Oct. 17, 1933. T. A. MACKIN 1,931,444

VEHICLE WASHING AND POLISHING APPARATUS

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Fig. 1.

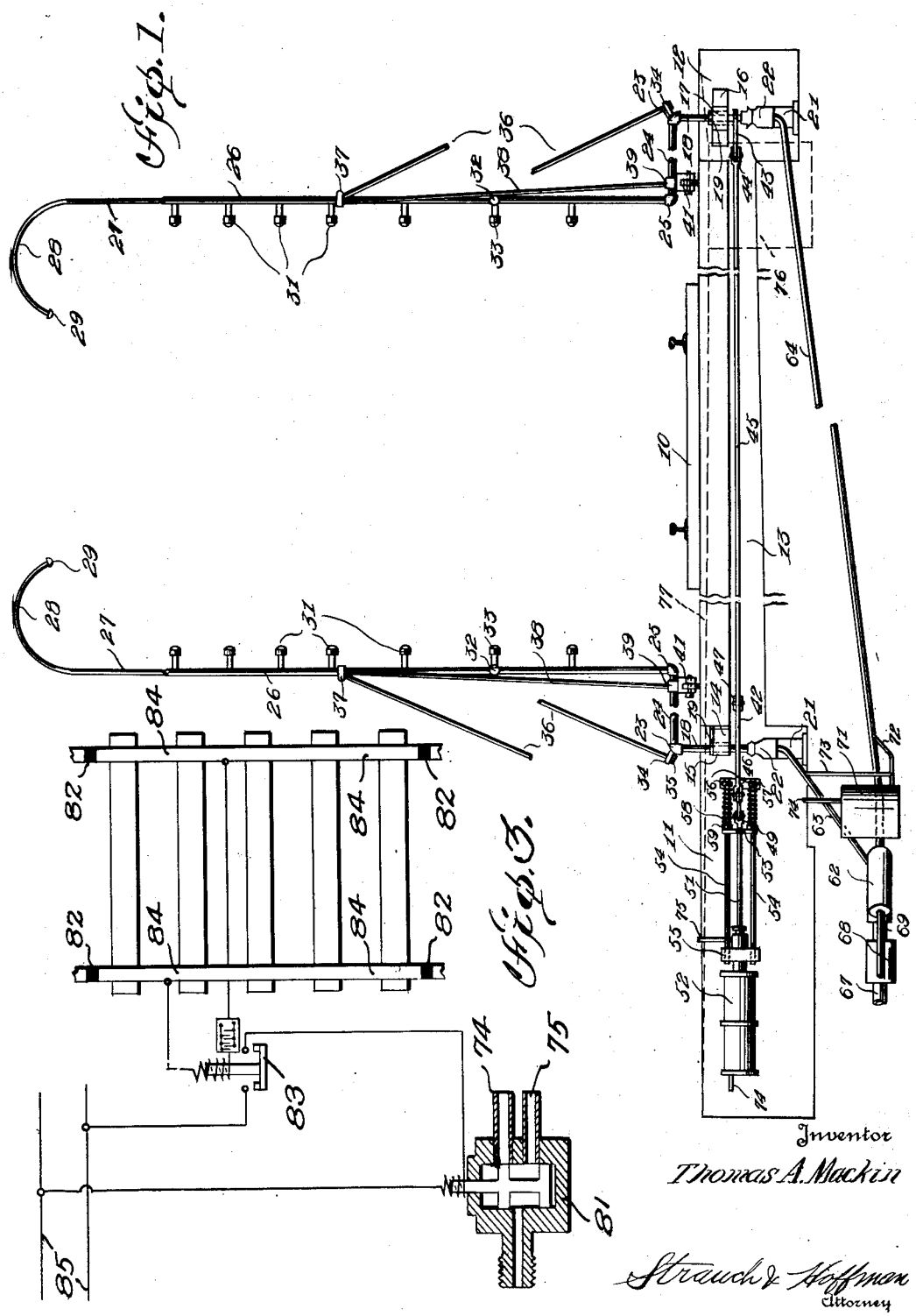


Fig. 3.

