

G. L. DOUGLASS.
RECORDING APPARATUS.
APPLICATION FILED AUG. 5, 1918.

Patented Aug. 16, 1921.

2 SHEETS—SHEET 1.

1,387,642.

Fig. 1.

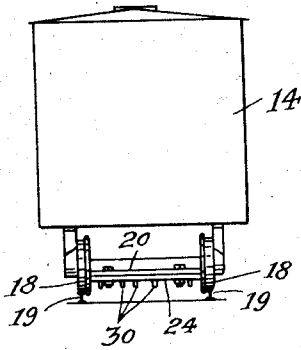


Fig. 2.

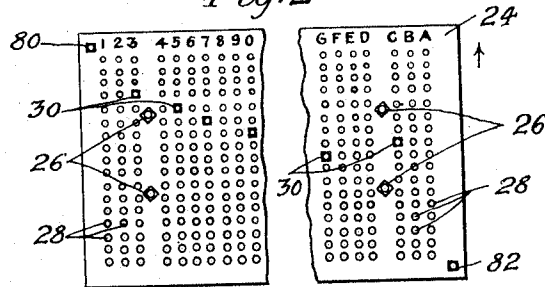


Fig. 3.

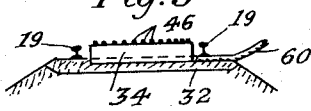


Fig. 4.

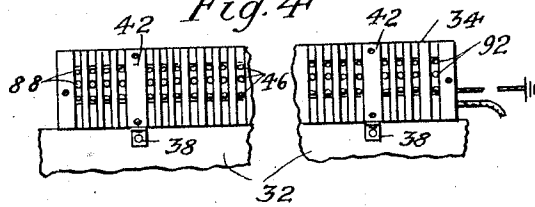


Fig. 5.

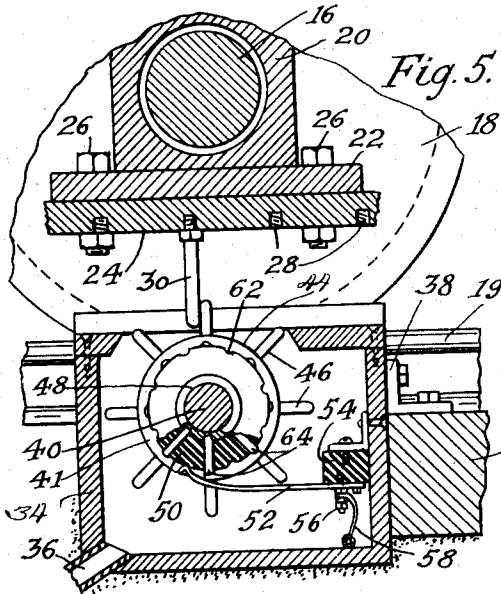


Fig. 8.

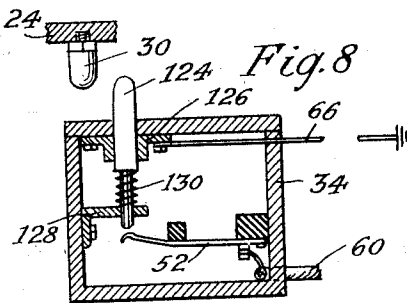


Fig. 9.

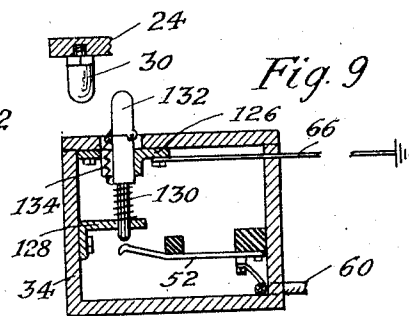
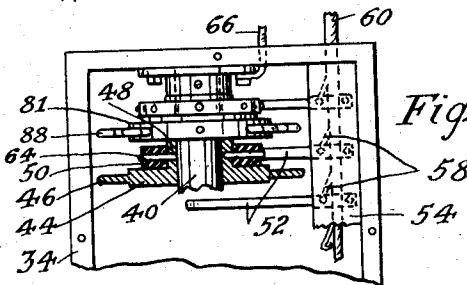


Fig. 6.



