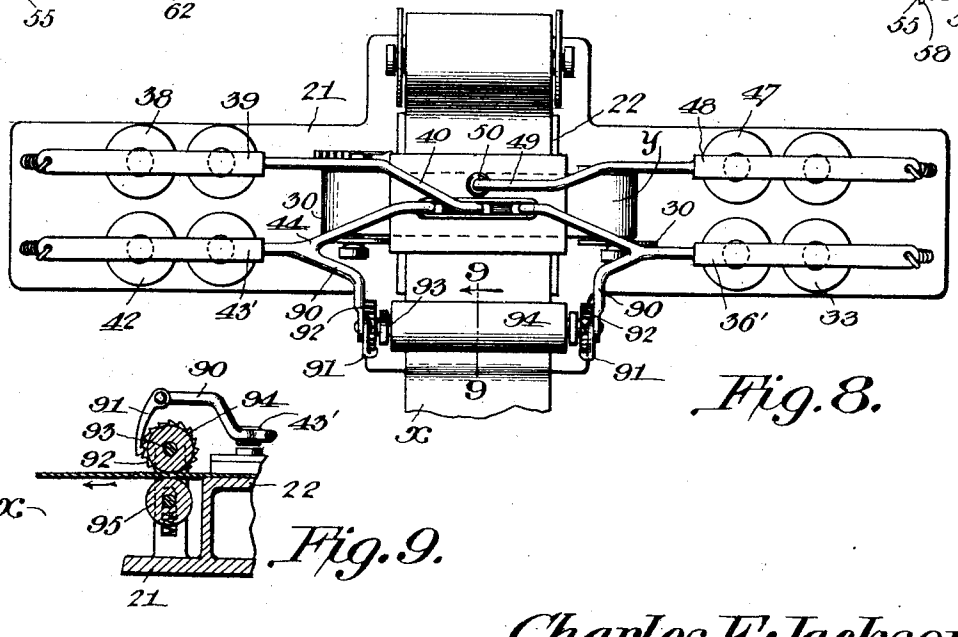


Fig. 8.

Fig. 9.

Witnesses

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No. 784,216. Patented March 7, 1905.

UNITED STATES PATENT OFFICE.

CHARLES F. JACKSON, OF SHERMAN, TEXAS.

PASSENGER-RECORDER.

SPECIFICATION forming part of Letters Patent No. 784,216, dated March 7, 1905.

Application filed January 20, 1904. Serial No. 189,878.

To all whom it may concern:

Be it known that I, CHARLES F. JACKSON, a citizen of the United States, residing at Sherman, in the county of Grayson and State of Texas, have invented a new and useful Passenger-Recorder, of which the following is a specification.

This invention relates to improvements in passenger-recorders of that general class employed in connection with cars and other vehicles for keeping a record of the number of persons boarding or alighting from the vehicle.

The principal object of the invention is to provide a recorder so constructed and operated as to produce a record which indicates the number of passengers boarding a car as well as the number of passengers alighting therefrom.

A further object of the invention is to construct a passenger-recording device that will produce a readable record of the direction in which the passenger was moving at the time the record was made, and, further, in the event of persons mounting the steps of the car will distinctly show whether such persons entered the car or alighted without entering.

A still further object of the invention is to provide a recording device in which a readable record is kept on an intermittently-movable strip or other recording-surface and in which the strip is automatically divided into sections or spaces each of which will show the number of passengers entering and leaving the car at each stopping-point, so that the business done at each station or on a railway or other line may be accurately determined.

A still further object of the invention is to provide a recording device so arranged and constructed that in the event of the train crew neglecting orders on certain lines respecting the opening and closing of the doors a record of the fact will be kept on the passenger-recording strip.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a transverse sectional elevation of one end of a railway-car, showing the steps provided with circuit-closing devices in accordance with the invention. Fig. 2 is a longitudinal sectional elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a plan view of the recording mechanism employed. Fig. 4 is a longitudinal sectional elevation of the same on the line 4 4 of Fig. 3. Fig. 5 is a transverse sectional view of the recording mechanism on the line 5 5 of Fig. 3. Fig. 6 is a detail view of a portion of the record-strips. Fig. 7 is a diagram of the electrical connections. Fig. 8 is a view corresponding to Fig. 3, illustrating a modified construction. Fig. 9 is a sectional view of a portion of the same on the line 9 9 of Fig. 8.

