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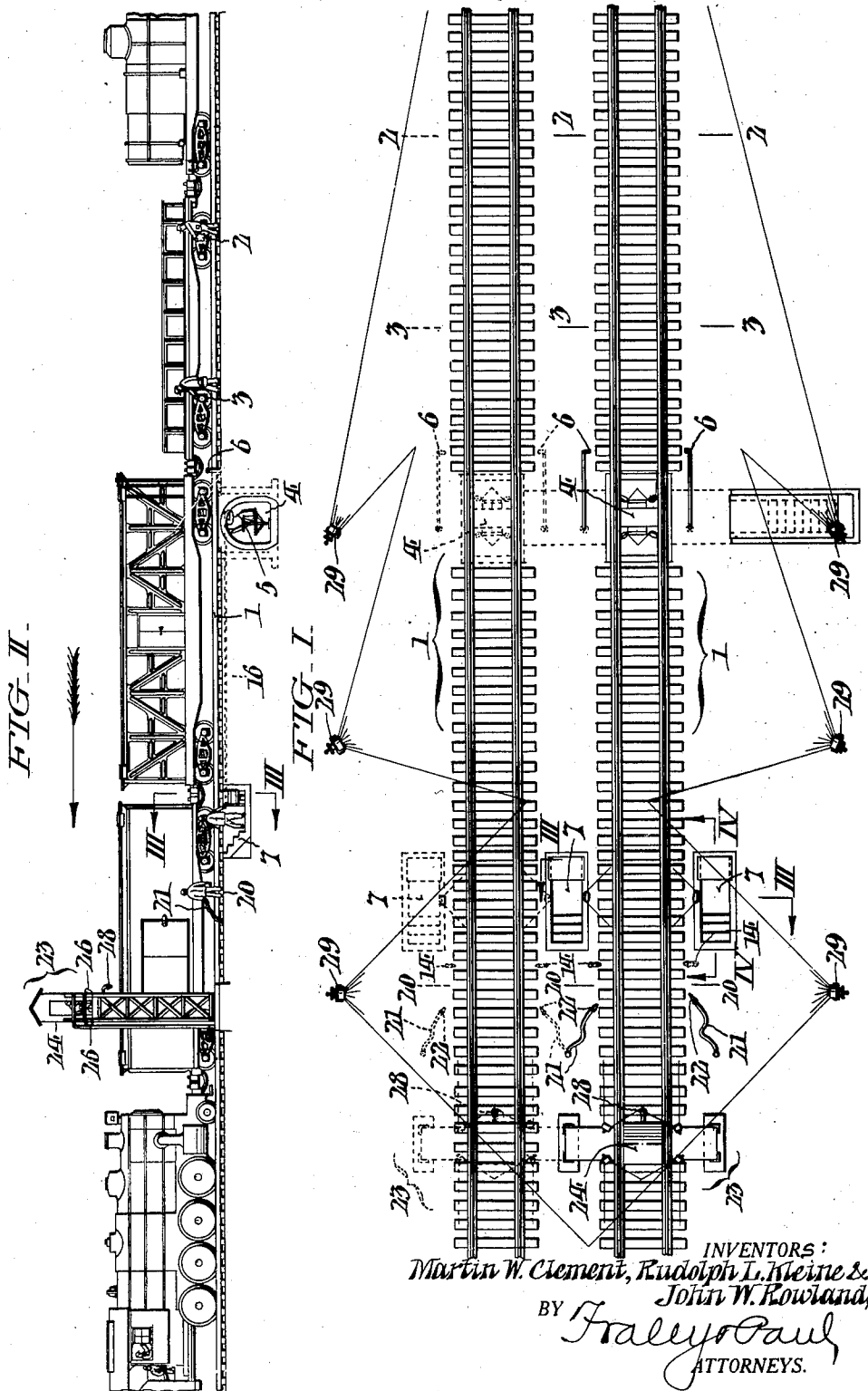
M. W. CLEMENT ET AL

