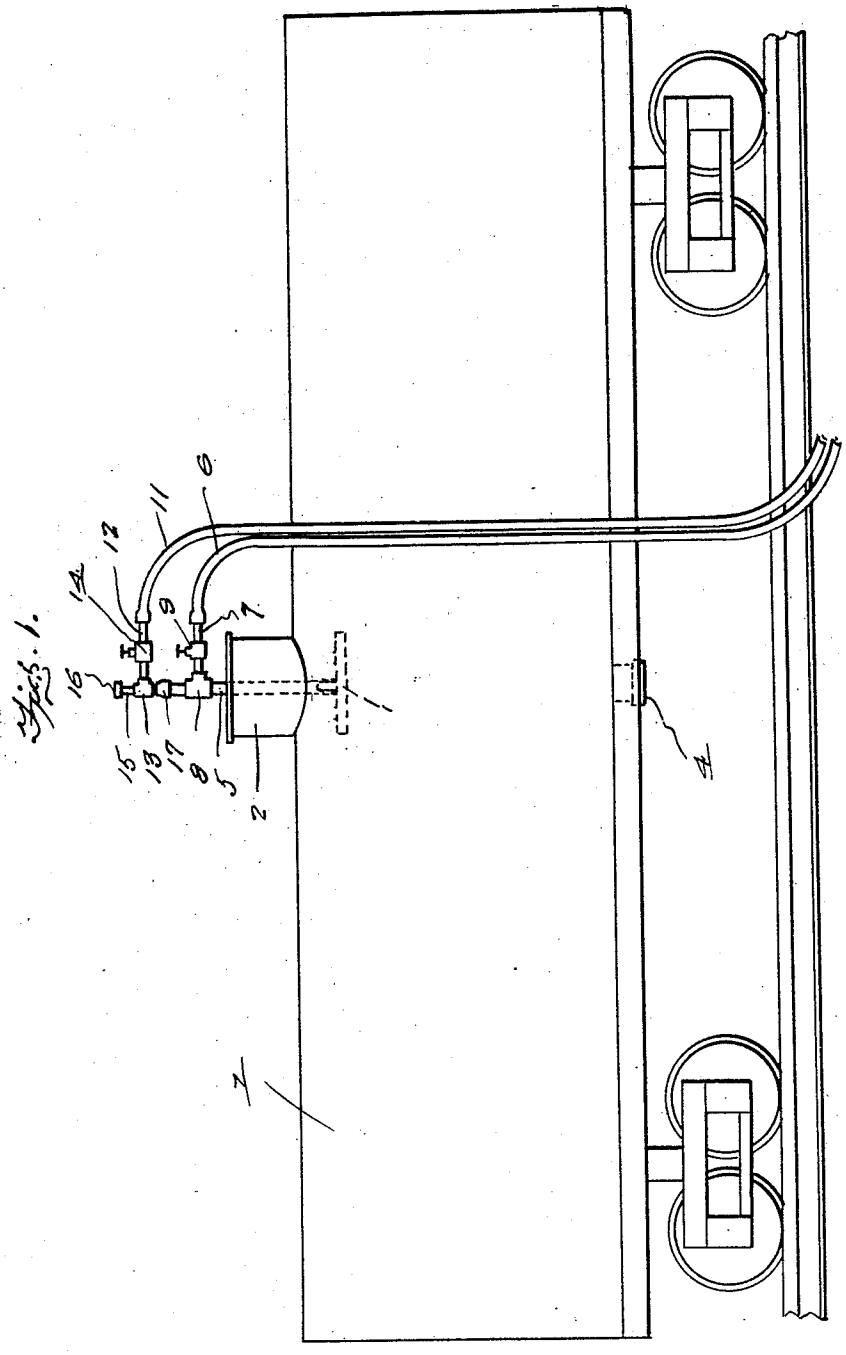
Aug. 4, 1931. M. E. BYERLEY 1,816,954

TANK CAR CLEANING APPARATUS

Filed May 20, 1930 2 Sheets-Sheet 1



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Fig. 3.