Similar numerals and letters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The apparatus forming the subject of the present invention is designed for use in connection with vehicles of any class and character and in the drawings is illustrated as used in connection with a vestibule railway-car having the usual four doors, two of said doors being disposed at each end of the car. The car is provided with four sets of steps, each, as usual, comprising three steps 4, 5, and 6 and the top or platform step 7, the three steps 4, 5, and 6 being yieldable or movable under the weight of the passenger either entering or leaving the car, and each is adapted, through suitable electromechanical connections, to make a record when pressed under the weight of a person entering or leaving the car. Each step is hinged at its front edge, and its rear edge is supported by means of suitable springs 8, which may be of any desired character, and one or more of the springs may be employed for each step, as circumstances may require. In order that the record of fare-paying passengers may be kept as accurately as possible, the springs are so adjusted as to yield only under the weight of a grown person, being

non-yieldable under weights of sixty pounds, more or less, so that children entering the car will not operate the recorder. Near the rear edge of each step is a metallic contact 10, which when depressed is adapted to engage a contact 11, carried by a stationary bracket arranged under the step, and when these two contacts are engaged a circuit is formed and one or other of the electromagnets of the recording apparatus is energized. This operation occurs on the successive steps 4, 5, and 6 as the passenger is boarding a car and on leaving the operation is in reverse order. While in the present instance three steps are shown as applied to a railway-car, it will be understood that more or less steps may be used and that the mechanism may be employed in connection with street-cars, coaches, railway-cars of any type or character, and in some cases may be used on the steps of theaters or other places of public resort where it may be desired to keep a record of persons arriving and departing therefrom.

At a convenient point on the car or other vehicle is a suitable casing 20, which may be locked and the key kept in the possession of the proper official of the road. In this casing is a frame 21, carrying a platen 22, over which is guided a recording-strip x, wound upon a supply-wheel 23, and during the operation of the mechanism this strip is wound upon a receiving-reel 24, the shaft of which is adapted to suitable bearings on the frame. On the shaft or forming one of the end flanges of the reel is a ratchet-wheel 25, which is engaged by a pawl 26, carried by the armature 27 of an electromagnet 28. The armature of the magnet is normally held elevated by a spring 29, and when the electromagnet is energized the armature descends against the stress of the spring and the pawl 26 engages a fresh tooth on the ratchet-wheel. When the magnet is deënergized, the spring 29 holds it up and the pawl rotates the ratchet-wheel and reel for a short distance and presents a fresh portion of the recording-strip to imprinting position of the platen. At the opposite sides of the platen are arranged reels 30, carrying an inked ribbon y, and one of the reels has an end flange provided with ratchet-teeth to be engaged by the pawl 31, carried by the armature 32 of an electromagnet 33, and each time this electromagnet is energized the pawl descends and engages a fresh ratchet-tooth. When deënergized, the returning-spring of the armature operates it in such manner as to pull the ratchet, and thus revolve the ribbon-receiving reel for a short distance. The armature 32 of electromagnet 33 carries a finger 35, that is bent downward over the inked ribbon and recording-strip and carries an imprinting-type 36 at its lower end. This type may be in the form of a dot and dash or a numeral, letter, or other distinct mark, and by preference each of the recorders will carry distinct type of different character, so that the record-strip may be identified with the car on which it is placed. An electric magnet 33 is connected to the lowermost step 4 and is energized each time said step is depressed, and said lowermost step is further connected to the electromagnet 28, so that after both magnets 28 and 33 have been energized and the record has been made the upward movement of the armature 27 when released will feed the recording-strip forward in the manner previously described. At a point adjacent to the electromagnets 33 is an electromagnet 38, having an armature 39, carrying an arm 40, provided with an imprinting-type 41. The electromagnet 38 is connected to contacts of the step 5 and when energized will make a record on the strip x, and in this case the strip-operating magnet 28 will not be energized and the strip will remain in the same place after the imprinting operation. The frame supports the electromagnet 42, having an armature carrying an arm 44, at the end of which is an imprinting-type 45, also adapted to mark the strip, and said electromagnet 42 is connected with the uppermost step 6 and the electromagnet 28, so that each time a passenger depresses the step 6 the type will make an impression on the strip and afterward the strip will be forwarded for a short distance in the direction of the receiving-reel.

