

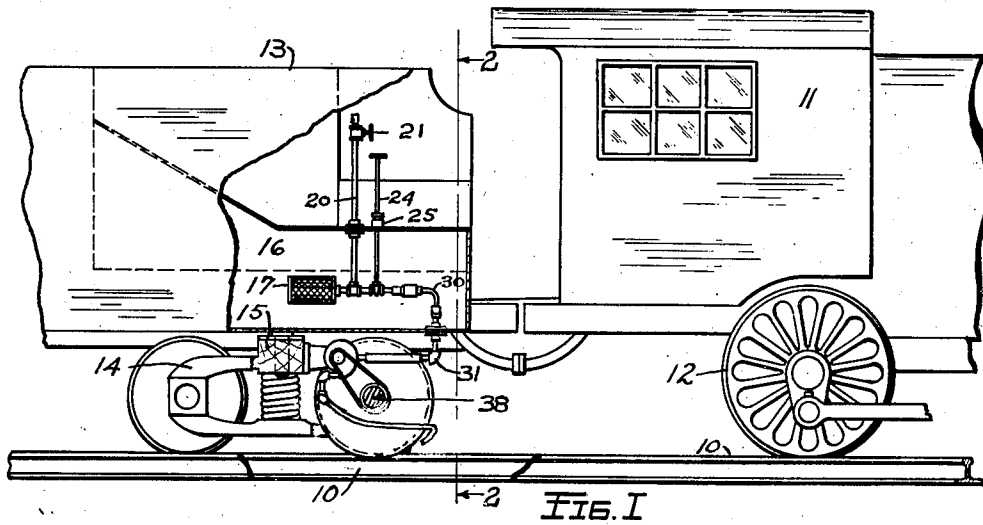
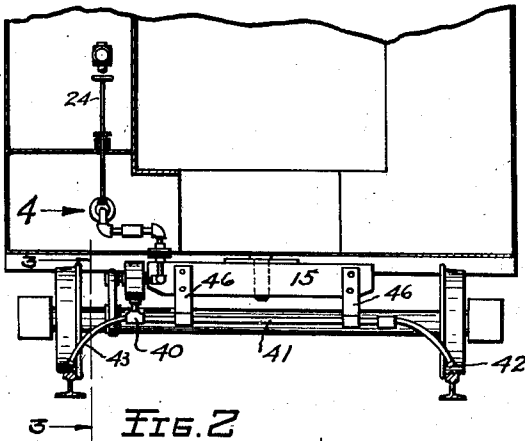
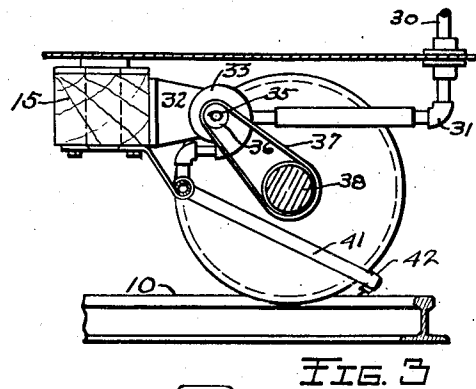
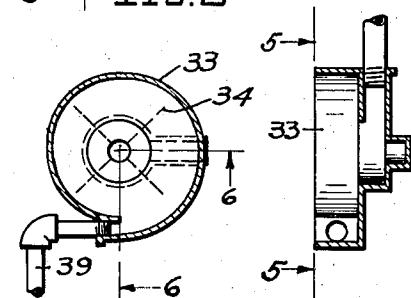
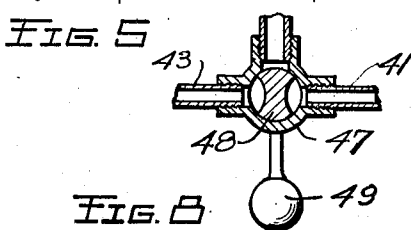
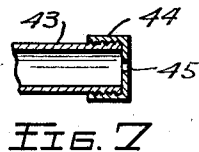
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G. A. ALLEN

2,184,969

RAIL WETTING DEVICE FOR RAILROADS

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INVENTOR.
GEORGE A. ALLEN

BY *Martin E. Anderson*
ATTORNEY.

UNITED STATES PATENT OFFICE

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RAIL WETTING DEVICE FOR RAILROADS

George A. Allen, Denver, Colo.

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5 Claims. (Cl. 299—31)

This invention relates to improvements in means for lubricating railway rails for the purpose of decreasing wear of wheels and rails and reducing frictional resistance.

It is well known that a big item of expense in railroad operation is due to wear on wheels and rails during operation and to the increased fuel bill caused thereby.