**1,977,170**

METHOD OF INSPECTING RAILROAD CARS AND APPARATUS THEREFOR

Filed Sept. 19, 1932

4 Sheets-Sheet 1



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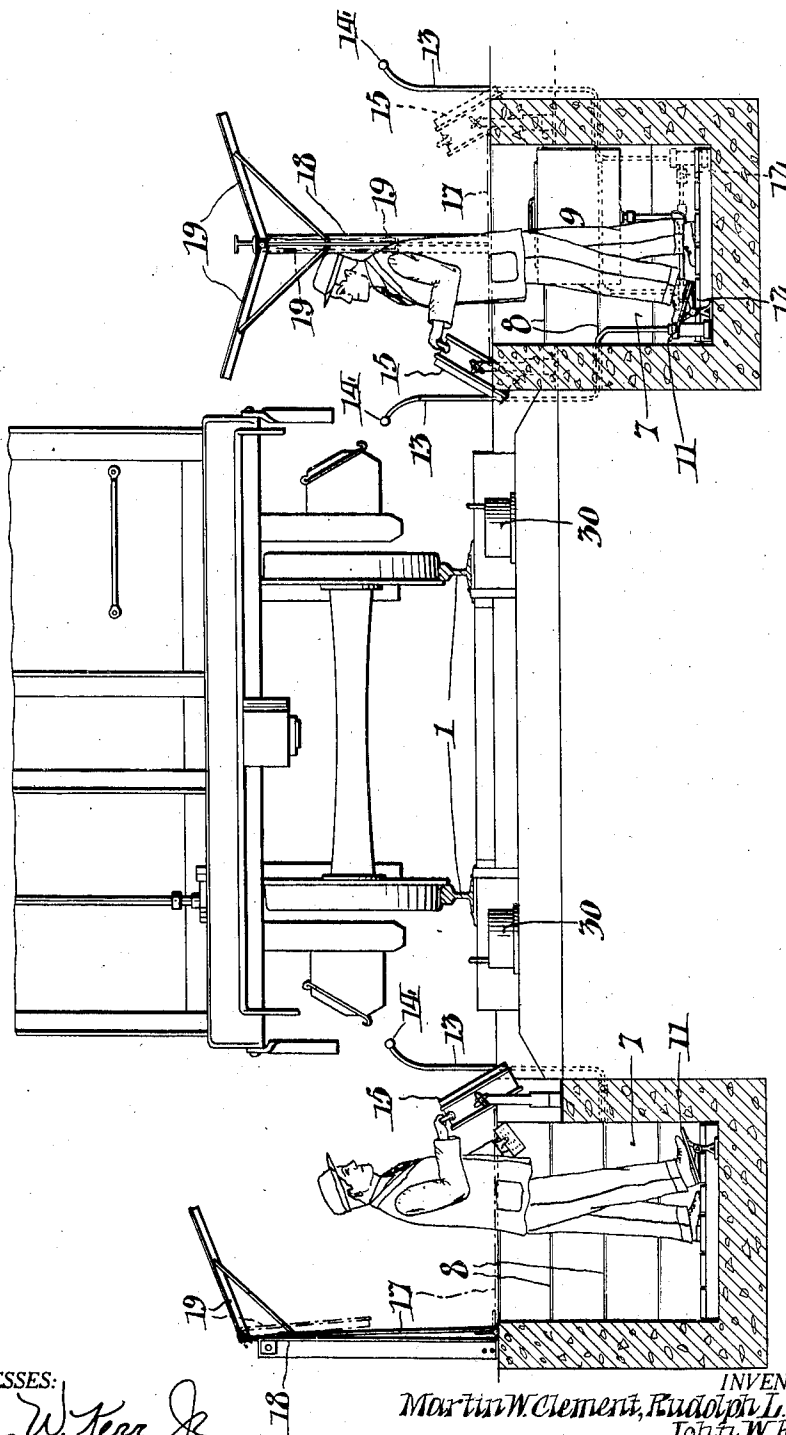
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FIG. III.