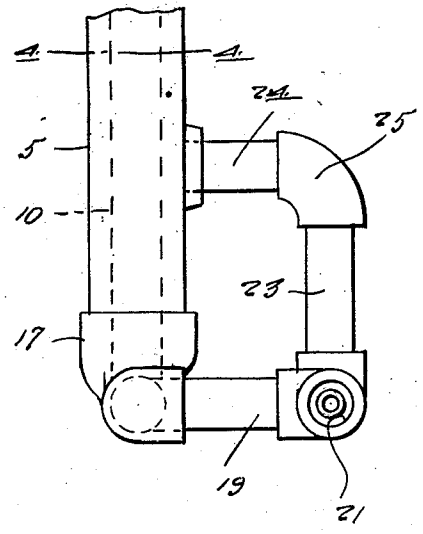


Fig. 2.

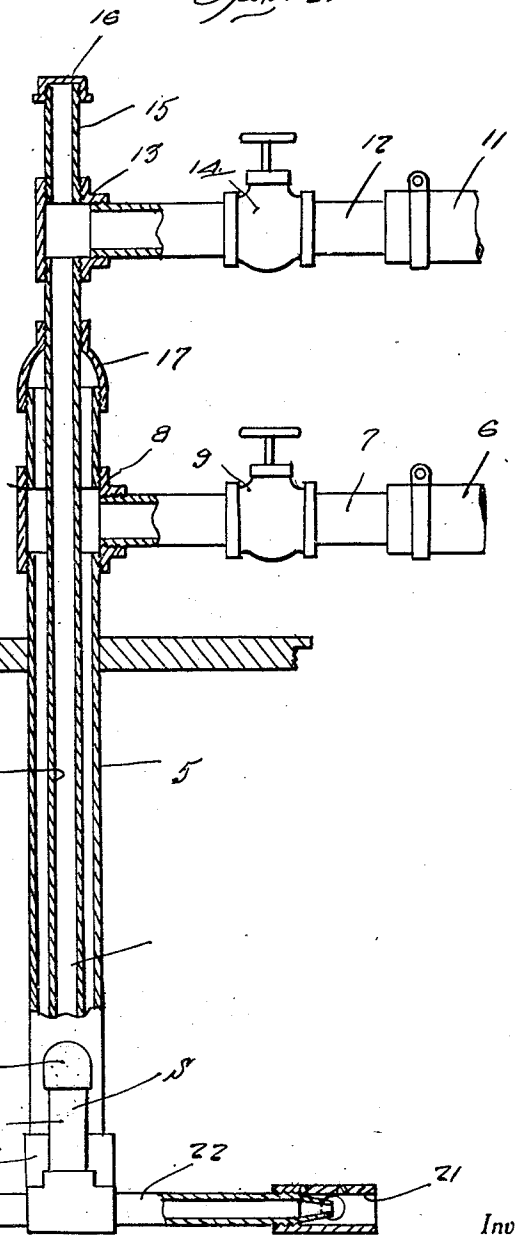
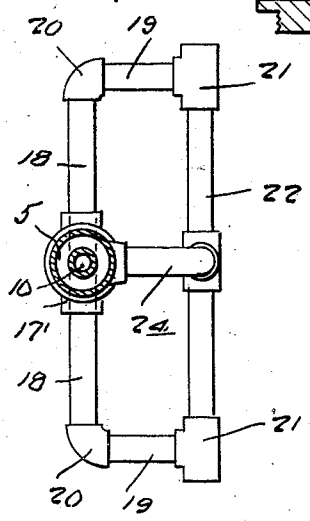


Fig. 4.



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UNITED STATES PATENT OFFICE

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TANK CAR CLEANING APPARATUS

Application filed May 20, 1930. Serial No. 457,420.

This invention relates to a tank car cleaning apparatus and has for its primary object to provide, in a manner as hereinafter set forth, an apparatus of this character embodying a novel construction and arrangement of parts for injecting hot water and steam into the tank car, the water being preheated by the steam while passing through the apparatus in a manner to materially raise the temperature of said water prior to its mixture with the steam and discharge into the car.

Other objects of the invention are to provide a tank car cleaning apparatus of the character described which will be comparatively simple in construction, strong, durable, efficient and reliable in its use and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention may become apparent from a study of the following specification, taken in connection with the accompanying drawings, wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in side elevation showing a device constructed in accordance with this invention mounted in operative position on a tank car,

Figure 2 is a view partly in front elevation and partly in section of the cleaning apparatus,

Figure 3 is a fragmentary view in side elevation of the lower portion of the device,

Figure 4 is a horizontal sectional view taken substantially on the line 4—4 of Figure 3 looking downwardly in the direction indicated by the arrows.