It has long been observed that railway trains run with less noise and offer less resistance to movement during and after rains and this has been ascribed to the lubricating effect of the water film. It has also been observed that the frictional resistance between the rails and locomotive drivers is decreased to such an extent that it is sometimes necessary to reduce the load by disconnecting some of the cars. All of this shows quite conclusively that a water film has some lubricating value and consequently reduces friction and wear.

It is the object of this invention to produce a mechanism that will make it practical to wet the rails as the train moves over them and to apply the water at a rate corresponding to the rate at which the train travels so as to effect uniform lubrication or wetting at all speeds.

The several advantages that will accrue from the application of water to the rails during operation of trains, include the following: decrease wear of wheels and rails, decreased tendency of wheels to climb track, reduced noise during operation, reduced brake shoe wear and reduced power consumption.

In order to more clearly describe the invention, reference will now be had to the accompanying drawing in which a device has been illustrated by means of which the invention can be practiced and in which:

Figure 1 is a side elevational view with parts broken away showing a locomotive tender equipped with my invention;

Figure 2 is a view taken on plane 2—2, Figure 1, parts being broken away to better disclose the construction;

Figure 3 is a section taken on line 3—3; Figure 2 showing the parts to two times the scale used in Figure 1;

Figure 4 is a side elevation of the parts positioned in the water tank, taken looking in the direction of arrow 4 in Figure 2;

Figure 5 is a section taken on line 5—5, Figure 6 and shows in a general way the construction of the pump;

Figure 6 is a section taken on line 6—6, Figure 5;

Figure 7 is a section through the ends of the water delivery pipes showing the removable orifice cap in place thereon; and

Figure 8 is a section through a two-way valve, operated by centrifugal force when the car or train rounds a curve.

In the drawing reference numeral 10 designates the rails of a railway and 11 the cab of a locomotive. One of the drive wheels of the locomotive has been designated by reference numeral 12. The tender has been designated in its entirety by reference numeral 13. As this is merely for the purpose of illustration, the representation of the engine and tender has been shown in a more or less diagrammatic manner. The supporting frame of the tender, which has been designated by reference numeral 14, has been broken away to show the end of the bolster 15. The front wheel of the truck rests on the rail farthest away from the observer and the rear wheel on the rail nearest the observer, a section of the latter rail having been broken away as shown. All locomotive tenders used in connection with steam locomotives have a compartment for fuel which has been indicated by broken lines and this is surrounded by a water compartment which has been designated by reference numeral 16. The water for wetting the rails can be most conveniently taken from the water compartment 16, but may be supplied from a separate reservoir if desired. Positioned in the compartment 16 near to the bottom thereof, is a filter 17 that is attached to a short length of pipe 18 which in turn is connected with a T 19 from which a pipe 20 extends upwardly through the upper wall of the water compartment and terminates in a valve 21. A coupling 22 extends from the T 19 to a globe or gate valve 23 and this valve has a long valve stem 24 that also projects through the top of the water compartment in the manner shown in Figure 1. A stuffing box 25 serves to make a watertight connection between the wall and the valve stem. When valve 23 is closed and valve 21 opened, it is possible to flow air from the compressed air supply downwardly through this pipe for the purpose of cleaning the filter. A coupling 26 connects the valve 23 with a relief valve 27. This relief valve has a poppet valve 28 that is held in closed position by a weak spring 29. The function of this relief valve is to prevent water from flowing down to the hydrostatic head in the tender and it can have a spring that resists the hydrostatic head considerably greater than that which can normally be produced by the water supply in the compartment 16. The

pipe 30 extends from the relief valve through the bottom of the water compartment and terminates in an L 31.

Attached to a bracket 32 that is secured to the bolster 15 is a pump 33 which, in the apparatus illustrated, is a centrifugal pump having an impeller 34. The impeller shaft 35 is provided with a V pulley 36 and this is connected by means of a V belt 37 with the front axle 38 of the tender truck. The pump is so arranged that when the tender travels in a forward direction, it will set up a centrifugal force tending to deliver water through the exhaust port and into pipe 39. The action of this pump will produce a suction which added to the hydrostatic head in the tender will be sufficient to cause water to flow past the relief valve. Pipe 39 is provided with a T 40 from which pipe 41 extends transversely and terminates in a nozzle 42, positioned in front of one of the tender wheels and directly above the rail. Another and similar pipe 43 extends to and terminates in front of the other wheel. The ends of pipes 41 and 43 are provided with removable caps 44 having orifices 45 of proper size. The orifices should be between one-sixteenth and one-eighth of an inch in diameter, but may be varied to suit other conditions. Pipe 41 is supported from the bolster by means of brackets 46 that hold it rigidly in position. When the train is operating and valve 23 is open, a continuous stream of water will be delivered to the upper surface of each rail directly in front of the front tender wheel.