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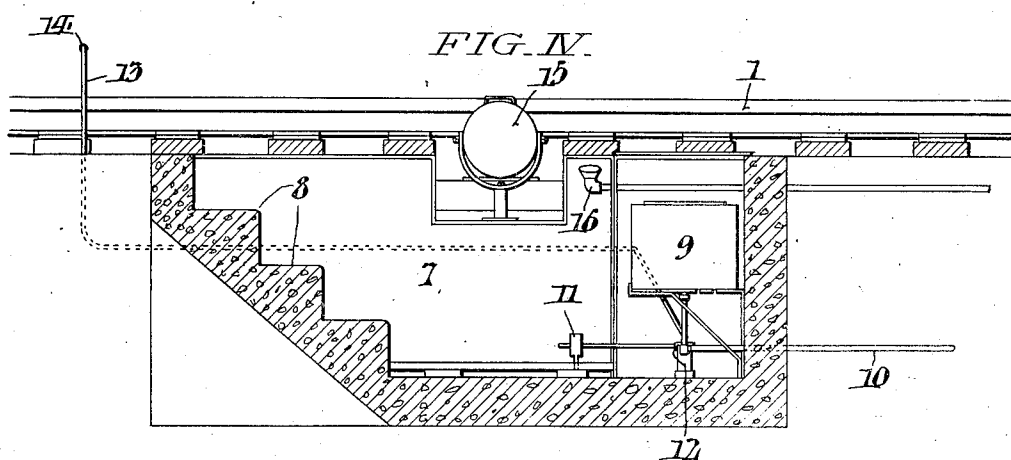
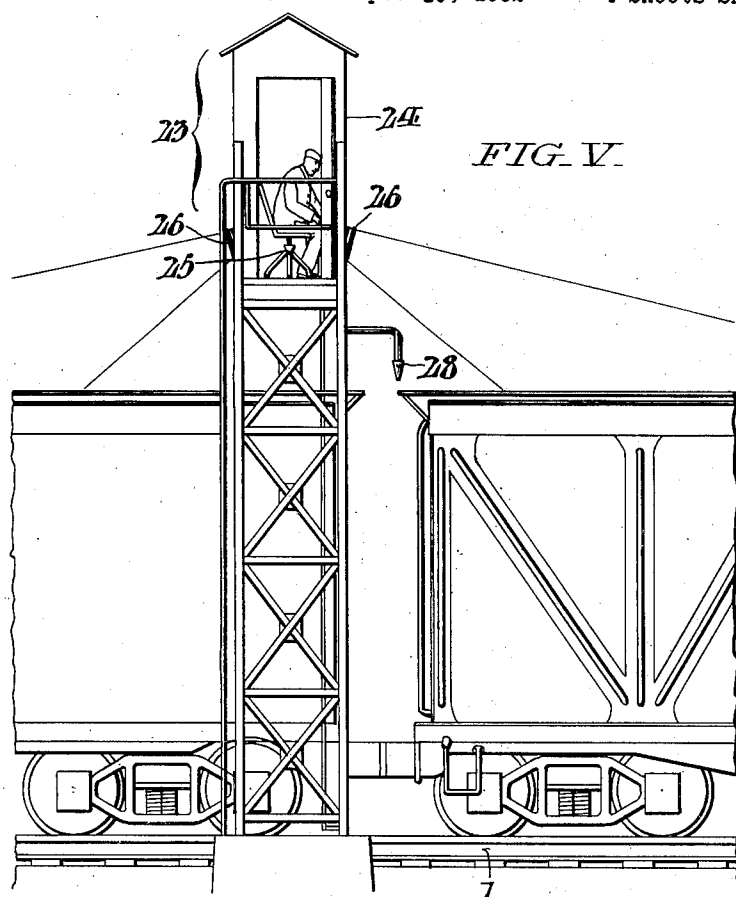
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4 Sheets-Sheet 3



