July 27, 1937. T. H. SCHOEPF ET AL 2,088,487

RAILWAY CAR

Filed Feb. 15, 1935

FIG. 1.

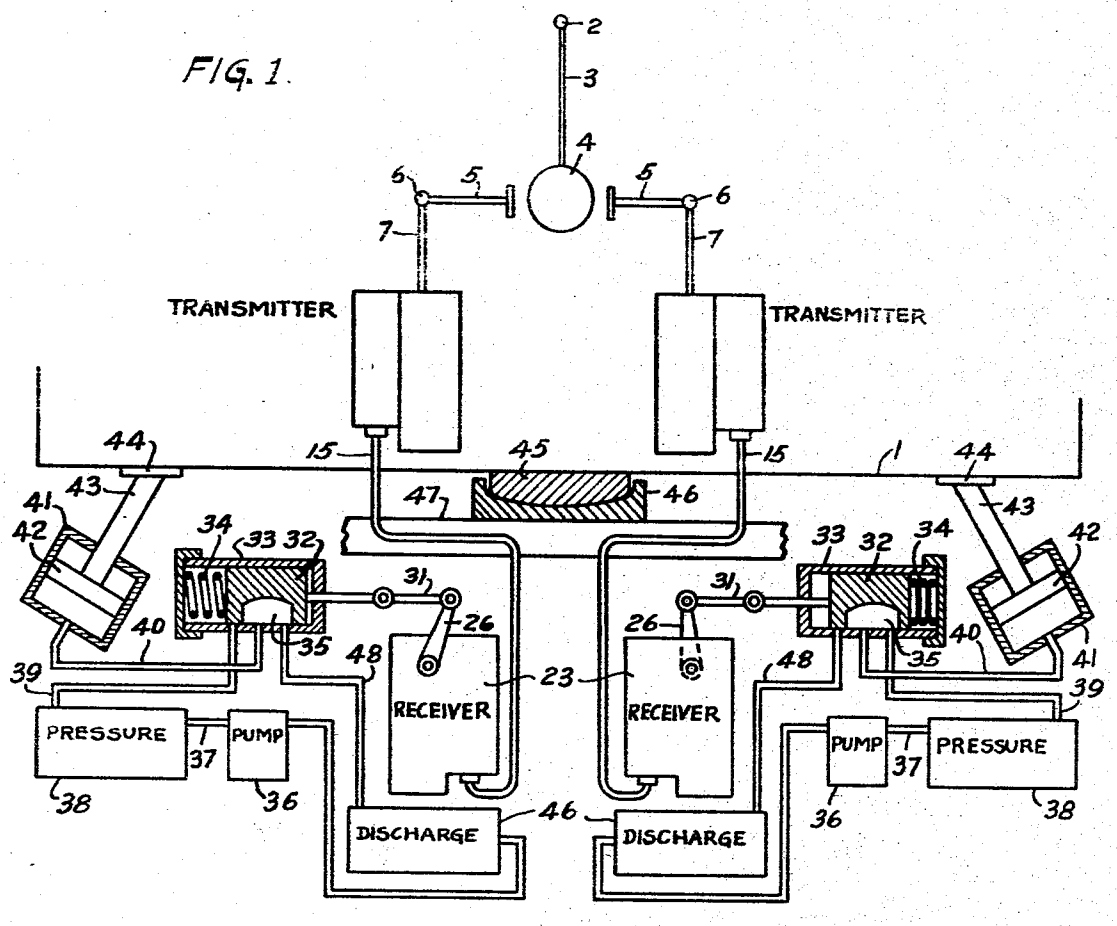


FIG. 2.

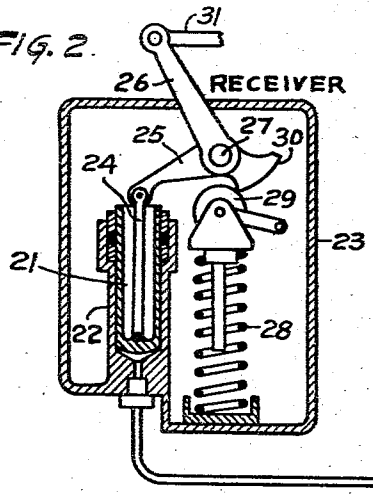
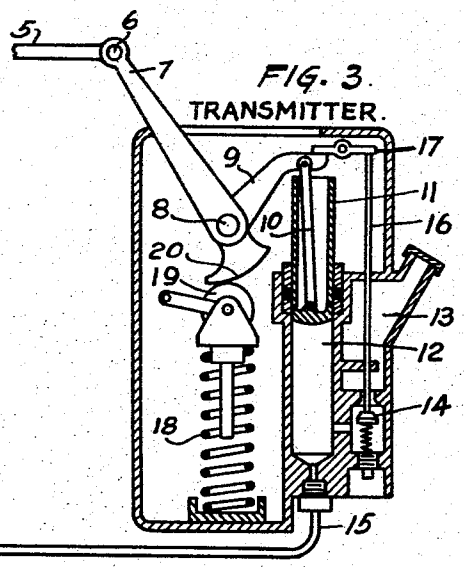


FIG. 3.