In some cases it may be sufficient if water is flowed onto rails at curves only and this is true more especially with tram cars. In such cases it is possible to replace the T 40 with a two-way valve 47 whose rotatable valve member 48 is controlled by a weight 49 that projects downwardly some distance. When a car or train is equipped with a valve like that shown in Figure 8, the valve will remain closed when the train travels in a straight line, but will open when the train goes around a curve and deliver water to the outer rail so as to lubricate the surface of the rail that contacts the flange. The centrifugal force produced by the moving train will, of course, move the wheels against the outer rail of the track and this makes it possible to dispense with the lubrication of the inside rail on curves. For street cars and similar vehicles that move slowly, the use of a pump may not be necessary and when the pump can be dispensed with, a valve like that shown in Figure 8 will be sufficient to control the flow of water.

At this point it may be explained that although it is believed that the most logical point of applying the water to the rail is directly in front of the foremost tender wheel, it is, of course, permissible to wet the rails at some point farther back, but no advantage is seen for such a variation.

It will be observed that the pump is driven at a speed proportion to the speed of the train and therefore sets up a pressure that varies directly with the train's speed and this again produces a flow of water that is directly proportional to the rate at which the train travels. Although a centrifugal pump has been indicated, it is, of course, possible to replace this with a gear pump or other positive acting pump, in which case the rate of water delivered will always be exactly proportional to the speed of the train.

Having described the invention what is claimed as new is:

1. In combination with a railway train having a tractor and cars trailed thereby, means for wetting the rail surfaces to the rear of the tractor, said means comprising a reservoir carried by one of the units of the train, a centrifugal pump driven from the axle of a train unit, a conduit extending from the reservoir to the suction port of the pump, a spring pressed relief valve in the conduit adjusted to resist the hydrostatic head of the water and conduits extending from the delivery port of the pump to points above the rails whereby when the train travels, water will be flowed onto the rails at a rate proportional to the speed of the train.

2. In a railway train having an engine provided with traction wheels, a tender attached to the engine, the tender having a reservoir for water, means for flowing water onto the rails, to the rear of the traction wheels, as the train travels, said means comprising a centrifugal pump driven from an axle of the tender, a conduit connecting the pump intake port with the interior of the reservoir, conduits extending from the pump outlet port to points above the rail surfaces whereby water will be flowed onto the rails at a rate proportionate to the speed of the train, and means for closing the conduit from the reservoir to the pump when the latter is stationary.

3. In a railway train having an engine provided with traction wheels, a tender attached to the engine, the tender having a reservoir for water, means for flowing water onto the rails, to the rear of the traction wheels, as the train travels, said means comprising a centrifugal pump driven from an axle of the tender, a conduit connecting the pump intake port with the interior of the reservoir, conduits extending from the pump outlet port to points above the rail surfaces whereby water will be flowed onto the rails at a rate proportionate to the speed of the train and a spring pressed relief valve in the conduit between the pump and the reservoir, adjusted to prevent flow of water due to the hydrostatic pressure alone, but permitting water to flow when the pump operates whereby water will be flowed onto the rails only during the time the train travels.

4. In a railway train having an engine provided with traction wheels, a tender attached to the engine, the tender having a reservoir for water, means for flowing water onto the rails, to the rear of the traction wheels, as the train travels, said means comprising a centrifugal pump driven from an axle of the tender, a conduit connecting the pump intake port with the interior of the reservoir, conduits extending from the pump outlet port to points above the rail surfaces whereby water will be flowed onto the rails at a rate proportionate to the speeds of the train, a spring pressed relief valve in the conduit between the pump and the reservoir, adjusted to prevent flow of water due to the hydrostatic pressure alone, but permitting water to flow when the pump operates whereby water will be flowed onto the rails only during the time the train travels, and a manually controlled valve in the conduit between the reservoir and the relief valve.

5. In a railway train having an engine provided with traction wheels, a tender attached to the engine, the tender having a reservoir for water, means for flowing water onto the rails, to the rear of the traction wheels, as the train travels, said means comprising a centrifugal pump driven from an axle of the tender, a conduit connecting the pump intake port with the interior of the

reservoir, conduits extending from the pump outlet port to points above the rail surfaces whereby water will be flowed onto the rails at a rate proportionate to the speed of the train, a spring
5 pressed relief valve in the conduit between the pump and the reservoir, adjusted to prevent flow of water due to the hydrostatic pressure alone, but permitting water to flow when the pump operates whereby water will be flowed onto the

rails only during the time the train travels, a manually controlled valve in the conduit between the reservoir and the relief valve, and means for introducing air under pressure into that portion
of the conduit between the manually controlled
valve and its communication with the reservoir
5 for cleaning purposes.

GEORGE A. ALLEN.