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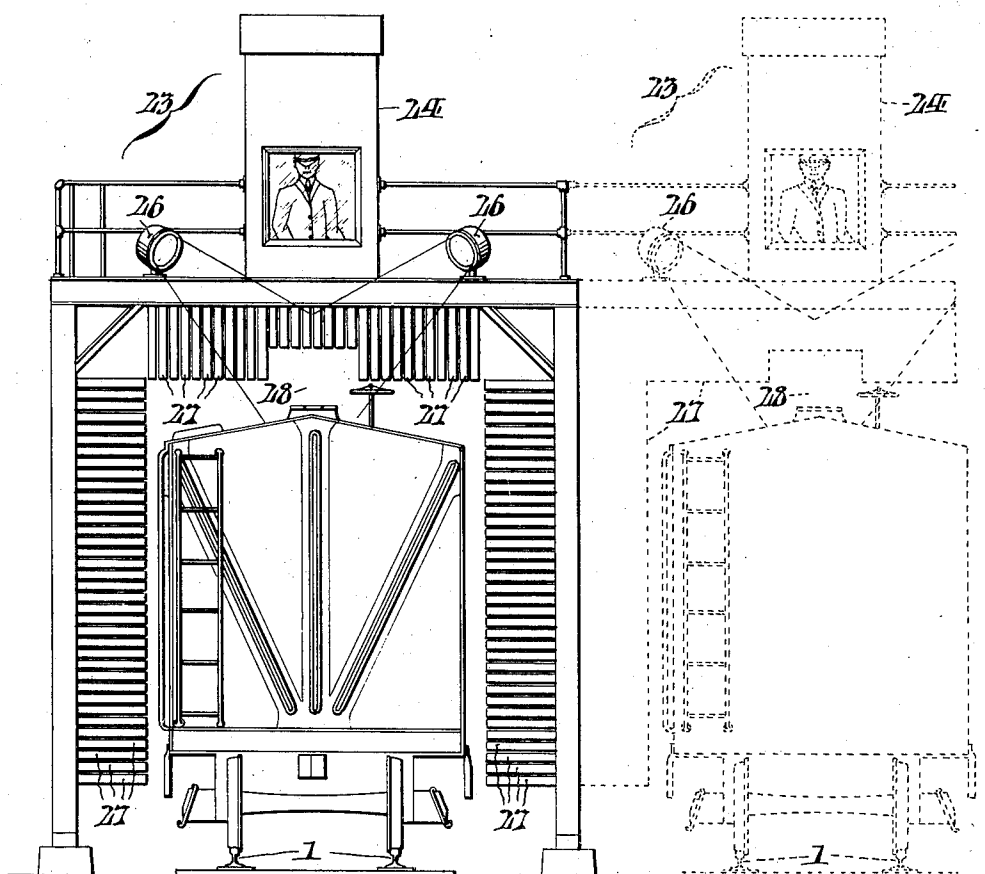
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4 Sheets-Sheet 4

FIG. VI.



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## UNITED STATES PATENT OFFICE

1,977,170

METHOD OF INSPECTING RAILROAD CARS  
AND APPARATUS THEREFORMartin W. Clement, Haverford, Rudolph L. Kleine,  
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Application September 19, 1932, Serial No. 633,702

4 Claims. (Cl. 104—26)

This invention relates to a method of inspecting railroad cars while the same are moved slowly in groups along a track, as well as to apparatus designed to facilitate such an inspection. The invention is especially useful when applied to the inspection of freight cars moving from a receiving yard to a classification yard, and it affords an inspection by which a great variety of defects which constitute common causes of accidents may be detected, and their location noted so that they may be subsequently remedied.

Generally stated, the object of our invention is to provide an inspection of cars in active service which is sufficiently comprehensive in its scope to cover substantially all visible defects which are likely to cause train wrecks or serious accidents. In U. S. Letters Patent No. 1,793,908, granted to Martin W. Clement February 24, 1931, there is shown and described a method and apparatus for making an underneath inspection of passing cars as they move slowly over a pit. Differing from the method there disclosed, our present invention contemplates a series of examinations of passing cars, conducted substantially simultaneously according to a predetermined plan, with each examination covering a particular area of each car, and with the several examinations collectively covering substantially the whole of each car.

Other more specific objects and advantages characteristic of our invention will become apparent from the description of an example of the practice thereof, which follows hereinafter, having reference to the accompanying drawings. Of the drawings:

Fig. I represents a plan view of a section of track equipped with apparatus of our invention.

