

A. E. HOERMANN.  
DUMPING DEVICE.  
APPLICATION FILED NOV. 5, 1907.

915,179.

Patented Mar. 16, 1909.

Fig. 1.

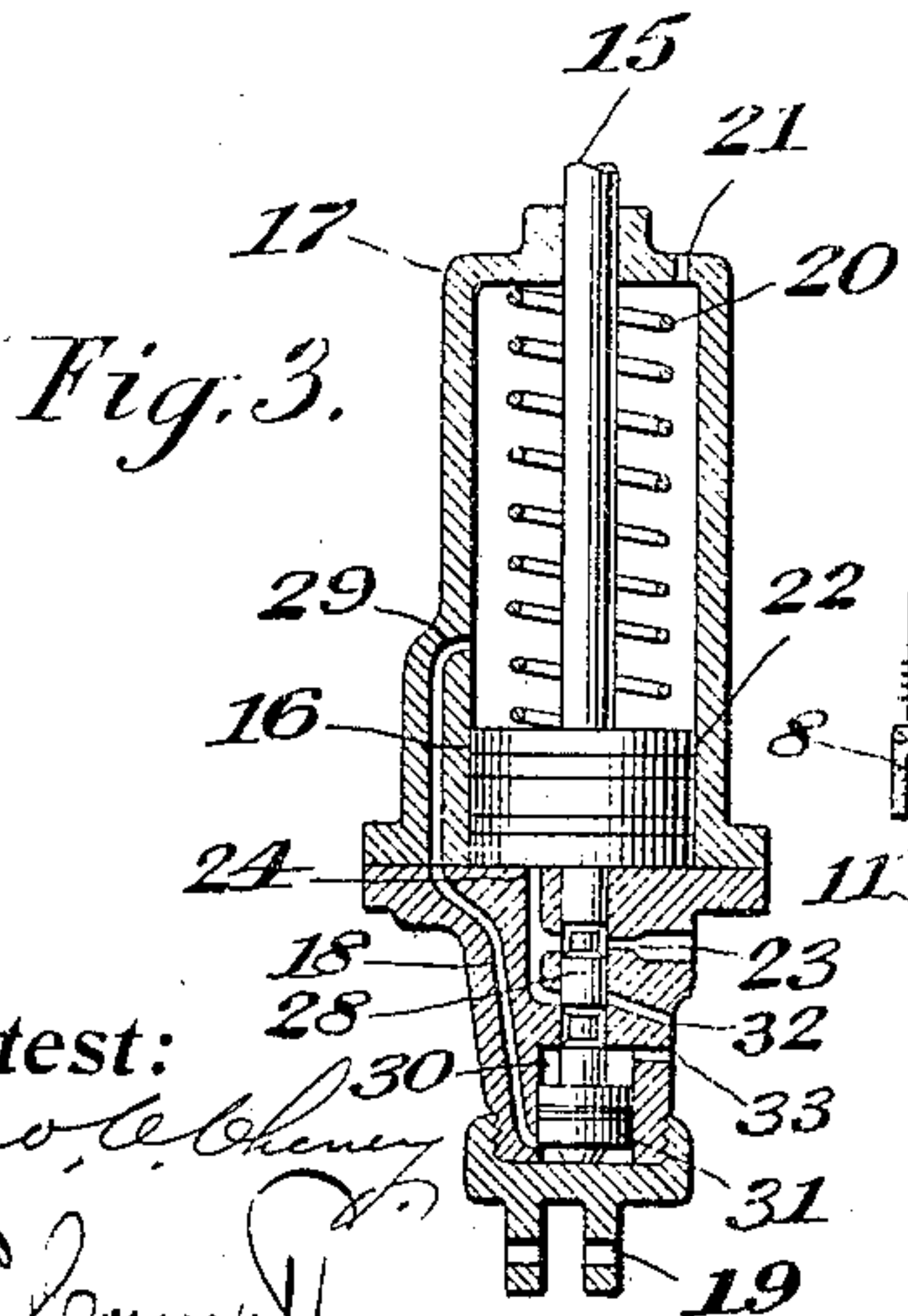
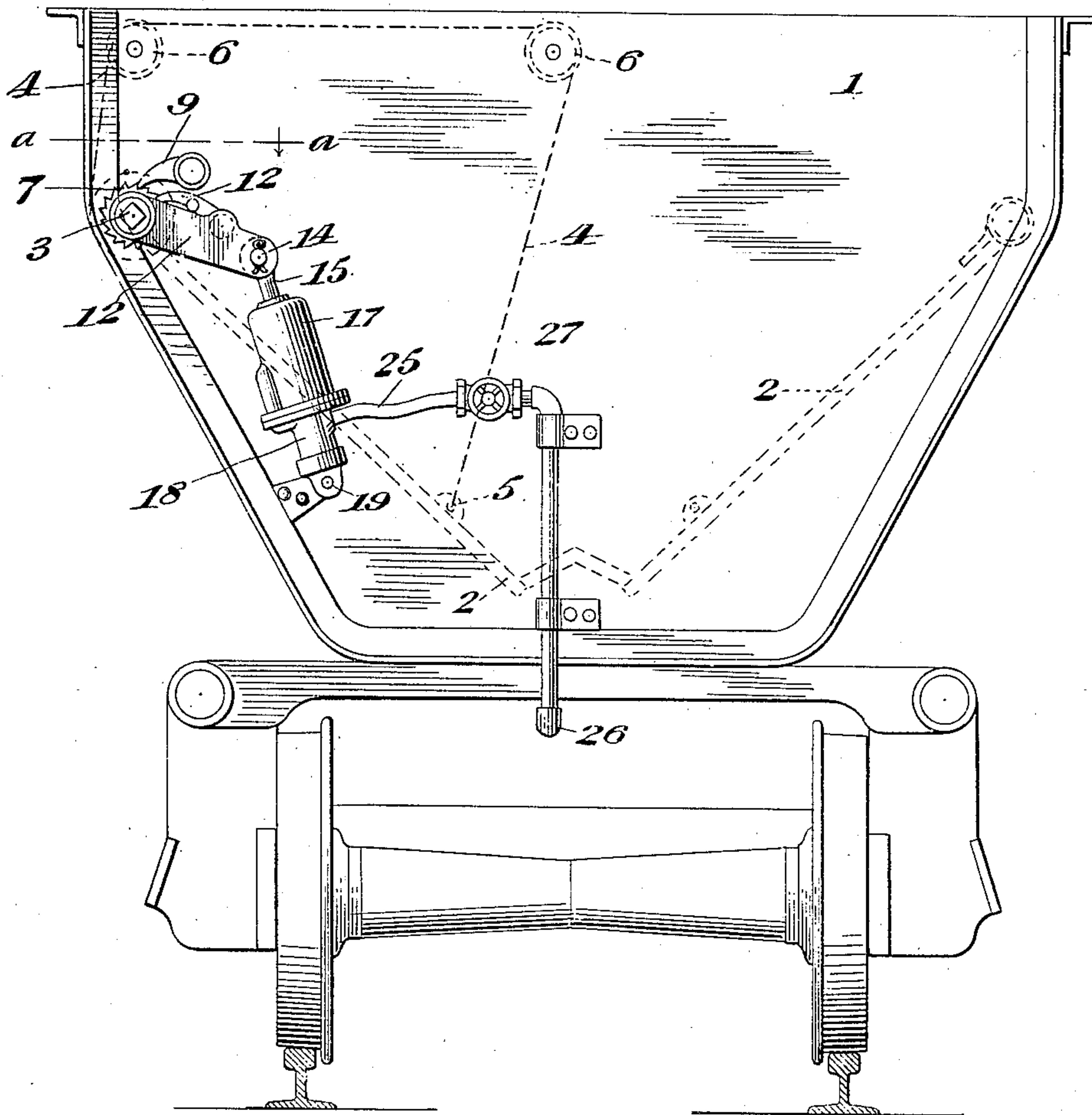


Fig. 3.