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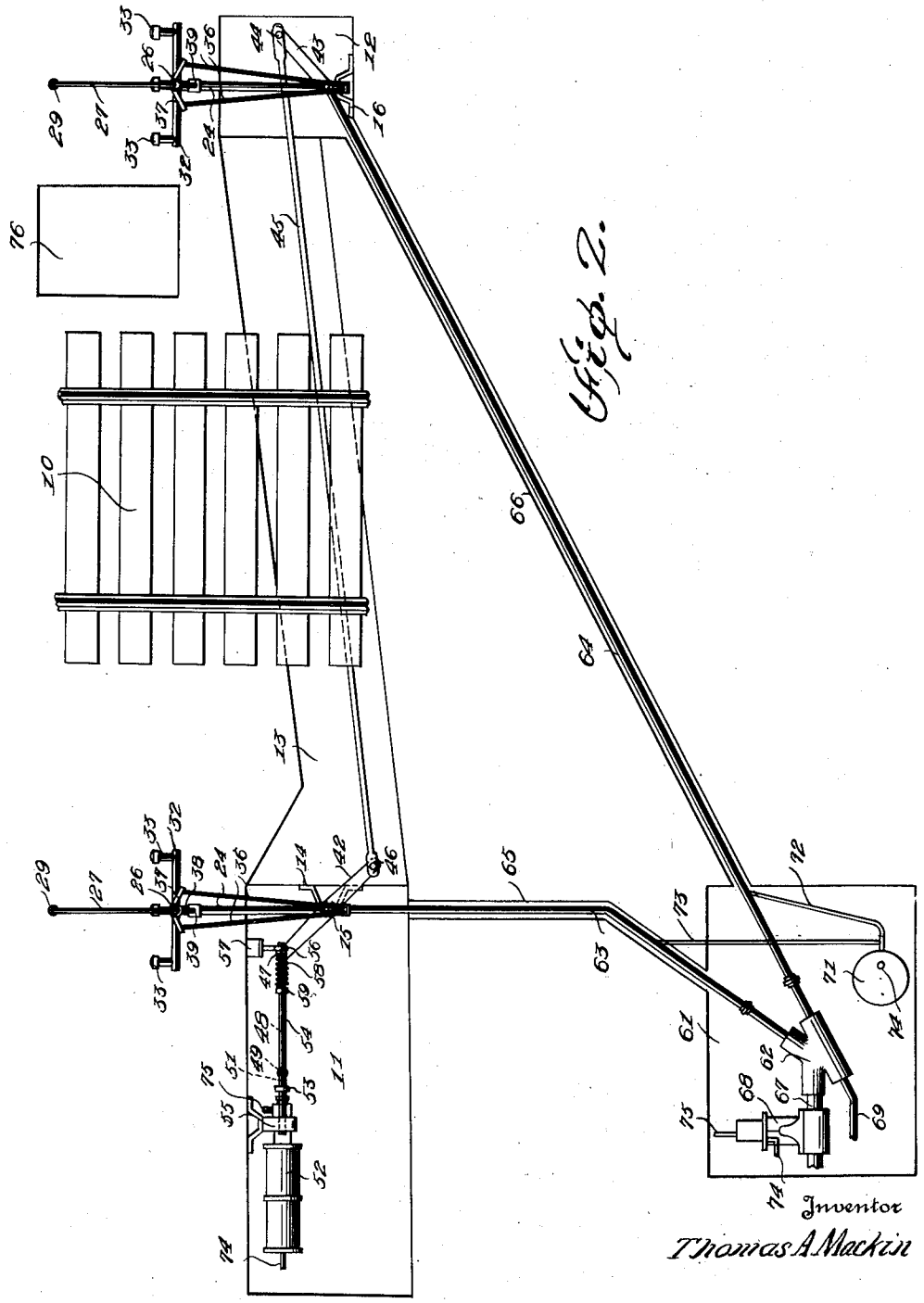


Fig. 2.