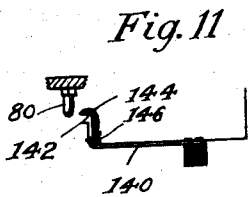
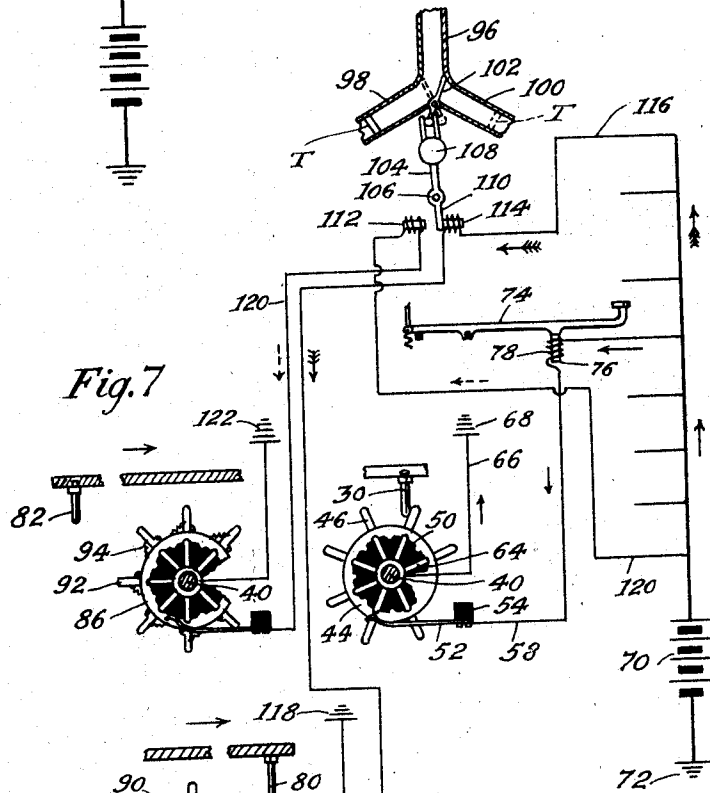
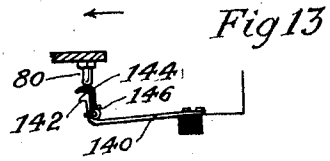
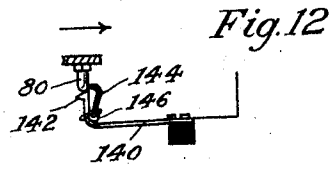
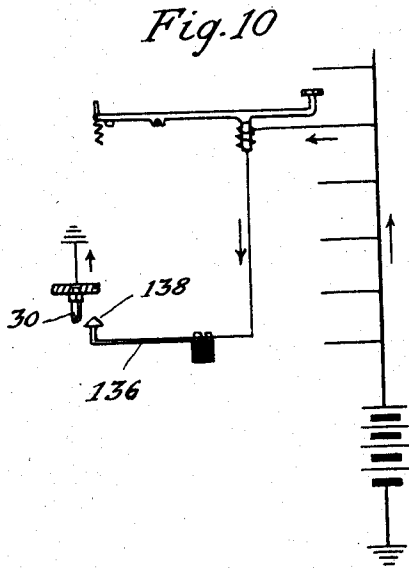
Inventor:
Gibson L. Douglass
By Whiteley and Ruckman
his Attorneys.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

GIBSON L. DOUGLASS, OF DULUTH, MINNESOTA.

RECORDING APPARATUS.

1,387,642.

Specification of Letters Patent. Patented Aug. 16, 1921.

Application filed August 5, 1918. Serial No. 248,368.

To all whom it may concern:

Be it known that I, GIBSON L. DOUGLASS, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Recording Apparatus, of which the following is a specification.

