April 30, 1929. A. C. SCHMOHL ET AL 1,711,211

FLUID PRESSURE OPERATED RAILWAY DUMP CAR

Filed Nov. 23, 1927 4 Sheets-Sheet 1

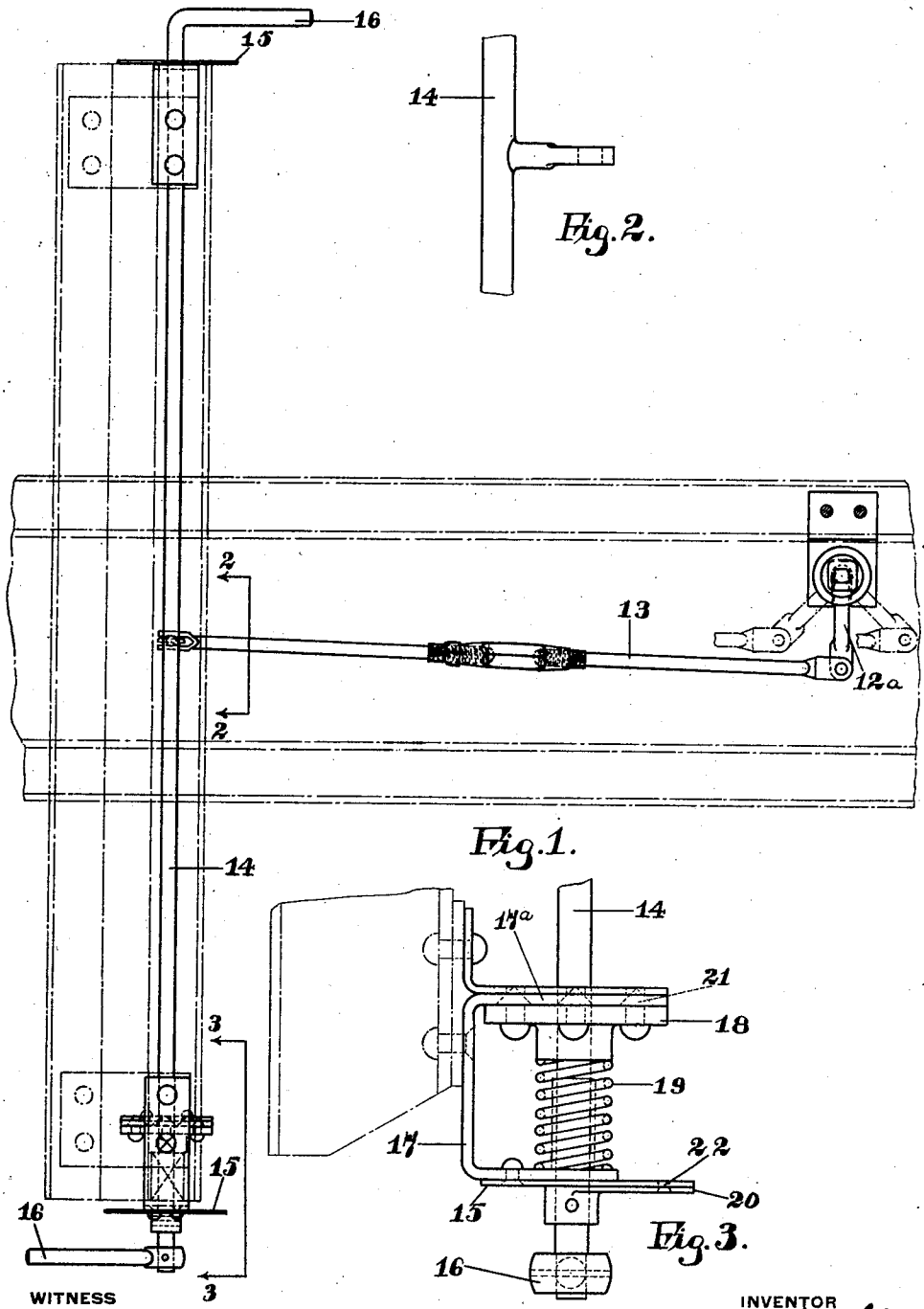


Fig. 2.