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VEHICLE WASHING AND POLISHING APPARATUS

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Application February 7, 1929. Serial No. 338,211

14 Claims. (Cl. 141—1)

The present invention relates to an apparatus for washing and polishing vehicles and in the preferred embodiment particularly adapted to washing locomotives. A novel method involving the use of an apparatus having characteristics in common with the machine of this application is described and claimed in my copending application Serial No. 448,137 filed April 28th, 1930.

Locomotives, in operation become covered with dust, soot, and grease which due to the comparatively high speed of operation become packed in the numerous channels and spaces between the various mechanisms entering into the locomotive constructions. Due to the oily or greasy surfaces of the various parts of locomotives the dust, soot and dirt firmly adhere thereto making it quite a laborious operation to thoroughly remove such dust, soot and other foreign matter and to polish the large exterior surfaces. The removal of such foreign matter is rendered more difficult in cold weather when locomotives become covered with ice and sleet which must be removed prior to the cleaning and polishing operations.

It is important that locomotives be kept in a clean condition for the sake of appearance which in itself is an important consideration, but also to secure maximum operating efficiency, to insure visibility of the parts for inspection, and to reduce maintenance costs to a minimum.

The most effective method heretofore employed for washing locomotives consists in subjecting them manually to a stream of water and steam at a high pressure directed against the surfaces to be cleaned from a hose equipped with a spray nozzle and manipulated manually by an operator. This method of washing locomotives is time consuming, laborious, more or less inefficient and expensive.

Therefore a primary object of my invention is the provision of novel apparatus for the effective removal of accumulated foreign matter on vehicles with a minimum expenditure of time and expense.

Another object of the present invention is the provision of an automatic apparatus for washing locomotives comparatively simple and inexpensive in construction and operation which rapidly and effectively washes locomotives and other vehicles leaving them in clean and polished condition.

With the above objects in view as well as others that will become apparent from the following disclosure and the terms of the appended claims, reference will be had to the accompanying drawings forming part of same and illustrating a preferred embodiment of apparatus for carrying my improved method into effect and wherein

Fig. 1 is an elevational view of a preferred embodiment of my improved apparatus installed adjacent to, and as seen in the direction of, a rail track, the operating mechanism pits, being illustrated more or less diagrammatically and some parts being broken away.

Fig. 2 is a top plan view of the apparatus, more or less diagrammatic in character.

Figure 3 is a diagrammatic view of a form of control for my apparatus.

Referring to the drawings by reference characters, in which like characters designate like parts, 10 designates a section of track upon which locomotives are run from an adjacent turntable and back again to undergo the washing operation.

Formed at one side of the track 10 and closely adjacent thereto is a pit 11 and at the opposite side of track 10 substantially in transversely disposed relation to pit 11 is a second smaller pit 12 in communication with pit 11 through a passage 13. Suitably supported by a wall of pit 11 is a bracket 14 provided with a bearing 15 and supported by a wall of pit 12 is a bracket 16 provided with a bearing 17. Rotatably journaled in each of the bearings 15 and 17 is a vertically disposed pipe sections 18 provided with a bearing collar 19. Supported by a bracket 21 in each pit 11 and 12 is a suitable water tight joint or connection 22 provided with an upper rotatable and lower stationary pipe connection of any well known form, to the rotatable part of which the lower ends of the respective pipe sections 18 are secured thus permitting rotation of each pipe section 18 while maintaining a fluid tight joint.