Before describing in detail the electrical connections reference is had to Fig. 6, which shows a portion of the record-strip, that for convenience has been divided into three parallel columns a, b, and c. When a passenger steps on the lowest step, 4, the type will make the mark d, and the strip will then be advanced one step. When the passenger mounts the next step, 5, the type 41 will make the mark e, and should he continue and mount the step 6 a further mark f will be made in the column c. The passenger will thus make several marks in the three columns, as indicated. When a passenger leaves the car, he will first depress the step 6, making the mark f', and the strip will then be advanced a short distance, so that when a passenger depresses step 5 the mark e' will be made in column b, and when step 4 is depressed the mark d' will be made in column a, so that the auditor or other officer of the road may determine at a glance just how many passengers entered and left the car. Should a passenger mount the step 4 and then return to the platform, a single mark d^2 will be made; but should he mount the steps 4 and 5 and then return to the platform the marks d^3, e^2, and d^4 will be made, so that under all ordinary conditions a thoroughly accurate record of the number of passengers entering and leaving a car will be made. On some railroads orders are issued to the train crew to open but one door of a car, and should this order not be obeyed and passengers si-

multaneously enter at both ends of a car the record made will be more or less blurred, and the failure to obey orders will thus be recorded. It is further desirable to keep a record of the number of times the doors are opened and closed, thus constituting a record of stations at which a car stops, and for this purpose an additional electromagnet 47 is arranged adjacent to the platen and is provided with an armature 48, carrying an arm 49, at the end of which is an imprinting-type 50, adapted to make a mark of distinctive character—as, for instance, a star or other symbol—which may be readily distinguished from the passengers' record-marks. This electromagnet is also connected in series with the operating-magnet 28, so that after its imprinting movement the paper will be forced forward, so as to present a fresh surface for the passenger-record at the next station. The electromagnet 47 is connected to contacts 52 and 53, one carried by the upper portion of each vestibule-door or other movable member and the other by a fixed frame, so that when any one door is closed the circuit will be closed, and the electromagnets 47 and 28 will be energized.

The car is further provided with circuit-breakers, which may be of the character shown in Fig. 7, comprising a pair of connected spring-fingers 54, carried by the lower portion of the door, and a stud 55, carried by the floor or other fixed point and divided by insulating material 56 into two sections 57 and 58. It will be seen that if the sections 57 and 58 form the terminals of an electromagnet-circuit said circuit will be broken except at such times as the fingers 54 are engaging therewith. The fingers 54 and stud 55 form the usual stops or catches for holding the doors in open position, and the circuits connected to the studs are the main operating-circuits, which are broken whenever the door is closed when the train is traveling; but when the door is open the fingers 54 engage the studs 55 and complete the circuit, so that passengers entering or leaving the cars at the stations will operate the register.

The circuits may be arranged in any suitable manner in accordance with the number of steps, doors, and other movable parts which form circuit-closers; but in a vestibule-car having at each corner three movable steps and a door it is preferred to use the wiring system shown in the diagram. This wiring system comprises a wire 60, extending from the winding of the electromagnet 33 to all of the movable contacts 10 carried by the lower steps 4, the wire being shown as having several branches in order to avoid unnecessary reference characters. From each of the contacts 11 of the lower step 4 leads a wire 61, that may be traced through several connected branches to the portions 57 of the studs 55. From the opposite portions of the studs 55 extends a wire 62, the several branches of which are connected, as shown, and said wire leads to one pole of a battery 63. From the opposite pole of this battery extends a wire 64, that is connected by a wire 65 to the strip-operating electromagnet 28 and from thence by a wire 66 to the electromagnets 33 and 42. This will make a complete circuit from a step 4 to the electromagnets 28 and 33, and as said electromagnets are connected in series both will be operated when one of the steps 4 is depressed. Leading from the electromagnet 38 is a wire 67, the several branches of which are connected to the contacts 10 of the intermediate steps 5. From the contacts 11 of the intermediate steps 5 lead wires 68, the several branches of which are connected to the wire 61, which, as above described, connects with the terminals 57 and 58, and from thence is returned by wire 62 to battery 63. The wire 64, leading from battery 63, is connected by wire 69 to the electromagnet 38, thus showing a complete circuit of the electromagnet which governs the printing in the column *b*. Leading from the electromagnet 42 is a wire 70, the several branches of which are connected to the contacts 10 of the upper step 6. From the contacts 11 of the uppermost step lead wires 71, all of which are connected to the wire 61. The return-circuit will be traced from wire 61, terminals 57 and 58, wires 62, battery 63, wire 64, wire 65, electromagnet 28, and wire 66 to electromagnet 42, thus showing the complete circuit of the electromagnet which governs the imprinting in the third column *c*. Tracing now the circuits of the electromagnets which control the movable ribbon of the imprinting or what may be called the "station-marker," 80 indicates a wire leading from electromagnet 47 to a battery 81 and thence by a wire 82 to all of the contacts 52 carried by the several vestibule-doors. From the stationary contacts 53 lead branch wires 84, which are connected together and to the electromagnets 28. From this magnet a circuit is completed to the electromagnet 47 by means of a wire 85. It will be observed that the wiring is in some places unnecessarily duplicated and that two separate batteries have been shown; but these are simply for the purpose of making the wiring system clear, it being understood that only a single battery or several batteries may be used and that some of the wires may be connected together in order to save expense.