Fig. 1.

Fig. 3.

WITNESS

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FLUID PRESSURE OPERATED RAILWAY DUMP CAR

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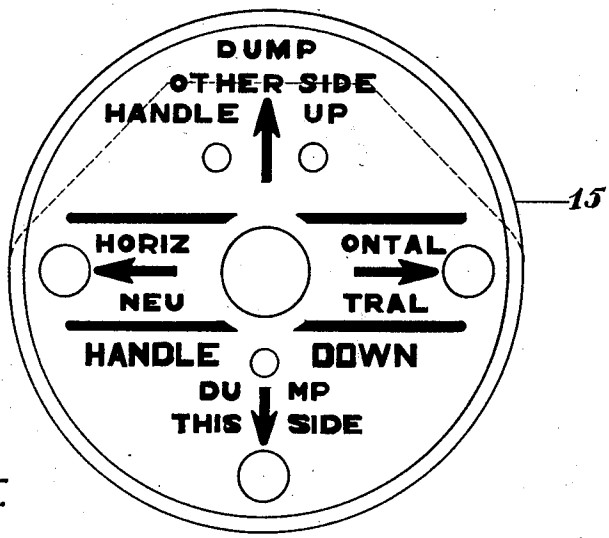


Fig. 5.

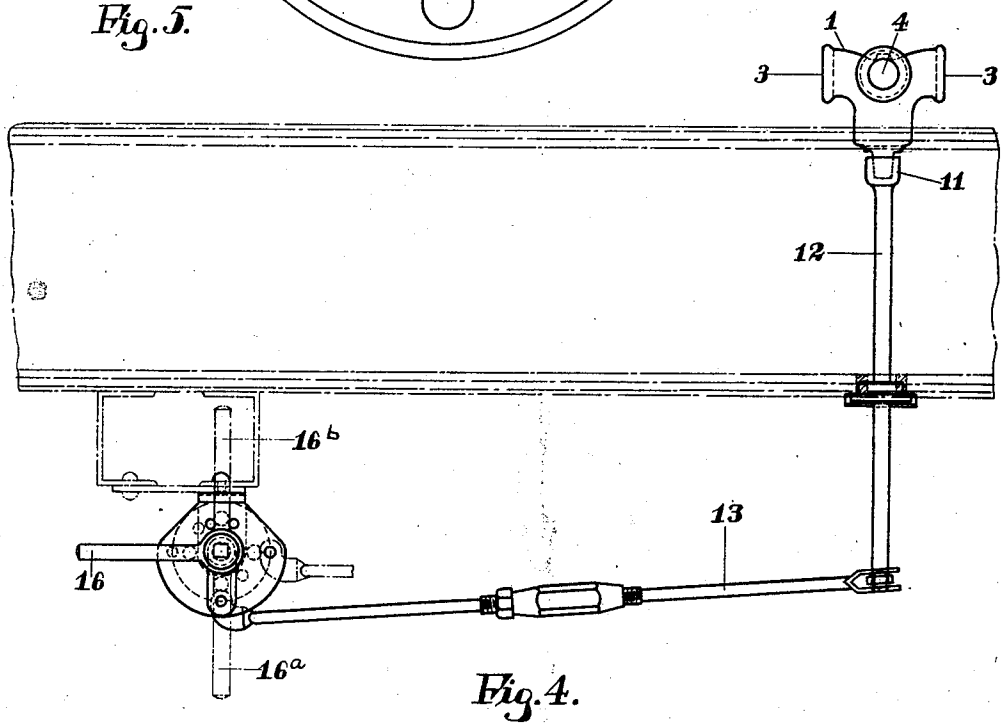


Fig. 4.