Secured to the upper end of each pipe section 18 by means of an L-coupling 23 is one end of a horizontally disposed pipe section 24 whose opposite end is connected by means of a similar coupling 25 to the lower end of a relatively long vertically disposed pipe section 26 to the upper end of which is secured the lower end of a pipe section 27 of substantially reduced diameter and which as indicated in Fig. 1 is provided with an arcuate section 28 having a downwardly and inwardly facing terminal thereof provided with a suitable spray nozzle 29 which ejects a dispersed spray that washes the tops and sprays the front and rear ends of vehicles to be washed in a manner that will more fully hereinafter appear.

Each pipe section 26 is provided with a vertical series of horizontally extending nozzles 31 which as indicated in Fig. 1, are in closer spaced

relation adjacent the top of the pipe section than at the bottom thereof for a purpose later referred to. Each pipe section 26 is further provided with a lateral branch pipe connection 32 provided with spray nozzles 33 located at a height above the ground to thoroughly impinge upon the running gear of the locomotive or other vehicle.

Each coupling 23 is provided with an apertured lug 34 to which is secured by means of nuts 35 the inner ends of a pair of guy rods 36 which diverge therefrom to the outer ends thereof in turn suitably secured to a bracket 37 secured to pipe section 26 intermediate the ends thereof for the purpose of strengthening and steadying section 26.

In order to further brace or steady each pipe section 26 a third guy rod 38 is secured at the outer end thereof to bracket 37 and at the inner end thereof to a bracket 39 suitably secured to pipe section 24 adjacent the connection thereof with the lower end of pipe section 26, and each bracket 39 is provided with a wheel or caster 41 upon which the outer ends spray nozzle assemblies are rolled. The spray nozzle assemblies 26 are adapted to swing through an angle of 90° from and to the inoperative position indicated in Fig. 2, and means are accordingly provided to cause rotation thereof which comprises the following mechanism.

Secured to pipe section 18 in pit 11 is the intermediate portion of a lever 42 and secured to pipe section 18 in pit 12 is one end of a lever 43 whose opposite end is pivoted connected at 44 to one end of a rod 45 extending through passage 13 with the opposite end thereof pivotally connected to one end of lever 42 as indicated at 46.

Pivotally connected at 47 to the opposite end of lever 42 is one end of a link 48 the opposite end of which is pivotally connected at 49 to the outer end of a piston rod 51 the inner end of which is provided with a piston reciprocably movable in a cylinder 52 suitably supported in pit 11. Piston rod 51, adjacent its pivotal connection 49 has secured thereto the intermediate portion of a cross bar 53 the opposite ends of which are apertured for slidable connection with parallel guide rods 54 disposed on opposite sides of rod 51 with corresponding ends fixed in a bracket 55 and the opposite ends fixed in collars 56 carried by a bracket 57.

Disposed on each rod 54 with one end thereof in engagement with collar 56 individual thereto is a coil spring 58 the opposite end of which is engaged by a collar 59 longitudinally movable on the rod 54 individual thereto, the collars 59 and bar 53 being so disposed that upon forward movement of bar 53 collars 59 will be engaged thereby just prior to full active position of members 26 whereby springs 58 will be slightly compressed thus providing a cushioned stop for the forward movement of piston rod 51.

A third pit 61 is provided as shown in Fig. 2, adjacent pit 11. As shown in Figure 1 pit 61 is deeper than pit 11 to more clearly illustrate the construction, but it will be understood that pits 61 and 11 may be of the same depth if desired.

Located in pit 61 is a four way mixing connection 62, to adjacent branches of which are secured adjacent ends of a pair of pipes 63 and 64 extending through passages 65 and 66 which interconnect pit 61 with pits 11 and 12 respectively. The opposite ends of pipes 63 and 64 are suitably connected to the lower stationary parts of joints 22. Connected into a third branch of connection 62 is one end of a water line 67 provided with a valve pneumatically operable by means of a pneumatic piston and cylinder mechanism of any suitable construction indicated at 68 associated with water line 67. Connected into the fourth branch of connection 62 is one end of a steam line 69 provided with a suitable regulating valve which if desired may also be operated by the mechanism 68.