My invention relates to recording apparatus and particularly to apparatus for making records to identify vehicles such as railway cars. The present practice in regard to keeping records of freight cars which are in transit is for employees known as checkers to jot down the car numbers in succession as the cars pass the position where the checkers are stationed. For this purpose a large number of employees are necessary. The numbers have to be taken down hurriedly, with consequent liability of mistake both on the part of the checker and on the part of the person who subsequently reads the record of numbers. Not only is there liability of mistake in deciphering the numbers which have been hurriedly jotted down, but there is always liability of transposing some of the numerals or other identifying characters. The numbers which are painted on the cars may become partially obliterated so that the checkers fail to read them properly, and the checkers are exposed to all conditions of weather. Considerable time elapses before the checkers turn in their reports, so that the record is not immediately available. An object of my invention is to provide means associated with each car whereby records identifying the cars as they pass any selective points may be made automatically. Another object is to effect economy through dispensing with a large number of employees. Another object is to do away with liability of mistakes in the record by making the device automatic and therefore not liable to errors resulting from the human equation. I accomplish the objects of my invention by the provision of means whereby a printed record in clear type may be made at any desired point, such record serving to identify all of the cars in order as they pass any selected point, and the recording operation being carried out automatically, up to and including the setting of the type.

The full objects and advantages of my invention will appear in connection with the

detailed description thereof and are particularly pointed out in the claims.

Referring to the accompanying drawings, which illustrate some of the embodiments 60 which my invention may assume,—

Figure 1 is an end elevation of a railway car showing a portion of my apparatus attached thereto. Fig. 2 is an enlarged bottom plan view of the attachment shown in 65 Fig. 1. Fig. 3 is a cross sectional view of a track showing the portion of my apparatus which is located in the roadway. Fig. 4 is an enlarged top plan view of the portion of the apparatus shown in Fig. 3. Fig. 70 5 is an enlarged view in longitudinal section showing the two portions of the device associated in operative position. Fig. 6 is a detail view partly in section. Fig. 7 is a diagrammatic view of the recording 75 system. Fig. 8 is a view similar to Fig. 5 showing a modified form. Fig. 9 is a detail view of a portion of the device used in connection with the form shown in Fig. 8. Fig. 10 is a diagrammatic view of another 80 modified form. Fig. 11 is a detail view of a portion of the device used in connection with the form shown in Fig. 10. Fig. 12 is a view similar to Fig. 10 showing the device in operating position. Fig. 13 is a view 85 showing the action of this portion of the device when the car moves in the opposite direction.

Referring to the particular illustrative construction shown in the drawings, 14 designates a railway car supported as usual on trucks, one of the axles of which is shown at 16 provided with wheels 18 adapted to run on rails 19. The axle is mounted in journals 20 and on its under side is the usual sand- 95 board 22. I may utilize this sand-board or any other suitable fixed part of the car as a supporting means for selectively positioning operating elements. However, for convenience I have shown a plate 24 which is secured to the sand-board by bolts 26. The plate 24 is provided with a plurality of rows of screw-threaded holes 28 into which are adapted to be screwed a number of selectively-positioned studs 30 which extend 105 downwardly from the plate when the same is secured in position on the car. It will be understood that the provision of the plate 24 is a matter of convenience and that the studs may, if desired, be attached to the car in any 110 suitable manner. As illustrated in Fig. 2, which shows the bottom of a plate adapted

to be attached to a car, there are ten rows of holes in the plate corresponding to the ten numerals including naught, and additional holes are provided for symbols which serve to designate the particular line or road. Any desired symbols may be used for this purpose, and since it is customary at present to designate different roads by names, I have shown a number of rows of holes corresponding to letters. The plate is shown broken away to indicate that any desired number of rows intended to identify different roads may be used, and it is obvious that the number of holes in each row should be equal to the number of numerals in the car having the highest number, plus the number of letters or symbols which are necessary to designate the particular road identified by the largest number of such symbols, and to this number may conveniently be added one or more holes for placing a dash or dashes between the car number and the name. It is obvious that the number of rows of holes and the number of holes in any particular row may be varied as desired according to the particular system of identifying symbols which is adopted. By placing studs in the holes of different rows at progressive distances in the rows the studs may be so arranged as to indicate the car number and road designation of any particular car. As shown in Fig. 2, the identifying record is represented as 3570 CG. This means that the car number is 3570 and the road identified as CG.