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FLUID PRESSURE OPERATED RAILWAY DUMP CAR

Filed Nov. 23, 1927 4 Sheets-Sheet 3

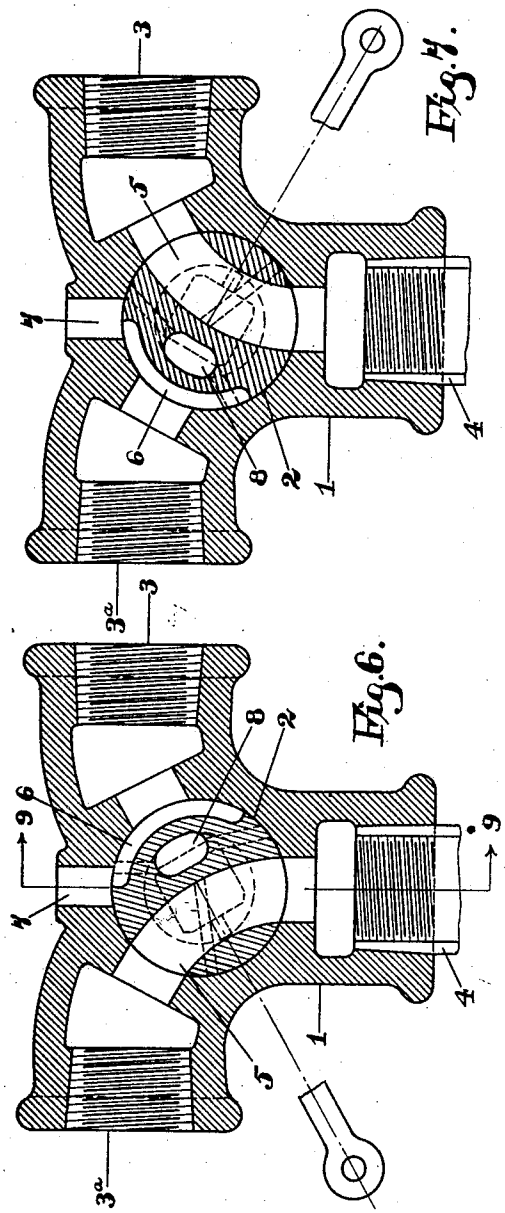


Fig. 4.

Fig. 6.

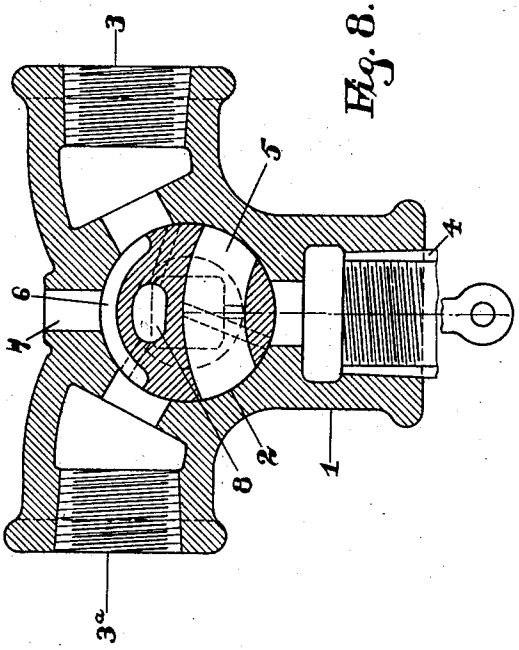


Fig. 8.

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FLUID PRESSURE OPERATED RAILWAY DUMP CAR

Filed Nov. 23, 1927 4 Sheets-Sheet 4

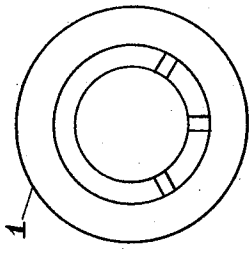


Fig.11.

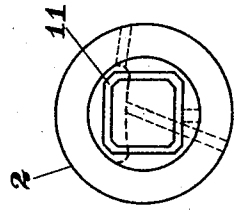


Fig.14.