Arranged in pit 61 is an oil tank 71 which adjacent the bottom thereof is connected with pipe 64 by means of a smaller pipe 72 and pipe 72 is provided with a branch pipe connection 73 in communication with pipe 63.

A pair of pressure air lines 74 and 75 are provided, the former of which is by suitable branch connections in communication with one end of cylinder 52, mechanism 68 and oil tank 71, and the latter of which is in communication with the opposite end of cylinder 52, and mechanism 68.

A suitable water draining and oil reclaiming pit 76 is provided and as indicated by dotted line 77 in Fig. 1, the surface adjacent the apparatus is sloped toward the pit in order that the water used in washing operations will readily drain into pit 76 where the oil injected into the washing water from tank 71 may be permitted to separate by settling and siphoned off the top of the water in pit 76, and again used for further washing operations, while the water and dirt at the bottom of the pit 76 may be drained off through suitable pipes (not shown) and discharged into a sewer.

The surface adjacent the apparatus may be paved or concreted to provide a water tight surface, and if desired pits 11, 12 and 61 which are preferably normally covered may be provided with marginal ledges to prevent the admission of waste water thereto.

While draining pit 76 is shown adjacent pit 12 it may be located at any other suitable point or if desired a second draining pit may be provided adjacent pit 11.

In operation of my improved apparatus for washing locomotives, the locomotives to be washed are driven from an adjacent turn table or other location onto track section 10 whereupon a valve controlling airline 74 is opened as the locomotive approaches pipe sections 18. As a result air under pressure admitted into cylinder 52 forces rod 51 forwardly by action of the pneumatic pressure on a piston within cylinder 52. Movement of rod 51 swings lever 42 through an angle of 90° or from the inoperative position indicated in Fig. 2 to the operative position indicated in Fig. 1 and as rod 51 approaches the limit of its forward movement bar 53 carried thereby and which is in slidable engagement with rods 54 will engage collars 59 placing springs 58 under slight compression thus providing a cushioned stop for rod 51. In this position as illustrated in Fig. 1, pipe sections 26 are disposed relatively close to track section 10. As sections 26 are rotated from their inoperative to and from their operative positions they are further supported on the casters 41 which travel in an arc of a circle upon a smooth hard surface surrounding the apparatus.

As indicated in Fig. 2 sections 26 in inoperative position are disposed at a substantial distance from track section 10 in order to minimize chances of injury to persons riding on or working about locomotives. However sections 26 may be permanent disposed in the position shown in

Figure 1 thus eliminating the operating mechanism above referred to.

In the operative position as shown in Figure 1 nozzles 31 and 33 are directed toward the opposite sides of the locomotive with the latter nozzles disposed substantially opposite the running gear and with nozzles 29 disposed in downwardly and inwardly inclined position, over the top of the locomotive.

Simultaneously with the movement of sections 26 to operative position the valve in water line 67 is opened by the action of pneumatic pressure in the operating cylinder of mechanism 68, and oil is forced through pipes 72 and 73 into pipes 63 and 64 as a result of the connections of airline 74 with cylinder 52, mechanism 68 and oil tank 71. At this time steam is preferably admitted through line 69 into connection 62 by manipulation of a suitable valve which, if desired, may also be actuated by mechanism similar to 68 in order to provide simultaneous admission of water, oil, and steam, into pipes 63 and 64 under substantial pressure. It will also be obvious that if desired the water, oil and steam may be regulated by separate valves, should it be desired to carry out the washing operations by different combinations of the three washing media.

Upon the admission of water, steam, and oil into pipes 63 and 64 under high pressure the washing agent formed thereby flows through pipe sections 18, 24, 26, 32 and 27 and thence through the nozzles 31, 33 and 29 under high pressure and is forced in a spray against the opposite sides, front and rear, as well as the top of the locomotive, nozzles 29 ejecting sprays against the top of the locomotive and nozzles 31 and 33 ejecting sprays against the opposite sides of the locomotive. As will be noted a plurality of sprays from nozzles 33 are directed horizontally against the running gear of the locomotive which are the most difficult parts to clean.