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RAILWAY CAR

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9 Claims. (Cl. 105—210)

Our invention relates to articulated cars, and in particular, to a means and method of resisting rocking movements of the cars in order to maintain them on a substantially horizontal plane.

Due to the fact that the cars are tilted by super-elevated rails on curves and are tilted due to compound curves, it is necessary to provide some means of restraining the oscillations and tilting of the cars, because in articulated cars the car bodies are pivotally mounted on semi-circular trunnions in semi-circular center plates.

It is the object of this invention to provide a remotely-controlled hydraulic control system for resisting the movements of the car bodies by applying a resisting force to that side of the car body adjacent its side bearing which is tending to descend.

Referring to the drawing:

Figure 1 is a diagrammatic view of the control apparatus applied to one end of an articulated car.

Figure 2 is a section through one of the controlled units.

Figure 3 is a section through one of the controlling units.

We desire to employ an hydraulic control system in which the actuating mechanism is substantially a solid column of fluid of small diameter. This column permits of a thrust being applied at a remote point around the corners and other obstructions, with the minimum interference.

Referring to the drawing in detail, 1 is a car body on which is mounted an actuating pendulum pivoted at 2, having a pendulum shaft 3 and a weight 4. This weight is adapted to engage the thrust arm 5, which is pivoted at 6 to the lever 7. The lever 7 is one arm of a bellcrank pivoted at 8, and having an arm 9. This arm is connected to a piston rod 10, operating a piston 11 in a cylinder 12.

The hydraulic fluid supply from the chamber 13, exit from which is controlled by the valve 14, is thus compressed and discharged through the pipe line 15. The valve 14 is controlled by the valve stem 16, which in turn, is actuated through the lever 17 by the arm 9. The spring 18, operating the roller 19, which engages with the bell crank through the cam surface 20, serves to regulate the movement of the piston 11.

The result of the pressure in the line 15 is to actuate the piston 21 in the cylinder 22 of the remotely-controlled unit 23. The piston 21 has a piston rod 24, pivoted to the bellcrank arm 25. The bellcrank arm 25 is connected to the arm 26. The bellcrank is pivoted at 27. A second spring 28 with a roller 29 engaging the cam 30, regulates the movement of this arm.

The result is that the arm 26, which is connected to the piston rod 31, is moved with the piston rod. This, in turn, operates the valve 32 in the valve casing 33 against the spring 34. The valve 32 is chambered as at 35.

The pump 36 supplies fluid under pressure through the line 37 to the pressure chamber 38, which in turn, supplies fluid through the line 39 to the chambered portion 35 of the valve 32, whence the fluid passes through the line 40 into the cylinder 41, beneath the side bearing piston 42, with the result that the piston rod 43 engages the side bearing 44, and resists the downward movement of the body 1. The body 1 is supported upon a trunnion 45 and center plate 46, mounted on the usual truck bolster 47.

When the pressure is relieved in the pressure line 15 the spring 34 moves the valve 32 so that the fluid under pressure below the piston 42 in the cylinder 41 can return through the pipe 40 under pressure of the piston 42, and thence pass into the line 48 and into the discharge tank 46, whence it is pumped by the pump 36 into the pressure tank 38. Thus the pressure of the discharge is utilized to maintain the pressure in the pressure tank, and the pump is operating upon fluid already under pressure so as to reduce the amount of work the pump has to perform.

We find it desirable to mount the transmitter shown in Figure 3 on the body, where it can be actuated by the pendulum. We further find it desirable to locate the receiver and valve mechanism on the truck closely adjacent the side bearing. The pump, pressure and discharge tanks are preferably mounted upon the car body, but can be mounted upon the truck.

As the apparatus on both sides is alike a description of one side is sufficient for both sides. When the car tilts in one direction that side will have the pressure applied to resist the tilting movement elsewhere.