At any suitable location where it is desired that the cars be checked, the mechanism now to be described is installed. In the roadway between the ties, one of which is designated at 32, is rigidly positioned a box 34 which may be provided at its bottom with a drain 36. The box may be secured firmly in place, as shown by angle irons 38, which secure it to a tie, but it is evident that the box may be securely held in any desired manner. Firmly secured within the box is a stationary shaft or rod 40 which may be secured to the box at its ends and may also be secured by strap members 42 located from the ends of the box at the same relative positions as the bolts 26 occupy with relation to the plate 24. A plurality of disk-like members 44 are rotatably mounted on the rod 40 and extending radially from each of these members are a number of studs 46 adapted to be engaged by the studs 30 on the cars. As shown, there are eight studs on each of the members 44 while the studs 46 and 30 are so positioned and are of such length that any particular member 44 will be given one eighth of a turn for each engagement of the studs. The members 44 have integral sleeves surrounding the rod 40 and upon which are secured disks 50 of insulating material. Arranged for cooperation with each of the

disks 50 are contact fingers 52 secured at one end to insulating material 54 and having binding posts 56 to which wires 58 may be attached. These wires extend in a cable 60 from a station to be described later. The free ends of the fingers 52 are shaped to constitute detents for engagement in notches 62 in the disks 50 whereby the members 44 are retained in position except as they are turned by the studs 30. Mounted in the disks 50 and extending into the sleeves 48 are contact pins 64 which are the same in number as the studs 46. These pins are engaged by the fingers 52 during a portion of each movement of the members 44. An electrical circuit is thus completed, since the current is conducted by a wire 66 through a ground 68 or is grounded in any other suitable manner.

Referring to Fig. 7 it will be seen that the wires 58 are connected with a suitable source of electrical energy 70 grounded at 72. At any suitable station is located printing apparatus which is placed between the source of electrical energy 70 and the checking station where the box 34 and its associated mechanism are located. The printing apparatus preferably consists of the well known Mergenthaler in which key bars 74 corresponding to the characters indicated by the holes in the plate 24 are utilized. Each of those key bars which correspond to the characters used in my system has attached to it a core member 76 of a solenoid, the other member of this solenoid being constituted by a coil 78 in the particular wire leading from the electrical source 70 to the proper one of the fingers 52. It will now be apparent that characters corresponding to the studs which are carried by any particular car will be released in order by the closing of the circuits and that these released characters may be used in the customary manner to print a record which will identify the cars as they pass successively past the checking point. It will be evident from Figs. 2 and 5 that when the studs are set for operating in the forward direction of the car, then when the car is run in the opposite direction, the characters will be released in the printing apparatus in reversed order. While it would be apparent from the relative position of the car number and road characters, in which order the record should be read, still it is desirable that the record should always be read in the usual way from left to right. Therefore, in order to effect this result, I prefer to construct my apparatus in the following manner: The plate 24 is provided at diagonally opposite corners with studs 80 and 82, or if the plate 24 is not used, these two studs are attached to the car in the same relative position as regards the studs 30. The stud 80 cooperates with a member 84 rotatably mounted on one end of the rod 40

while the stud 82 coöperates with a member 86 rotatably mounted on the other end of the rod. The members 84 and 86 are similar to the members 44 except in the following particular. The studs carried by these two members instead of being rigid are constructed to yield in one direction on one member and to yield in the other direction on the other member. Referring to the member 84, it will be seen that it carries studs 88 pivoted thereto and held by springs 90 so that the studs may yield in a backward direction but cannot yield in a forward direction. The member 86 on the other end of the rod 40 carries studs 92 pivoted thereto and held by springs 94 so that they may yield only in a forward direction. Therefore, each car when moving in a forward direction will cause the member 84 to turn and complete a circuit while the member 86 will be held stationary by its contact finger engaging a notch in the insulating disk and exerting a greater force to restrain rotation than the force required to stretch the spring 94. When a car moves in reverse or backward direction, the opposite result is accomplished and the member 86 is turned to complete a circuit. Referring particularly to Fig. 7, 96 designates the customary chute of a Mergenthaler machine which has a branch 98 turned toward the left into which the type forming elements are fed to place them in the usual order. Another branch 100 is extended toward the right and a movable member or trap 102 is pivoted at the point where the two branches unite. When the trap is turned to the right, as shown by a full line, the type elements one of which is indicated at T will be fed in the usual manner and when it is turned to the left, as shown by a dotted line, the characters one of which is indicated at T' will be fed into the branch 100 and thus arranged in reverse order. The lower end of the trap extends below the chute and is fitted between the forked end of a lever 104 pivoted at 106 and having a counterweight 108 which serves to throw the trap as soon as the weight moves over the dead center. The lower end 110 of the lever serves as an armature adapted to be attracted by either of the electro-magnets 112 and 114. When the cars are moving in forward direction, the member 84 closes a circuit through the wire 116 so that current flows from the source of electricity to energize the electro-magnet 114 and passes to a ground at 118. The trap is thus maintained in position to cause type forming elements to be arranged in the usual order. When cars are moving in backward direction, the member 86 closes a circuit through the wire 120 so that the electro magnet 112 is energized, the current passing to a ground at 122. This swings the trap into dotted line position and the type