Fig. 4.

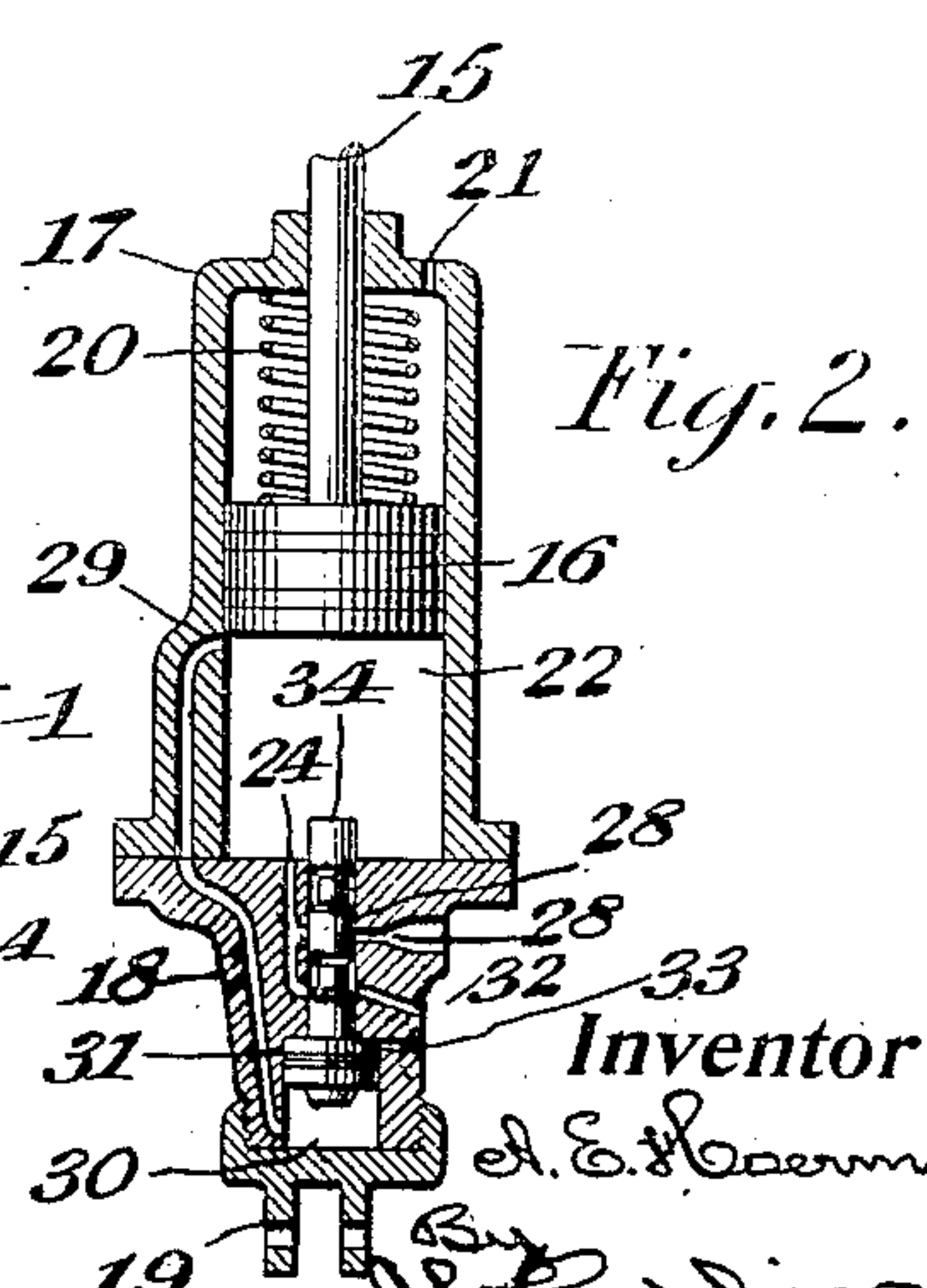
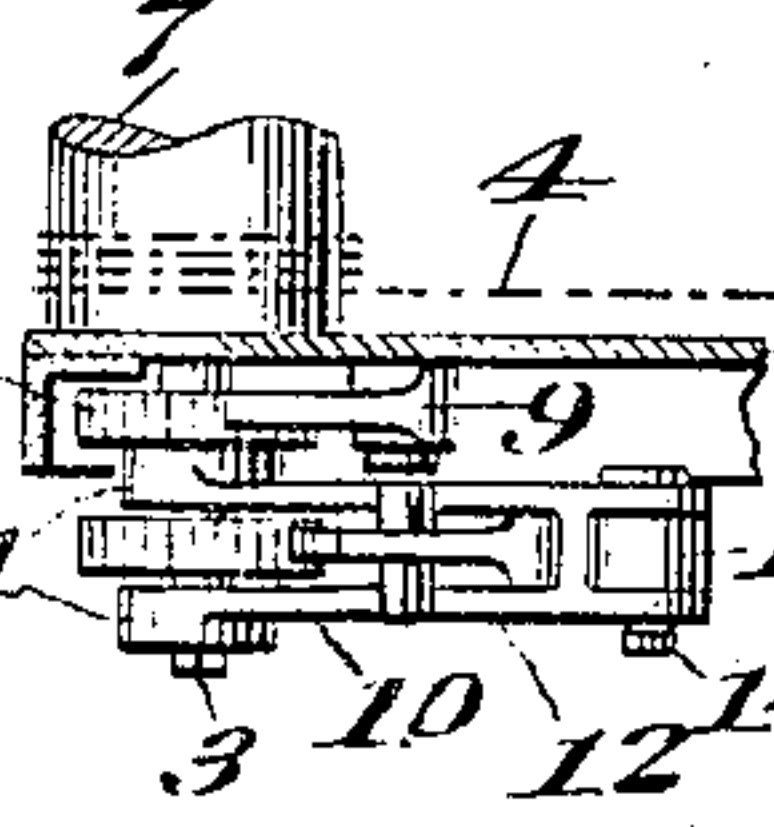