As the locomotive is being washed the oil mixed with the water coats and polishes the surface thereof, and waste water drains into pit 76 from which the oil carried thereby can be reclaimed by siphoning off the surface of the water for further use in other washing operations.

During a washing operation, the locomotive is moved slowly in one direction past the opposite pipe sections 26 through a distance of the length of the locomotive and may then be moved in the reverse direction subjecting the surfaces to two or more applications of the spray from nozzles 29, 31 and 33 the operations being carried out in a relatively short period of time. Due to the multiplicity of nozzles, the nature of the washing medium, and the high pressure under which it is ejected the locomotive may be thoroughly cleaned and polished in a single movement past the sprays thus making possible the efficient washing of locomotives with an expenditure of minimum time, labor, and expense.

Upon the completion of washing operations air pressure is cut off lines 74, and a valve controlling air line 75 is operated which causes movement of the piston in cylinder 52 in the opposite direction thus moving pipe sections 26 to their inoperative position illustrated in Fig. 2. Simultaneously with restoration of sections 26, the valve in water line 67 is closed through mechanism 68 and steam line 69 is either separately closed or simultaneous with water line 67 if connected with mechanism 68.

Instead of controlling the admission of operating air pressures to lines 74 and 75 manually these lines may be provided with electrically or mechanically operated mechanisms controlled by the locomotive position on tracks 10 to automatically control operation of the operating mechanisms 52 and 68, and the application of air pressures to oil tank 71. As seen in Figure 3, an electrically operated valve 81 in air lines 74 and 75 may be provided and controlled from track sections separated by insulating blocks 82 from the remaining track at or adjacent the washing positions, to alternately supply air pressures to pipes 74 and 75, to initiate washing operation when a locomotive approaches washing position, and to cut off the washing operation as the locomotive leaves the washing position.

As seen in Figure 3, the relay 83 is closed when a locomotive bridges the insulated track sections 84 to thus energize the circuit including the electrically operated valve 81, current for this circuit being supplied from the power or lighting lines 85. When valve 81 is pulled up the pressure fluid passes to the pipe 74 to turn the washing pipes transverse to the track and open the washing fluid valve. When the locomotive leaves the insulated track section 84, current is broken and the valve 81 reverses, due to spring pressure or gravity, and the fluid pressure may pass to pipe 75 to cut off the washing fluid and turn the pipe sections parallel to the track and out of operative position.

Having described preferred embodiments only of my invention what is desired to be secured by Letters Patent and is claimed as new is:

1. Apparatus for washing a locomotive on a track comprising, a pit on each side of said track in proximity thereto; a vertical pipe section rotatably mounted in each of said pits; means connecting said pipe sections for simultaneous rotation; means in one of said pits for imparting rotation to one of said pipe sections; a horizontal pipe section connected at one end thereof to the outer end of each of said vertical pipe sections; a second substantially long vertical pipe section connected at the lower end thereof to the opposite end of each of said horizontal pipe sections; spray nozzle carried by and in communication with said last vertical pipe sections; and means for admitting water and oil under pressure simultaneously with the rotation of said first vertical pipe sections.

2. An apparatus for washing locomotives or similar vehicles, comprising cleansing devices consisting solely of laterally spaced vertically extending oppositely disposed pipes arranged to permit the passage of a vehicle therebetween and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle including the top thereof, means to supply water to said pipes and nozzles, and means to continuously supply a quantity of oil to the water supply for said pipes, said oppositely disposed nozzles projecting sprays of water and oil toward each other in a zone between two vertical planes located relatively closely together, whereby the vehicle may be cleaned progressively by passing it through said zone.