forming elements now pass to the right through the branch 100 so that they are arranged in reverse order. When the record is printed from the type made by casting from the type forming elements, the characters in the record therefore appear always in the same order regardless of the direction in which the cars move.

Fig. 8 shows a modification in which the rotatable elements in the box 34 are replaced by slidable studs 124 adapted to slide in members 126 to which the grounded wire 66 is connected. The lower ends of the studs are reduced and slide in openings in brackets 128 attached to the box. Coil springs 130 surrounding the studs between the brackets and the shoulders on the studs normally hold the latter upwardly. When the studs 30 engage the studs 124, the latter are depressed to contact with the fingers 52 so that a circuit is completed and the key bars of the Mergenthaler are operated in the manner previously described. In this form of invention, in order that the record may be made in the same order regardless of the direction in which the cars are moving, an additional stud is placed at each end of the box for engagement by the studs 80 and 82 previously mentioned. One of these additional studs is indicated at 132 in Fig. 9. The upper ends of these studs are hinged and normally held upright by springs 134, it being understood that the studs at opposite ends of the box are pivoted to swing in opposite directions. The connections with the Mergenthaler are made in precisely the same manner as in the form of apparatus previously described.

In Figs. 10, 11, 12 and 13 there is shown a form of my invention in which instead of providing mechanically movable members to establish the circuits, the circuits are established by making direct contacts. For this purpose the studs 30 on the cars are arranged to engage directly with contact fingers. These fingers are somewhat different from the contact fingers 52 and hence in this form of the invention are designated by the character 136. The free ends of these fingers are provided with wedge shaped heads 138 adapted to be engaged in either direction of the car by the studs 30. The connections of the contact fingers with the Mergenthaler may be precisely the same as previously described. In order to obtain a record printed in the same order regardless of the direction of travel of the cars, the contact fingers at the two ends of the row of such fingers are arranged for engagement by the studs 80 or 82, as shown in Figs. 11 and 12. The two additional contact fingers are designated by the character 140 and each one is provided with a contact head 142 adjacent which is a curved strip of insulating material 144 pivoted at its lower end to 130

the finger and normally held close to the head 142 by a spring 146. When the car is moving forward, as indicated in Fig. 11, the stud 80 engages the head 142, as shown in Fig. 12, the insulating strip yielding to allow the stud to pass. A circuit is completed in the manner previously described and the trap 102 is positioned toward the right. When the car moves in reverse direction the stud slides over the insulating strip 144 as shown in Fig. 13, thereby preventing the closing of the circuit. It is obvious that the contact member and the insulating strip which cooperate with the stud 82 are arranged to operate in the reversed direction from that shown in Figs. 11, 12 and 13.

The operation and advantages of my invention will be apparent from the foregoing description. While intended particularly for use on freight cars, it is obvious that my apparatus can be employed in connection with other vehicles such as passenger cars, automobiles and motor trucks whenever it is desired to check them at selective places. The advantages which result from making an identification record by my apparatus have been stated in connection with the objects of the invention and need not be repeated. Particular emphasis is, however, placed, on the avoidance of errors and the economy of operation as compared with the present system of personal checking. While any suitable printing apparatus may be used to print the record, the Mergenthaler machine furnishes a ready means for obtaining type properly set for printing. It is obvious that the type itself furnishes a record which identifies the vehicles, but in order to obtain a permanent record, the type may be used for printing in the usual manner.