Fig. 2.

Attest:  
*[Signature]*  
A. P. Leonard

Inventor:  
A. E. Hoermann  
By *[Signature]*  
Atty



# UNITED STATES PATENT OFFICE.

ALFRED E. HOERMANN, OF NEW YORK, N. Y.

## DUMPING DEVICE.

No. 915,179.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed November 5, 1907. Serial No. 400,754.

*To all whom it may concern:*

Be it known that I, ALFRED E. HOERMANN, a citizen of the United States, residing in the city, county, and State of New York, have  
5 invented certain new and useful Improvements in Dumping Devices, of which the following is a specification.

This invention relates to certain improvements in dumping devices, and more particularly in such devices as are especially designed and adapted for employment upon  
10 railway dumping cars and the like, and the object of the invention is to provide a dumping device of this general character and of a simple and comparatively inexpensive nature  
15 which shall be capable of operation in a substantially automatic manner whereby a material economy in time is effected and the employment of manual operating means is  
20 obviated.

The invention consists in certain novel features of the construction, and combinations and arrangements of the several parts of the improved dumping device, whereby  
25 certain important advantages are attained and the device is rendered simpler, cheaper and otherwise better adapted and more convenient for use, all as will be more fully hereinafter described.

30 The novel features of the invention will be carefully defined in the claims.

In the accompanying drawing which serves to illustrate my invention—Figure 1 is an  
35 end view showing a railway dumping car provided with my improvements; Fig. 2 is an enlarged sectional view showing certain features of construction of the actuating means of the dumping device; Fig. 3 is a view similar to Fig. 2, but showing the parts of the  
40 actuating means moved to a different position, and Fig. 4 is a sectional detail view taken in the plane indicated by the line *a—*  
in Fig. 1.