Fig. II represents a side elevation of the same, showing a train of freight cars undergoing inspection.

Fig. III represents an enlarged transverse section of the side pits, taken as indicated by the lines III—III of Figs. I and II from which stations the sides and ends of the cars are inspected.

Fig. IV represents a longitudinal cross section of the same, taken as indicated by the lines IV—IV of Fig. I.

Fig. V represents an enlarged side elevation of the bridge constituting the station from which the roofs of passing cars are inspected and at which side and vertical clearance of the cars and their lading is measured; and,

Fig. VI represents a front elevation of the same. With reference particularly to Figs. I and II of the drawings, there is shown a group of freight cars being moved in the direction indicated by the

arrow, and it may be assumed that the cars thus shown are cars in active service which have come from the main line tracks of a railroad system into a receiving yard, and that from there they are being hauled to a classification yard. Incident to such movement, the cars pass by a series of inspection stations located at spaced intervals along a track. In the present example of our invention the inspection is conducted along parallel tracks 1, each equipped with a set of inspection stations.

The first of the series of inspection stations is designated at 2. At this station two men stand, one on each side of the track, immediately adjacent thereto. As the cars pass by, at a slow uniform rate of speed, preferably at the rate of about two miles per hour, each man opens the journal box lids and hooks with a suitable tool for waste grabs that may be under the bearings of the journal boxes interfering with proper distribution of the lubricant. At the same time the journal boxes are visually examined, care being taken to see that each journal box of each truck is subjected to the same examination.

At a point further along the track, and conveniently about one car's length from the initial inspection station, there is a second station designated at 3. At this station two men, one on each side of the track and adjacent thereto, set up the packing in the previously opened journal boxes.

In advance of the second station there is an underground inspection pit 4, of the type shown in the Clement Patent No. 1,793,908, referred to above. Within the pit 4 a man is seated on a swivel chair 5 in a position such as to command a view lengthwise of the track in both directions, from which the running gear and other under parts of the passing cars may be readily examined. The man in the underground inspection pit 4 makes a thorough inspection of each car for such defects as cracked arch bars, bent or broken center sills, loose wheels, defects in the brake rigging, or defects in any of the other equipment suspended from the bottom of the cars. By means of a hand valve or other suitable control apparatus, not shown, the man in the pit 4 operates a spray marking device to cause a jet of white-wash or the like to issue from a nozzle 6 to mark defective cars as the defects are observed.

At about one car's length in advance of the inspection pit 4, there is a station comprising two side pits 7 disposed on each side of the track. The side pits 7 are conveniently termed "half-depth" pits because the bottom of each pit is at such a level that a man standing therein views the trucks of passing cars at substantially the level

of his eye. The side pits 7 are preferably of concrete construction with steps 8 leading downward thereto, and each pit is equipped with suitable marking apparatus for identifying defective cars.

5 In the particular example illustrated, this apparatus comprises generally a storage tank 9 for whitewash or other marking fluid, an air supply line indicated at 10 in Fig. IV, and a foot treadle 11 for controlling the operation of a three-way valve 12 which in turn controls the discharge of the whitewash to a pipe 13.

The pipe 13 terminates in a spray nozzle 14 from which a spray of whitewash is delivered to the trucks of passing cars. The spray from the 15 nozzle issues at a point above the level of the spray from the nozzle 6 previously described in connection with the underground inspection pit, and accordingly the location of the mark upon the car serves to indicate whether the defect relates

20 to the underpart or to the side of the car. At each half-depth pit 7 there is provided a search light 15 mounted for swinging movement at the edge of the pit and adjustable so that its rays will be thrown upon the sides of the truck frames 25 and other gear suspended at the sides of the car.