3. An apparatus for washing locomotives or similar vehicles, comprising a cleansing device consisting solely of laterally spaced pipes arranged to permit the passage of a vehicle therebetween and a multiplicity of nozzles arranged at relatively spaced intervals along the length of each of said pipes and projecting laterally therefrom to project a spray upon the vehicle including

the top thereof; means to supply water to said pipes and nozzles, means to continuously supply a quantity of oil to the water supply for said pipes, and mechanism to simultaneously revolve said pipes so that the nozzles may be moved from an operative position in which the nozzles on one pipe extend toward the nozzles of the other pipe and vice versa to a position in which the nozzles extend at a substantial angle to their operative position, said oppositely disposed nozzles when in operative position, projecting sprays of water and oil toward each other in a zone between two vertical planes located relatively closely together whereby the vehicle may be cleaned progressively by passing it through said zone.

4. An apparatus for cleaning locomotives or similar vehicles, comprising cleansing devices consisting solely of laterally spaced vertically extending oppositely disposed pipes arranged to permit the passage of a vehicle therebetween and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle including the top thereof, means to supply water to said pipes and nozzles, means to continuously supply a quantity of oil to the water supply for said pipes, said oppositely disposed nozzles projecting sprays of water and oil toward each other in a zone between two vertical planes located relatively closely together, whereby the vehicle may be cleaned by passing it through said zone and means to collect the oil and water discharged from said nozzles, whereby the oil may be reclaimed.

5. An apparatus for washing locomotives or similar rail vehicles comprising cleansing devices, consisting solely of laterally spaced vertically extending, oppositely disposed pipes arranged to permit the passage of a vehicle therebetween and mounted for pivotal movement with respect to vertical axes disposed respectively a substantial distance laterally of said pipes in directions away from the tracks, a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle including the top thereof, means to supply water to said pipes and said nozzles, means to continuously supply a quantity of oil to the water supply for said pipes; said oppositely disposed nozzles projecting sprays of water and oil toward each other in a zone between two vertical planes located relatively close together, whereby the vehicle may be cleaned by passing it through said zone, and mechanism to bodily move said pipes about said axes from an operative to an inoperative position, whereby the spacing between said pipes in the latter position is substantially increased.

6. Apparatus for washing rail vehicles on a track comprising a vertical pipe section journaled at its lower end disposed at one side of said track; a substantially horizontal pipe section connected at its outer end to said vertical pipe section; antifriction means disposed adjacent the inner end of said horizontal pipe section; a long vertical pipe section provided with spray nozzles connected at its lower end to the other end of said substantially horizontal pipe section; braces extending between said horizontal and last mentioned vertical sections; a washing medium supply pipe communicating at one end thereof with the lower end of said first mentioned vertical pipe section; a duplicate arrangement of pipes on the opposite side of said track; the opposite ends of said washing medium supply pipes being connected into a connector; a water line and a steam line in communication with said connector; an oil supply pipe in communication with each of said washing medium supply pipes; means for effecting rotation of said first mentioned vertical pipe sections; and means for admitting water, steam and oil through said connector and said oil supply pipes into said washing medium supply pipes and thence into said last vertical pipe sections.

7. Apparatus for washing rail vehicles on a track comprising a vertical pipe section journaled at its lower end disposed at one side of said track; a substantially horizontal pipe section connected at its outer end to said vertical pipe section; a long vertical pipe section provided with spray nozzles connected at its lower end to the other end of said substantially horizontal pipe section; a washing medium supply pipe communicating at one end thereof with the lower end of said first mentioned vertical pipe section; a duplicate arrangement of pipes on the opposite side of said track; the opposite ends of said washing medium supply pipes being connected into a connector; a water line and a steam line in communication with said connector; an oil supply pipe in communication with each of said washing medium supply pipes; means for effecting rotation of said first mentioned vertical pipe sections; and means for admitting water, steam and oil through said connector and said oil supply pipes into said washing medium supply pipes and thence into said last vertical pipe sections.