In these views 1 represents the body of a  
45 railway dumping car, which may be of any desired type, being herein shown as provided with dumping gates 2, 2 extended along its opposite lateral sides, said gates being pivotally mounted at their upper ends upon  
50 shafts 3 extended along the sides of the car body at the upper part thereof and being thence extended, when in closed adjustment, in directions inclined toward each other at the central part of the lower portion of the  
55 car body so that when the car is loaded the weight of the contents will be imposed upon

said inclined gates in such a way as to be adapted to throw the gates, when released, outwardly into open position, whereby such contents may be dumped. 60

Since the dumping devices at opposite sides of the car are usually exactly similar, being merely duplicated to permit the contents of the car to be dumped toward either side of the track, as may be desired, I have  
65 herein illustrated in detail only one of the said dumping devices.

4 represents a chain or other flexible connection, the lower end of which has connection at 5 with the lower part of the dumping  
70 gate 2, said chain being thence carried upward and laterally toward the side of the car over sheaves 6, 6 or the like, and having its opposite end extended downward at the side of the car and connected to wind upon a  
75 drum 7, held upon the shaft 3 whereon the upper edge portion of the gate is pivotally hung. The shaft 3 is capable of turning movement independently of the movement of the gates 2, and the chain 4, sheaves 6, 6  
80 and drum 7 will be by preference duplicated in order to equalize the movement of the parts.

At the outside of the end of the car body, the shaft 3 has a ratchet wheel 8 fixed upon  
85 it, and 9 represents a holding pawl or detent pivoted on the car body in position for engagement with the teeth of the ratchet wheel 8 whereby it will be seen that said pawl or dog acts to prevent back rotation of the shaft  
90 3 when the chain 4 is wound upon the drum 7 whereby the gate 2 is effectively held in closed position as shown in dotted lines in Fig. 1 when the dog or pawl 9 is engaged with the teeth of the ratchet wheel. When the  
95 dog or pawl is raised to disengage it from the teeth of the ratchet wheel 8, however, the shaft 3 is permitted to turn freely so that the gate 2 is allowed to drop to opened position under the weight of the load imposed  
100 thereon.

In connection with the parts above described, I provide means adapted for operation in a substantially automatic manner for rotating the shaft 3 in such a way as to wind  
105 the chain 4 upon the drum 7 to again raise the gate 2 to its closed position shown in dotted lines in Fig. 1, and this means I will now describe.

11 represents a forked arm pivoted upon  
110 the end of shaft 3 outside the end of the car body, and 12 represents a pawl carried upon



the arm and engaged with the teeth of a ratchet wheel 10 fixed on the shaft 3 between the forks of said arm 11 in such a way as to operate to turn the shaft 3 in unison with the rocking of said arm so as to wind up the chain upon the drum 7 to close the gate 2. This pawl 12 must also be lifted out of engagement with the teeth of ratchet wheel 10 when the pawl 9 is disengaged from ratchet wheel 8 to permit opening of the gate 2.

The outer end of the arm 11 has pivotal connection at 14 with the upper end of a piston rod 15, the lower end of which carries a piston 16 arranged for reciprocatory movement in a cylinder 17, the lower end of which has pivotal connection, as shown at 19, with a bracket held upon the end of the car body, the arrangement being such that when the reciprocatory movement is imparted to the piston 16 to rock the arm 11 upon shaft 3, and thereby impart intermittent rotative movement to said shaft to wind up the chain 4 upon the drum 7, the cylinder is permitted to rock upon its pivotal connection at 19 to compensate for the swinging movement of the arm 11 upon said shaft 3.

20 represents a spring coiled upon the piston rod 15 within the upper part of the cylinder 17, its lower end being engaged on the piston 16 in such a way that the tension of said spring is normally exerted to press said piston down toward the bottom of the cylinder to the position shown in Fig. 3, whereby the arm 11 is permitted to be lowered to the position shown in Fig. 1.