From each side pit 7 a speaking tube 16, shown in Fig. IV, leads to the underground inspection pit 4 permitting the men in the side pits to be in constant communication with the man in the 30 underground pit. Obviously, other means of communication may be provided, it being important that the various stations be in communication with each other so that if the man at the underground inspection pit 4 is uncertain as to whether

35 he sees a defective part and the part may be more clearly seen from the side than underneath, he may then notify the men in the side pits to be on the lookout for such defect. Inasmuch as the pits are located at about one car's length 40 from the underground pit, after the man in the underground pit has warned one of the men in the side pits to be on the lookout for a defect, the latter will know that the defect is one on the car which is just about to pass his station. Each

45 side pit 7 is covered when not in use by a hinged cover 17. When the pit is to be used, the hinged cover 17 is swung upwardly as indicated in Fig. III, and is locked to an upright support 18 at the rear of the pit. Pivotaly attached to the upright support 18 there is a collapsible canopy 50 19. When the parts of this canopy are extended to the position shown in full lines in Fig. III, the canopy together with the cover 17 forms a shelter for the man in the pit. When the parts of the canopy are collapsed, the pit cover 17 may be

55 swung downward with the canopy housed therebeneath. The collapsed position is indicated by the dot-and-dash lines in Fig. III.

The inspection conducted by the men in the 60 half-depth side pits 7 consists of the examination of the trucks and such parts of the brake rigging and other gear suspended from the bottom of the car as may be visible from the side. The examination also covers the side walls of the cars, it being the duty of the men in the half-

65 depth pits to note such defects as loose side doors, broken side ladders or the absence of safety appliances. The examination also includes the end walls of the cars which are visible for a moment as the car passes the pits.

At a point in advance of the half-depth side pits 7, there is a station 20 at which two men are located, one at each side of the track, from 70 which oil may be injected into the journal boxes previously opened at the first station 2 of the

series. The men at the oiling station 20 have available flexible hoses 21 with nozzle controls 22; and they oil the journal boxes as required. In cold weather it is frequently desirable to inject into the journal boxes freshly heated oil 80 which will free so-called "frozen bearings", so that the cars will run more smoothly. This is most desirable where the cars are to be passed over a yard hump from which they roll by their own weight into the classification yard. At the oiling station 20 the journal box lids are closed. 85

Beyond the previously described station 20 there is a bridge 23 which comprises the final station of the series. The bridge 23 consists of an inverted U-shaped framework having a cabin 90 24 at the top thereof in which a man is seated on a swivel chair 25. The man is seated centrally of the track 1, and while he may view the track in both directions, he generally observes the cars as they pass toward the bridge and notes such defects as broken running boards, loose ventilators and the like. For this inspection he has available search lights 26 which play upon the roofs of the passing cars in both directions.

The bridge 23 also serves as a clearance tower. 100 For this purpose there are provided swinging tabs or slats 27, as shown in Fig. VI, arranged in vertical rows at the sides of the framework and in a horizontal row suspended from the top thereof. As long as the tabs or slats 27 remain untouched, 105 the vertical and side clearance is not exceeded. If, however, there is a loose door, or if the lading projects outwardly to exceed the clearance limits, the projecting article will strike one of the tabs or slats 27, and record to the view of the man in the cabin 24, by means of a suitable indicator, not shown, the point at which the clearance limit is exceeded. There is also preferably provided a bell, not shown, or similar warning alarm to notify the man in the cabin 24 that the clearance 115 limit has been exceeded. Whenever vertical or side clearance is exceeded, or whenever a defect is noted in the roofs of passing cars, the man in the cabin 24 operates a spray nozzle 28 to mark the defective car. The operation of the spray 120 nozzle 28 is accomplished in a similar manner to the operation of the previously described nozzles 6 and 14 at the underground and side pits respectively. Where two or more parallel tracks are utilized for the inspection the bridge 23 may be 125 duplicated over each track as indicated by the broken lines at the right-hand side of Fig. VI.