Referring to the drawings in detail, it will be seen that reference numeral 1 designates the body of a tank car having the usual inlet 2 on its top which is closed by the closure plate 3. The reference numeral 4 designates a drain outlet in the bottom of the tank car. It should be here mentioned that the closure plate 3 is in the nature of an auxiliary device to be utilized with the cleaning apparatus upon which same is mounted and displaces the usual closure for the inlet when the cleaning apparatus is mounted in position.

Mounted on the closure plate 3 and extending therethrough is a steam conducting pipe 5 to which steam is supplied from the hose 6 through the medium of the pipe section 7 which is connected to said steam pipe 5 through the medium of the coupling 8. The pipe section 7 has interposed therein a steam control valve 9 for manual operation.

A water conducting pipe 10 extends longitudinally through the steam pipe 5 in spaced relation thereto and projects therefrom at its opposite ends. Water is supplied to the pipe 10 from the hose 11 through the medium of the pipe section 12 which is connected thereto by the coupling 13 and which has interposed therein a water control valve 14. An extension 15 extends upwardly from the coupling 13 and has its upper end closed by a removable cap 16. The upper end of the steam pipe 5 is closed by a collar 17 having one end engaged with the water pipe 10 and its opposite ends threaded on said steam pipe. The lower end of the steam pipe 5 is closed by the member 17′ which is threaded thereon.

The member 17′ is in the form of a coupling having communication with the water pipe 10 and from the opposite sides of which project the pipes 18 to which are connected the pipes 19 by the elbows 20. The pipes 19 discharge into the T-couplings 21 mounted on the opposite end portions of a steam pipe 22 having communication with the steam pipe 5 in a manner to receive steam therefrom through the medium of a riser 23 and a pipe section 24 connected thereto by the elbow 25 and having communication with said steam pipe 5. The outer ends of the T-couplings 21 are open and said T-couplings constitute mixing chambers for the water and steam.

In use, steam passes downwardly through the pipe 5 into the pipe section 24 and then downwardly through the riser 23 from which said steam passes in opposite directions through the pipe 22. The pipe 10 is, of course, heated by the contact of the steam therewith when the steam is passing through

the pipe 5. Water from the hose 11 passes downwardly through the pipe 10 and in so doing is heated. The water passes through the pipes 18 from the pipe 10 and then through the pipes 19 into the nozzles 21 where it is mixed with the steam and discharged into the car body 1. As will be apparent, the proportions of the water and steam may be expeditiously regulated through the medium of the valves 9 and 14.

It will be noted that the pipe 22 terminates, at its opposite ends, in reduced jet forming nozzles extending into the members 21 in spaced relation thereto and by reason of this arrangement the discharging steam will create a suction in the water pipes to draw water therethrough from the source of supply. It will be noted that the ends of the jet forming nozzles of the pipe 22 are disposed in transverse alignment with the water inlet openings. The water enters the mixing chambers flowing in a direction at right angles to the direction of flow of the steam as a result of which the streams will collide and be thoroughly broken up and mixed with each other.

It is believed that the many advantages of a tank car cleaning apparatus constructed in accordance with this invention will be readily understood, and although the preferred embodiment of the invention as illustrated and described, it is to be understood that changes in the details of construction may be had which will fall within the scope of the invention.

Having thus described my invention, what I claim as new is:

A tank car cleaning apparatus of the character described comprising a steam conducting pipe, supporting means for the steam conducting pipe, a water conducting pipe extending longitudinally through the steam conducting pipe, a steam discharge pipe having communication, at an intermediate point, with the steam conducting pipe for receiving steam therefrom, nozzles on the ends of the steam discharge pipe, mixing chambers on the free end portions of the steam discharge pipe extending longitudinally over and beyond the nozzles, and conduits connected with the water conducting pipe and with the mixing chamber in a manner to discharge water thereinto in a direction at right angles to the direction of flow of the steam and to impinge the water against the outlet ends of the nozzles.

In testimony whereof I affix my signature.

MARSHAL E. BYERLEY.

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