The arrangement of the strip-feeding mechanism may be modified in various ways, and, if desired, the construction shown in Figs. 8 and 9 may be employed. In these figures the armatures 36′ and 43′ are each provided with extended arms 90, carrying pawls 91 for engagement with small ratchet-wheels 92, carried by the opposite ends of a spindle 93, on which is a feed-roller 94 in engagement with the strip. Beneath this roller is a second compression-roller 95, the strip being fed be-

tween the two rollers and receiving a step-by step movement each time one or other of the electromagnets 33 or 42 is energized. This movement of the strip will be more uniform than where a reel is employed, owing to the fact that in the latter construction the constantly-increasing diameter of the roll of paper on the reel will result in a proportional increase feed, and the spacing between the successive markings will be irregular. The construction also enables the manufacturer to omit the additional strip-feeding magnet 28. The feed-rollers may further push or pull the strip from the platen, and the feeding operation may be accomplished during the downward movement of the imprinting device; but it is preferred that the feeding movement will take place after the type have operated, so that there will be no danger of blurring or of tearing the paper.

Having thus described the invention, what is claimed is—

1. In a passenger-recorder, a plurality of yieldable steps each having independent circuit-closing contacts, a plurality of imprinting devices, electromagnets controlling the movement of the imprinting members, said magnets being independently connected in circuits leading to the step-contacts, and electromagnetically-controlled operating means connected in series with certain of the electromagnets of the imprinting members and serving to feed the record-strip only at intervals with respect to the operation of the imprinting devices.

2. In passenger-recorders, a series of three movable steps each having independent circuit-closers, three electromagnets connected one to each of the steps, imprinting devices operably connected to the armatures of the electromagnets, and means for imparting feeding movement to the record-strip after closing of the circuits controlled by the first and third steps.

3. In passenger-recorders, yieldable steps, movable doors or gates, independent contacts carried by the steps and doors and forming the terminals of electric circuits, electromagnets connected with the circuits, imprinting devices having operative connections with the armatures of said electromagnets, an auxiliary imprinting device, an operating-magnet therefor, a circuit in which the operating-magnet is connected, and contacts forming the terminals of said circuit, said contacts being moved to engaging position on the closing of the doors.

4. In passenger-recorders, a plurality of yieldable steps, a movable door or gate, independent contacts carried by the steps and doors, circuits of which the contacts form terminals, electromagnets connected in said circuits, imprinting devices operatively connected to the armatures of said electromagnets, and a battery-circuit connected to and forming a part of the magnet-circuit, said battery-circuit having terminals disposed adjacent to the door of the vehicle and arranged to break the circuit when the door is closed.

5. In a passenger-recorder for vehicles, a plurality of yieldable steps each having independent contacts, a door, contacts controlled thereby, circuits of which the contacts form terminals, electromagnets connected in said circuits, imprinting devices operatively connected to the armatures of said electromagnets, means for imparting a step-by-step movement to a record-strip, an auxiliary electromagnet, a printing member carried thereby for recording on the strip the stations at which the vehicle stops, an independent circuit for the magnet, said circuit having terminals that are movable into engagement by the closing of the vehicle-door, and a battery-circuit having terminals disposed adjacent to the door and movable to break the circuit when the door is closed.

6. In a passenger-recorder, a plurality of yieldable steps, contacts carried thereby and forming the terminals of independent circuits, a casing, a platen arranged in the casing, electromagnetically-actuating means for a recording-strip, an inked ribbon also movable over the platen, an electromagnetically-movable feeding means for the ribbon, a plurality of imprinting devices, and electromagnets for actuating the same, said electromagnets being disposed in the circuit of which the step-contacts form the terminals.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES F. JACKSON.

Witnesses:

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