22 represents the chamber formed in cylinder 17 below piston 16, there being a port 24 extended in the valve casing 18 from the bottom of the chamber 22, and said port 24 is adapted for communication with laterally extended ducts or ports 23 and 32 produced in the valve casing 18, fluid under pressure being adapted to be supplied to port or duct 23 by way of a flexible hose 25 from a pipe 26 which may be the train pipe of an air brake system or may be a separate pipe extended along the length of the train and adapted to contain fluid (preferably air) under pressure.

A valve or cock 27 is arranged to control the supply of the fluid under pressure to the flexible hose 25 and thence to the ports 23 and 24 and chamber 22 of cylinder 17, and after the gate 2 has been opened to dump the contents of the car, and the pawls 9 and 12 have been returned to engagement with the ratchet wheels 8 and 10, the said cock or valve 27 is opened to permit fluid under pressure to be admitted into the chamber 22 wherein it operates to lift the piston to the position shown in Fig. 2, whereby the arm 11 is rocked upon shaft 3 and a partial turn is imparted by the ratchet mechanism to said shaft to wind up the chain 4 and move gate 2 toward its closed position. As the piston 16 reaches its uppermost position in

cylinder 17, as seen in Fig. 2, a port 29 is opened in one wall of the cylinder, which port is extended down along the side of the cylinder and has communication with a chamber 30 at the base of the valve casing 18, there being in said chamber 30 a piston 31 carried upon the lower end of a valve stem 34, which is extended up through the valve casing in alinement with the axis of the cylinder 17. By this arrangement, as the upper end of port 29 is opened upon the ascent of piston 16, the fluid under pressure in chamber 22 is permitted to flow down through said port so as to exert its tension in chamber 30 in such a way as to lift the piston 31 in said chamber, and to elevate the valve stem 34 connected with said piston to the position shown in Fig. 2 whereby the upper end of said valve stem is caused to project upward into the lower part of the chamber 22 in position to be engaged by the piston 16 when the same is moved downward by gravity and the tension of spring 20. 33 is a vent for the discharge of air at the upper part of the chamber 30 upon the ascent of piston 31. In this upward movement of the valve stem 34, a valve 28 carried thereby is moved into position to close communication from port or duct 23 to duct 24 whereby the supply of fluid from the pipe 26 to chamber 22 is interrupted. The valve 28 is also adapted to control communication between port or duct 32 and port 24, and when its lowered position serves to occlude said port or duct 32 so as to prevent the escape of fluid therethrough, but when the said valve 28 is moved upwardly to the position shown in Fig. 2, to close communication between ports 23 and 24 and thereby interrupt the supply of fluid under pressure to chamber 22, communication is established between ports 23 and 32 whereby the fluid under pressure in said chamber 22 is permitted to exhaust through port 32, so that upon suitable lowering of pressure in said chamber 22 the spring 20 is permitted to press piston 16 downwardly toward the lower end of the cylinder and arm 11 is again permitted to swing downward to the position shown in Fig. 1, the pawl 12 riding upon the teeth of the ratchet wheel 10. As the piston 16 descends in cylinder 17, it comes in contact with the upwardly extended part of valve stem 34 and serves to again depress said stem to the lowered position shown in Fig. 3, whereby the valve 20 is again moved to open communication from port 23 to port 24 and to interrupt communication from port 24 to port 32, the fluid under pressure from pipe 26 being thereby again admitted to chamber 22 wherein it again operates to elevate piston 16 as before described. In the downward movement of the piston 16, the upper end of port 29 is brought into communication with the interior of the cyl-



inder 17 above said piston, and the fluid under pressure contained in the chamber 30 at the base of the valve casing 18 is thereby permitted to escape into the upper part of the cylinder, wherefrom it is discharged at a vent 21. In this way no resistance is offered to the downward movement of the piston 31 when the piston 16 contacts with the valve stem 34. By this arrangement it will be seen that so soon as the contents of the car is dumped, and the cock or valve 27 is opened to supply fluid under pressure from pipe 26, the piston 16 is set into rapid reciprocatory movement so as to cause intermittent rotatory movement to be imparted to shaft 3 in such a way as to wind up chain 4 upon drum 7 and thereby return the gate 2 to its closed position. By this construction it will be seen that manual actuation of the dumping device for returning the gate to closed position is altogether dispensed with, whereby a considerable saving of time and labor is effected which is particularly advantageous where my improvements are applied to railway cars, the only manual operation required being that necessary to raise pawls 9 and 12 and to turn on and off the supply of air at the cock 27. Where the pipe 26 is separate from the air brake or other ordinary train service pipe, the cock 27 may be left open at all times and control of the fluid pressure supply may be effected at the engine for the entire train.