It will be understood that we desire to comprehend within our invention such modifications as come within the scope of the claims and the invention.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In combination, a tiltable car body, side bearing means therefor, fluid pressure means for resisting the movement of the body when applied to the side bearing means, a valve for controlling

the application of the fluid pressure means to the side bearing means, a remotely actuated hydraulic controller connected to said valve means comprising a pressure line, means to create pressure therein and means to actuate said valve according to the pressure created in said line; and means on the car body for actuating said pressure-controlling means.

2. In combination, a tiltable body, hydraulically-actuated side bearing means, a pendulum on said body, an hydraulic transmission line, means actuated by said pendulum for generating hydraulic pressure in an hydraulic transmission line, means connected thereto for movement by the hydraulic pressure so transmitted, and a valve connected thereto for controlling the application of hydraulic pressure to said side bearing means.

3. In combination, a tiltable body, hydraulically-actuated side bearing means, a pendulum on said body, means actuated by said pendulum for generating hydraulic pressure in an hydraulic transmission line, an hydraulic transmission line, means connected to said hydraulic transmission line for movement by the hydraulic pressure so transmitted, a valve connected to said hydraulic transmission line for controlling the application of hydraulic pressure to said side bearing means, and means associated with said valve for restoring it to its initial position upon the reduction of pressure within said hydraulic pressure transmission line.

4. In combination, a car body, means on either side of the car body for resisting the rocking movement thereof, a pendulum-operating device and an hydraulic system operated thereby for resisting the downward movement of said body, said system comprising an hydraulic transmitter, an hydraulic receiver, a valve actuated in one direction by said receiver, means for returning said valve to its initial position, a source of fluid pressure controlled by said valve, and means to receive the fluid after having been applied, all as directed by said valve.

5. In combination, a car body, hydraulically-actuated means on either side thereof for resisting the rocking of said body, a pendulum, an hydraulic transmitting mechanism comprising a transmitter, a conduit and a receiver actuated by said pendulum and associated with the respective sides of said body; a valve actuated in one direction by said receiver, yielding means for moving the valve in the other direction, a pump, a pressure tank connected to said valve and supplied by said pump, a discharge tank connected to said valve and connected to said pump, and means connecting said hydraulic-resisting means to said valve, whereby when the transmitter is actuated by the pendulum the transmitter will actuate the receiver and the receiver will move the valve for the application of pressure from the pump and pressure tank to the hydraulic-resisting means and upon the return of the receiver and transmitter to normal position by the yielding means applied to the valve, the hydraulic pressure from the pressure-resisting means will return through the valve to the discharge tank.

6. In combination, a car body, hydraulically-actuated side bearing means, means operable by the tilt of the body for selectively operating pressure-applying means on either side of the body for supplying pressure to the side bearing means to resist the tilt of the body, said means comprising a transmitter, a transmission line, a receiver and a valve actuated thereby, yielding means for moving said valve, transmitter and receiver back into the initial position, and a system of piping interconnecting a pump, a pressure tank, a discharge tank and said side bearing through said valve, whereby when the valve is actuated by the transmitter and receiver pressure is applied to the side bearing means and when the valve is actuated by the yielding means hydraulic pressure is delivered from the side bearing means to the discharge tank.

7. In combination, a tiltable car body, yielding means for resisting the tilt thereof, a control for applying said yielding means comprising a pendulum, a transmitting piston operable in a transmitting cylinder operated by said pendulum, an hydraulic transmission line, a receiving cylinder and receiving piston, and means connecting said receiving piston to a control valve for controlling the application of hydraulic pressure to resist the tilting of the car body.

8. In combination, a tiltable car body, pressure means on either side thereof for resisting the tilting of the body, control means for controlling the application of pressure to the respective sides of the body, said control means comprising a pendulum, a transmitter consisting of a piston and cylinder, an hydraulic communication line connecting said cylinder to a receiver cylinder, a receiver cylinder and piston, yielding means in said transmitter and receiver for positioning said pistons, means controlled by said receiver in one direction for applying pressure, and yielding means for returning said last-named means to its initial position.

9. In combination, a tiltable car body, pressure means on either side thereof for resisting the tilting of the body, control means for controlling the application of pressure to the respective sides of the body, said control means comprising a pendulum, a transmitter consisting of a piston and cylinder, an hydraulic communication line connecting said cylinder to a receiver cylinder, a receiver cylinder and piston, yielding means in said transmitter and receiver for positioning said pistons, means controlled by said receiver in one direction for applying pressure, yielding means for returning said means to its initial position, and means associated with said transmitter for regulating the admission of hydraulic transmitting fluid to the transmission line.

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