I claim:

1. A recording apparatus comprising operating means associated with a vehicle and adapted to be varied to correspond to characters identifying the vehicle and means located in determined positions adapted to be operated in either direction of travel of the vehicle by said operating means, whereby a record identifying the vehicle may be made automatically.

2. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold selectively positioned elements, the position of which correspond to characters identifying the vehicle and means located in determined positions connected for operation in either direction of travel of the vehicle by said selectively positioned elements whereby a record identifying the vehicle may be made automatically.

3. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a

multiplicity of selectively positioned engaging elements, members located in the roadway for engagement and operation in either direction of travel of the vehicle by said selectively positioned elements and means associated with said members whereby a record identifying the vehicle may be made.

4. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a multiplicity of selectively positioned elements, electrical contact members located in the roadway and operable in either direction of travel of the vehicle for completing circuits corresponding to said selectively positioned elements, means connected with said contact members whereby a record identifying the vehicle may be made and a source of electrical energy for operating said means when the circuits are completed.

5. A recording apparatus comprising a plate containing a multiplicity of holes for the reception of studs and adapted to be secured in fixed position on a vehicle, members located in the roadway adapted for operation in either direction of travel of the vehicle by studs selectively positioned in certain of the holes in said plate and means associated with said members whereby a record identifying the vehicle may be made.

6. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a multiplicity of selectively positioned engaging elements, members located in the roadway adapted for operation in either direction of travel of the vehicle by said selectively positioned elements, and means connected with said members for releasing character elements corresponding to the selectively positioned elements whereby a record identifying the vehicle may be made.

7. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a multiplicity of selectively positioned engagement elements, members located in the roadway for engagement by said elements, means connected with said members for releasing character elements corresponding to the selectively positioned elements whereby a record identifying the vehicle may be made and means for causing said character elements to be arranged in the same order regardless of the direction of travel of the vehicle.

8. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a multiplicity of selectively positioned studs, electrical contact members located in the roadway for completing circuits corresponding to said studs, means connected with said contact members whereby a record identifying the vehicle may be made, means for

causing said record to be arranged in the same order regardless of the direction of travel of the vehicle, and a source of electrical energy for operating both of said means when the circuits are completed.

9. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a multiplicity of selectively positioned studs, electrical contact members located in the roadway and operable in either direction of travel of the vehicle for completing circuits corresponding to said studs, means connected with said contact members for releasing type forming elements corresponding to the selectively positioned studs whereby a record identifying the vehicle may be made, and a source of electrical energy for operating said means when the circuits are completed.

10. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a multiplicity of selectively positioned studs, members located in the roadway for engagement by said studs, means connected with said members for releasing type forming elements corresponding to the selectively positioned studs, a chute into which said type forming elements are delivered, a trap in said chute for directing said type forming elements either to the right or to the left, and means for causing said trap to be positioned according to the direction of travel of the vehicle.

11. A recording apparatus comprising a member secured in fixed position on a vehicle,

said member being adapted to hold a multiplicity of selectively positioned studs, two studs located in diagonally opposite corners of said member, electrical contact members located in the roadway for completing circuits corresponding to said selectively positioned studs, additional contact members also located in the roadway for completing a circuit corresponding to one or the other of said corner studs, means connected with said first mentioned contact members for releasing type forming elements corresponding to the selectively positioned studs, means connected to said second mentioned contact members for causing said type forming elements to be arranged in the same order regardless of the direction of travel of the vehicle, and a source of electrical energy for operating both of said means when the circuits are completed.

12. A recording apparatus comprising a member secured in fixed position on a vehicle, said member being adapted to hold a multiplicity of selectively positioned studs, electrical contact members located in the roadway and operable in either direction of travel of the vehicle for completing circuits corresponding to said studs, key bars of a printing machine arranged to correspond with said contact members, and means associated with each of said key bars whereby it is operated when the circuit is completed through the corresponding contact member.

In testimony whereof I hereunto affix my signature.

GIBSON L. DOUGLASS.