There is also provided a series of additional flood lights 29 located at some distance from the track 1 and collectively covering the whole series 130 of inspection stations, these lights being useful for the purpose of night inspection. Moreover, as shown in Fig. III, stationary lights 30 are preferably located outside the rails of the track 1 at positions where their rays are thrown upward 135 to illuminate the truck frames of passing cars. It will be particularly observed that the several inspection stations are located adjacent to each other so that the inspection of all parts is substantially simultaneous, and that the major stations of the series, to wit the underground inspection pit 4, the side pits 7, and the overhead bridge 23 are located at about one car's length apart. Accordingly, the view from each of these stations is not obstructed by the structure of the 145 other stations, though the stations are in such proximity to each other that when defects are noted and communicated from one station to another there will result no confusion as to which car of the train is referred to. 150

The method of conducting the complete inspection of this invention will be apparent from the description of the individual operations which take place at the several stations of the series. It will be particularly noted that the aggregate of the various individual examinations of particular areas of the cars constitutes a comprehensive examination of substantially all parts of the cars, so that all defects visible from below, from above, or from the sides or ends of the cars, may be noted. Where such defects are noted, the various marking devices serve to identify the location of the defects so that when the cars subsequently reach the classification yard, the defective cars may be segregated, and the repair men will be apprised in a general way of the location of the defect which is to be remedied. Furthermore, it will be especially noted that the close proximity of the inspection stations enables substantially simultaneous inspection of each car, and that the stations are inter-communicating and so positioned that one inspector may call to another, either through the speaking tubes or over the ground. This renders possible effective team-work between the several inspectors so that the complete inspection constitutes not merely the aggregate of the individual examinations of the cars from each station, for by the co-operative action of the inspectors many defects can be ascertained which would otherwise pass unnoticed.

While we have described one example of the practice of our invention, and one particular set of apparatus useful for facilitating such an inspection, it will be apparent that various changes may be made in the form of the apparatus to be used; that changes may be made in the order of the individual examinations to which the cars are subjected; and that certain features of the invention may be used at times to advantage without a corresponding use of other features, all without departing from the spirit of our invention as defined in the claims hereto annexed.

Having thus described our invention, we claim:

1. A method of comprehensively inspecting railroad cars which consists in moving the cars slowly and successively past a series of inter-communicating inspection stations from each of which a different area of the car is visible, one such inspection station being located at a level beneath the track, another at a level above the tops of the cars, and other being located at intermediate levels at the sides of the track, and examining each car from each station as it passes thereby, said inspection stations being sufficiently near each other to admit of substantially simultaneous inspection of the entire car, the facilities at each inspection station enabling an inspector to examine therefrom a particular area of each car and note defects, and the total area thus inspected embracing substantially all of each car, whereby all of its visible defects may be noted, and marking for identification such cars as are defective, with the marks applied in the general vicinity of the defective condition.

ties at each inspection station enabling an inspector to examine therefrom a particular area of each car and note defects, and the total area thus inspected embracing substantially all of each car, whereby all of its visible defects may be noted.

2. In combination with a railroad track, a half-depth inspection pit at the side of the track, the floor of said pit being at such a level that a man standing therein views passing cars substantially at the level of the journal boxes, a hinged cover for said pit and a collapsible canopy on said cover, said canopy being extensible whereby when the cover is raised the cover and canopy together afford a shelter for the man in the pit.

3. In combination with a railroad track, a series of inter-communicating inspection stations, one such inspection station comprising a pit located at a level beneath the track, another such station being located above the level of the tops of railroad cars, and other such stations comprising half-depth pits at the sides of the track from which the trucks of passing cars may be conveniently examined, said inspection stations being sufficiently near each other to permit substantially simultaneous inspection of the cars as they pass by, and said inspection stations being so arranged that the inspectors therein may collectively view substantially the entire area of each car as it passes, and means at each said inspection station for applying marks to defective cars in such manner as to identify the general location of the defective condition.

4. A method of comprehensively inspecting railroad cars which consists in moving the cars slowly and successively past a series of inter-communicating inspection stations from each of which a different area of the car is visible, one such inspection station being located at a level beneath the track, another at a level above the tops of the cars, and others being located at intermediate levels at the sides of the track, and examining each car from each station as it passes thereby, said inspection stations being sufficiently near each other to admit of substantially simultaneous inspection of the entire car, the facilities at each inspection station enabling an inspector to examine therefrom a particular area of each car and note defects, and the total area thus inspected embracing substantially all of each car, whereby all of its visible defects may be noted, and marking for identification such cars as are defective, with the marks applied in the general vicinity of the defective condition.

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