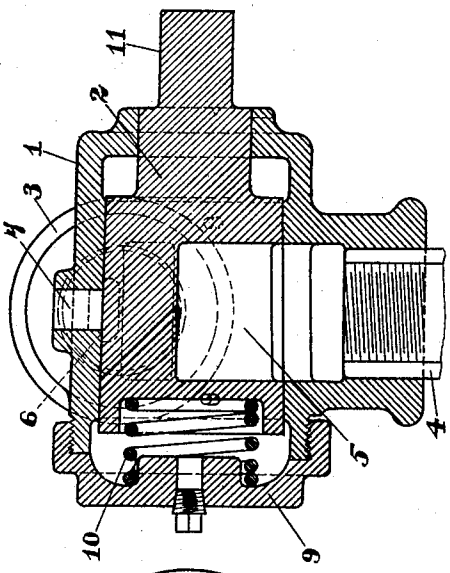


Fig.9.

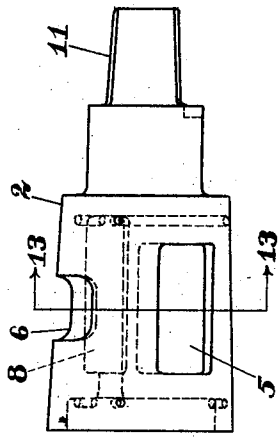


Fig.12.

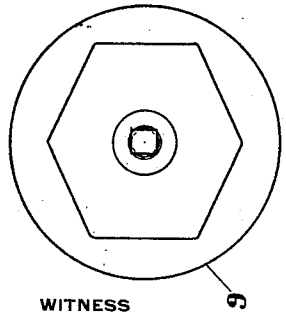


Fig.10

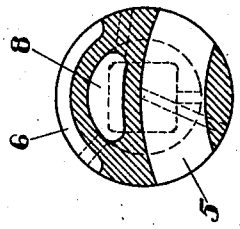


Fig.13

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Patented Apr. 30, 1929. 1,711,211

UNITED STATES PATENT OFFICE.

ALFRED C. SCHMOHL, OF BEAVER FALLS, AND JOHN P. ANDERSON, OF KOPPEL, PENNSYLVANIA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO PRESSED STEEL CAR COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

FLUID-PRESSURE-OPERATED RAILWAY DUMP CAR.

Application filed November 23, 1927. Serial No. 235,200.

An object of the invention is to provide a fluid pressure operated dump car with a valve for selectively supplying pressure to operate the body tilting cylinders and an indicating device in conjunction with the valve operating mechanism to indicate to the operator the side towards which the car will dump.

Another object of the invention is to provide a valve to control the selectively supplying of pressure to the desired body tilting cylinder that will also exhaust pressure from the inactive cylinder and allow its piston to descend freely and prevent injury to the cylinder or car parts while the piston of the other cylinder is rising.

Another object of the invention is to provide exhaust ports in the valve to permit any seepage of pressure to escape to the atmosphere when the valve is closed and so prevent accidental dumping of the car.

Another object of the invention is to provide a valve operating mechanism that will not only indicate the direction towards which the car is dumping, but will provide means for rendering the car inactive when a train of cars is being dumped as a unit, and to provide means for securing such indicating mechanism in place against accidental displacement.

The subject matter of this invention is to be used with a dump car having pressure operated body tilting cylinders, a pressure reservoir and a pressure supply line similar to that shown in our application filed January 6, 1928, Serial No. 244,877.

Referring to the drawings, Fig. 1 is a plan view of the valve operating and indicating mechanism; Fig. 2 is a view taken along the lines 2—2 of Fig. 1 showing the connection between the indicating mechanism and valve operating mechanism; Fig. 3 is a view along the lines 3—3 of Fig. 1; Fig. 4 is a side view of the valve operating mechanism and its application to the valve; Fig. 5 is an enlarged view of the indicating plate and shows the marking thereon; Figs. 6, 7 and 8 are sections taken through the valve showing the positions of the valve plug when the cylinders are being actuated and also when the valve is closed; Fig. 9 is a section through the valve taken along the lines 9—9 of Fig. 6; Figs. 10 and 11 are end views of the Fig. 9 showing the exterior of the valve casing; Fig. 12 is a view showing the valve plug and the ports therein; Fig. 13 is a section taken along the lines 13—13 of Fig. 12 and shows the safety channel and main pressure communicating port of the valve plug; Fig. 14 is an end view of the valve plug.