From the above description it will be seen that the improved dumping device constructed according to my invention is of an extremely simple and comparatively inexpensive nature and is particularly well adapted for use by reason of the convenience and facility attendant upon its operation, and it will also be obvious from the description that the device is susceptible of some modification without material departure from the principles and spirit of the invention, and for this reason I do not desire to be understood as limiting myself to the precise form and arrangement of the several parts herein set forth in carrying out my invention in practice.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. A dumping device for railway cars and the like having mechanism adapted for operation by fluid pressure and connected to impart intermittent movement to said dumping device.

2. A dumping device for railway cars and the like having reciprocatory mechanism adapted for operation by fluid pressure and connected to actuate said dumping device, said mechanism having self-controlled valve operating means.

3. A dumping device for railway cars and the like having reciprocatory mechanism

adapted for operation by fluid pressure and connected to actuate said dumping device, and self-controlled means arranged for alternate operation to first supply fluid under pressure to said actuating mechanism and then to exhaust such fluid under pressure therefrom.

4. A dumping device for railway cars and the like having mechanism adapted for operation by fluid pressure and connected to actuate said dumping device and means, controlled in unison with the movement of the dumping device, for supplying fluid under pressure to said actuating mechanism.

5. A dumping device for railway cars and the like having mechanism adapted for operation by fluid pressure and connected to actuate said dumping device and means, controlled from the operation of said actuating mechanism, for supplying fluid under pressure thereto.

6. A dumping device for railway cars and the like having reciprocatory mechanism adapted for operation by fluid pressure and connected to actuate said dumping device and means, controlled in unison with the movement of the dumping device, and arranged for alternate operation to first supply fluid under pressure to said actuating mechanism and then to exhaust such fluid under pressure therefrom.

7. A dumping device for railway cars and the like having reciprocatory mechanism adapted for operation by fluid pressure and connected to actuate said dumping device and means, controlled from the operation of said mechanism and arranged for alternate operation to first supply fluid under pressure to said actuating mechanism and then to exhaust such fluid under pressure therefrom.

8. A dumping device comprising a part mounted for movement in and out of dumping position, a shaft mounted to turn and having connection with said part to move the same, reciprocatory mechanism adapted for actuation by fluid pressure, and ratchet mechanism actuated from the reciprocatory mechanism and connected to impart intermittent turning movement to said shaft.

9. A dumping device for railway cars and the like comprising a gate movable into opened or closed position, ratchet mechanism connected with said gate to move the same, and reciprocatory mechanism adapted for operation by fluid pressure and connected to actuate said ratchet mechanism.

10. A device of the character described comprising a pivotally mounted cylinder, a piston in the cylinder, means to impart reciprocatory movement to the piston, a dumping gate, and ratchet mechanism for operating said dumping gate and comprising a pivotally mounted arm connected with and actuated from said piston.

11. A device of the character described



comprising a pivotally mounted cylinder, a piston in the cylinder, means to impart reciprocatory movement to the piston, a part mounted to rotate, a dumping gate  
3 having connections arranged to wind on said rotative part, an arm mounted for pivotal movement relatively to said rotative part, a connection for moving said arm from the piston in said cylinder, and means for im-

parting intermittent movement to said rota- 10  
tive part from the movement of said arm.

In witness whereof I have hereunto signed my name this 2nd day of November 1907, in the presence of two subscribing witnesses.

ALFRED E. HOERMANN.

Witnesses:

JEROME EISNER,

GEORGE MALRISON.