8. An apparatus for washing locomotives or similar vehicles, comprising cleansing devices consisting solely of spraying means, said means comprising laterally spaced vertically extending oppositely disposed pipes arranged to permit the passage of a vehicle therebetween and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle, means to supply water to said pipes and nozzles, and means to continuously supply a quantity of oil to the water supply for said pipes, said spraying means projecting sprays of water and oil toward each other in a zone between two vertical planes located relatively closely together, whereby the vehicle may be cleaned progressively by passing it through said zone.

9. An apparatus for washing locomotives or similar vehicles, comprising cleansing devices consisting solely of spraying means, said means comprising laterally spaced vertically extending oppositely disposed pipes arranged to permit passage of a vehicle therebetween and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle, means to supply water and means to supply cleansing fluid to said pipes and nozzles said spraying means projecting sprays of water and cleansing fluid toward each other in a zone between two vertical planes located relatively closely together, and means dependent on movement of a vehicle between said oppositely disposed pipes to control said water supply means and said cleansing fluid supply means whereby the vehicle may be automatically cleaned progressively by passing it through said zone.

10. An apparatus for washing locomotives or similar vehicles comprising cleansing devices consisting solely of spraying means, said means comprising laterally spaced vertically extending oppositely disposed pipes arranged to permit the passage of a vehicle therebetween and a multi-

plicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle, means to supply water to said pipes and nozzles, and means to continuously supply a quantity of oil to the water supply for said pipes, said spraying means projecting sprays of water and oil toward each other in a zone between two vertical planes, located relatively closely together and means dependent on movement of a vehicle between said oppositely disposed pipes to control said water supply means and said oil supply means, whereby the vehicle may be automatically cleaned progressively by passing it through said zone.

11. An apparatus for washing locomotives or similar vehicles, comprising cleansing devices consisting solely of spraying means, said means comprising a vertically extending pipe arranged adjacent the path of the vehicle, and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of said pipe to project a spray upon the vehicle; means to supply water to said pipe and nozzles; and means to continuously supply a quantity of oil to the water supply for said pipe; said spraying means projecting sprays of water and oil in a zone between two vertical planes located relatively closely together, whereby a side of the vehicle may be cleaned progressively by passing it through said zone.

12. An apparatus for washing locomotives or similar vehicles comprising cleansing devices consisting solely of spraying means, said means comprising laterally spaced, vertically extending, oppositely disposed pipes, arranged to permit the passage of a vehicle therebetween and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle, means to supply water and a cleansing material simultaneously to said pipes and nozzles, said spraying means projecting sprays of water and cleansing material toward each other in a zone between two vertical planes located relatively closely together, whereby the vehicle may be cleaned progressively by passing it through said zone.

13. An apparatus for washing locomotives or similar vehicles, comprising cleansing devices consisting solely of spraying means, said means comprising laterally spaced vertically extending oppositely disposed pipes arranged to permit the passage of a vehicle therebetween, and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of each of said pipes to project a spray upon the vehicle, means to supply water to said pipes and nozzles, and means to continuously supply a quantity of cleansing fluid to the water supply for said pipes, said spraying means projecting sprays of water and cleansing fluid toward each other in a zone between two vertical planes located relatively closely together, whereby the vehicle may be cleaned progressively by passing it through said zone.

14. An apparatus for washing locomotives or similar vehicles, comprising cleansing devices consisting solely of spraying means, said means comprising a vertically extending pipe arranged adjacent the path of the vehicle and a multiplicity of discharge nozzles arranged at relatively closely spaced intervals along the length of the pipe to project a spray upon the vehicle, means to supply water to said pipe and nozzles, and means to continuously supply a quantity of cleansing fluid to the water supply for said pipe, said spraying means projecting sprays of water and cleansing fluid in a zone between two vertical planes located relatively closely together, whereby a side of the vehicle may be cleaned progressively by passing it through said zone.

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