Referring now in detail to the drawings, reference character 1 indicates the valve casing with a rotatable plug 2 contained therein, outlets 3 of the casing communicate with the respective body actuating cylinders of the car and a pressure supply inlet 4. Extending transversely of the rotatable plug portion is an opening 5 adapted to selectively connect either of the cylinder outlets 3 to the pressure supply inlet 4. On the periphery of the plug portion is a channel 6 adapted to connect the inactive outlet of the valve to an exhaust port 7 of the casing which communicates to the atmosphere. A well 8 formed in the rotatable plug portion 2 is adapted to contain a lubricant and has openings connecting to the various frictional surfaces of the valve.

The chamber in the valve casing containing the rotatable plug portion 2 is closed at one end by cap 9 containing a spring 10 to hold the valve plug in place and the chamber is open at the other end to permit the extension of the handle receiving portion 11 of the valve plug. Fitted to this extension 11 is a handle 12 which is connected to the valve operating mechanism arm 13 by a handle 12^a. The valve operating mechanism comprises a transverse arm 14 extending beyond both sides of the car frame and connected at its center portion to the valve arm 13. On both sides of the car are indicating plates 15 through which the transverse arm 14 extends and which have marked thereon the positions assumed by the handle 16 when the car is dumping to one side or to the other and when the valve is set in a neutral position.

Near one end of the transverse arm 14 is provided means to prevent accidental displacement of the handle 16. This means comprises a support 17, spring 19 and locking arms 18 and 20. The support 17 is attached to the car underframe and carries the transverse arm 14. Contained within the support 17 and surrounding the transverse arm 14 is a spring 19 which is compressed at all times and which forces a member 18 into contact with a leg 17^a of the support 17. The member 18 is fastened to the arm 14 and has lugs

21 which are forced into engagement with spaced openings in the leg 17ª of the support. Secured to the arm 14, intermediate the handle 16 and indicating plate 15 is a member 20 which revolves with the operating arm 16 and has an opening 22 formed therein which registers with similar openings in the plate 15 as the operating arm assumes the various operative positions. Before turning the handle 16, sufficient effort must be applied to further compress the stiff spring 19 and free the lugs 21 of the member 18 from the openings in the member 17. Thus the handle 16 is held by this means against displacement during operation of the car and a padlock can be inserted through the coinciding openings in the indicating plate and opening 22 in the member 20 to prevent any turning of the handle while the car is in transit to its dumping destination.

Assuming the car to be positioned on the railway tracks and ready to discharge its contents towards the side at which the operator is standing, the operator would turn the handle 16 to the position shown as 16ª in the Fig. 4 of the drawings, and which reads on the marker plate "Dump this side". The handle 16, in turn, actuates the arms 14 and 13 to set the valve in the position as shown in Fig. 6 of the drawings. The pressure when admitted to the valve through the pressure inlet 4 passes through the transverse opening 5 in the valve plug and out through the cylinder outlet 3ª. Any pressure that may be in the inactive cylinder or the piping between such cylinder and the valve 1 would be permitted to escape through the cylinder outlet 3 into the channel 6 and out through the exhaust outlet 7 of the valve casing to the atmosphere, and thus permit the piston of the inactive cylinder to descend without damage to itself or the cylinder.

The type of dump car with which this valve is used is preferably of the trunnion bearing type and has the trunnions near the sides of the car so that the body when tilted has a preponderence of its weight towards the center of the underframe, thus when it is desired to right the body of the car, the flow of pressure to the body actuating cylinders which are holding the body in tilted position is cut off and the body returns to a horizontal position by reason of its own weight and the force of gravity. The descending body depresses the previously actuated piston of the cylinder and forces the remaining fluid pressure out through the valve to a suitable exhaust outlet, in the pressure supply line to the valve, and into the atmosphere.

Should the operator desire to tilt the car body to the opposite side from that at which he is standing he would turn the handle to the position marked 16ᵇ of Fig. 4. The valve plug would then assume the position as shown in Fig. 7 of the drawings and the pressure when turned into the car would actuate the proper body tilting cylinders. After the car has discharged its contents the operator cuts off the pressure supply to the valve and the body resumes a horizontal position as described above.

When it is desired to render any particular car inactive while a train of such cars is dumping, the handle 16 of the operating mechanism is turned to the position marked "Horizontal-neutral" on the marker plate. This causes the valve plug 2 to turn to the position as shown in Fig. 8 of the drawings; here the opening 5 of the plug communicating to the pressure inlet 4 is closed and the safety channel 6 communicates to both cylinder outlets 3 and 3ª and to the exhaust port 7 of the valve casing. When the pressure is turned into the line of cars it is stopped in this particular car at the inlet opening 4 and any seepage of the pressure past the valve plug 2 is caused to exhaust to the atmosphere through the channel 6 and the port 7, instead of building up in one of the cylinders and causing the car to dump.

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

1. In a pressure operated two-way dump car having body tilting cylinders and a pressure line, a body tilting control valve intermediate said cylinders and pressure line, said valve comprising an outer casing and an inner plug portion rotatable on its longitudinal axis interiorly of said casing, outlets in said casing to said cylinders and a pressure line inlet, a transverse opening through said rotatable plug portion connecting the pressure line to either outlet to the cylinders, an exhaust port in said casing and a channel in the periphery of said plug connecting said exhaust port and a cylinder outlet when the other of said cylinder outlets is connected through said plug to the pressure line.

2. In a pressure operated two-way dump car having body tilting cylinders and a pressure line, a body tilting control valve intermediate said cylinders and pressure line, said valve comprising an outer casing and an inner plug portion rotatable on its longitudinal axis interiorly of said casing, outlets in said casing to said cylinders and a pressure line inlet, a transverse opening through said rotatable plug connecting the pressure line to either cylinder outlet, an exhaust port in said casing and a channel in the periphery of said plug, said channel exhausting pressure from both operating cylinders when said pressure line inlet is closed.

3. In a pressure operated dump car having body tilting cylinders and a pressure line, a body tilting control valve intermediate said cylinders and pressure operating line, selectively connecting and disconnecting either or both of said cylinders and operating line,

an exhaust port in said valve casing and a channel in the periphery of the plug of said valve selectively connecting the inactive cylinder to the atmosphere.

4. In a pressure operated dump car having body tilting cylinders and a pressure line, a body tilting control valve intermediate said cylinders and pressure line, selectively admitting pressure to either of said cylinders, means operating said valve and extending through an indicator plate on the exterior of said car, said extension of means cooperating with said plate to indicate the side to which said car is dumping.

5. In a pressure operated dump car, valve means for selectively controlling the tilting of said car, means extending transversely of the car for operating said valve control, an indicator plate on the exterior of said car cooperating with said valve operating means to show the direction of tilting of said body, and openings in said plate to receive means for locking said valve operating means in position.

6. In a two-way pressure operated dump car, means comprising pressure operated body tilting cylinders, a pressure line and an operating valve intermediate said cylinders and pressure line for selectively controlling the tilting of said car, a mechanism for operating said valve, said mechanism extending from said valve to the exterior of said car cooperating with a suitable marked plate to indicate the direction of tilting of said body.

7. In a pressure operated dump car having body tilting cylinders and a pressure line, a control valve intermediate said pressure line and body tilting cylinders, a transverse shaft beneath the body for operating said valve, handles on said shaft cooperating with markings on the sides of the car for indicating the direction of tilting, automatic means at the side of said car for maintaining said handles in operating position.

8. In a pressure operated dump car having body tilting cylinders and a pressure line, a control valve intermediate said pressure line and body tilting cylinders, a transverse shaft beneath the body for operating said valve, handles on said shaft cooperating with markings on the sides of the body for indicating the direction of tilt of said body, means at the side of said car for preventing accidental movement of said shaft, said means comprising a member for supporting said shaft, a member on said shaft engaging said supporting member and a compression member holding said last mentioned member in engagement with said supporting member.

In testimony whereof, we affix our signatures.

ALFRED C. SCHMOHL.
JOHN P. ANDERSON.