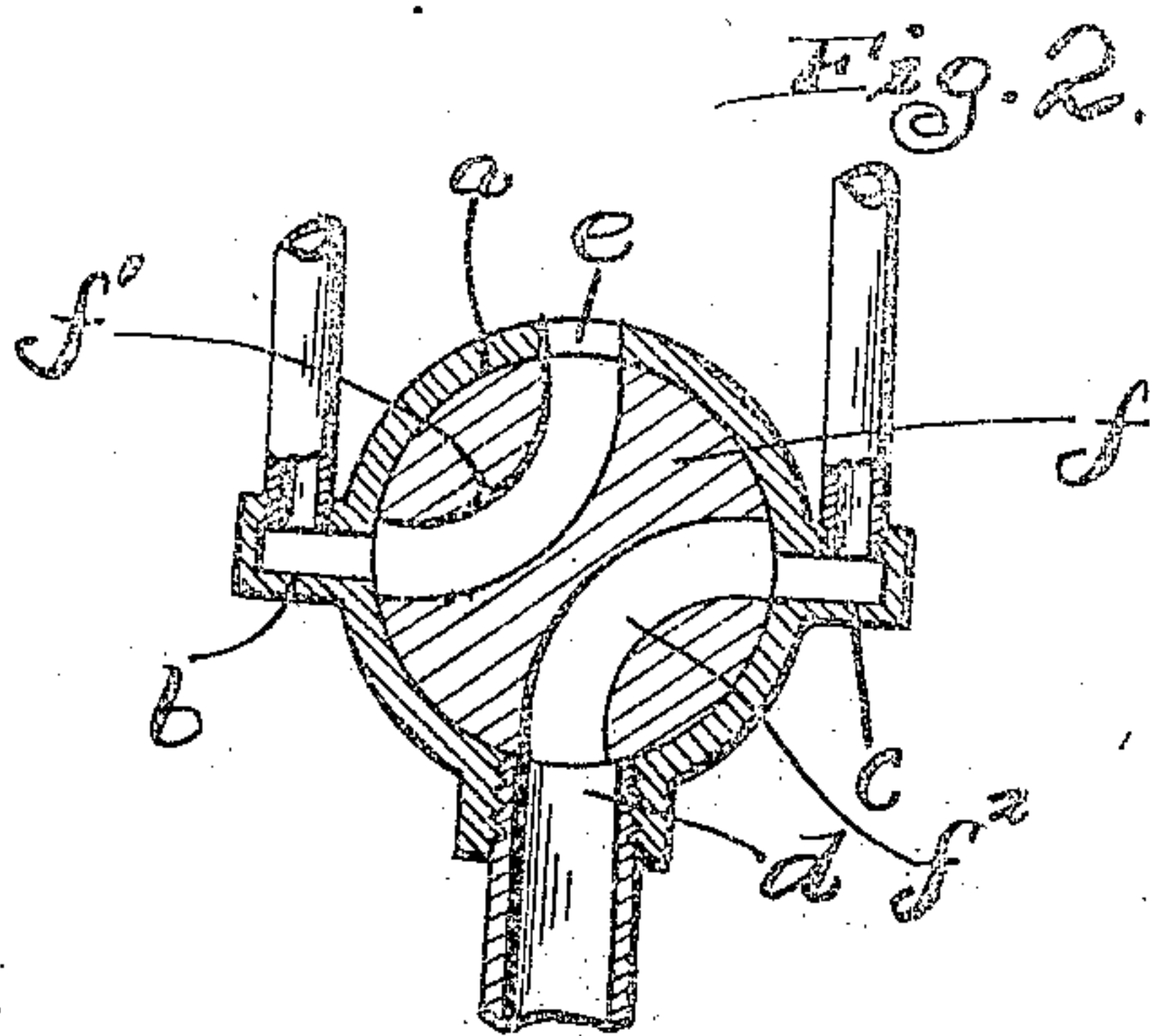
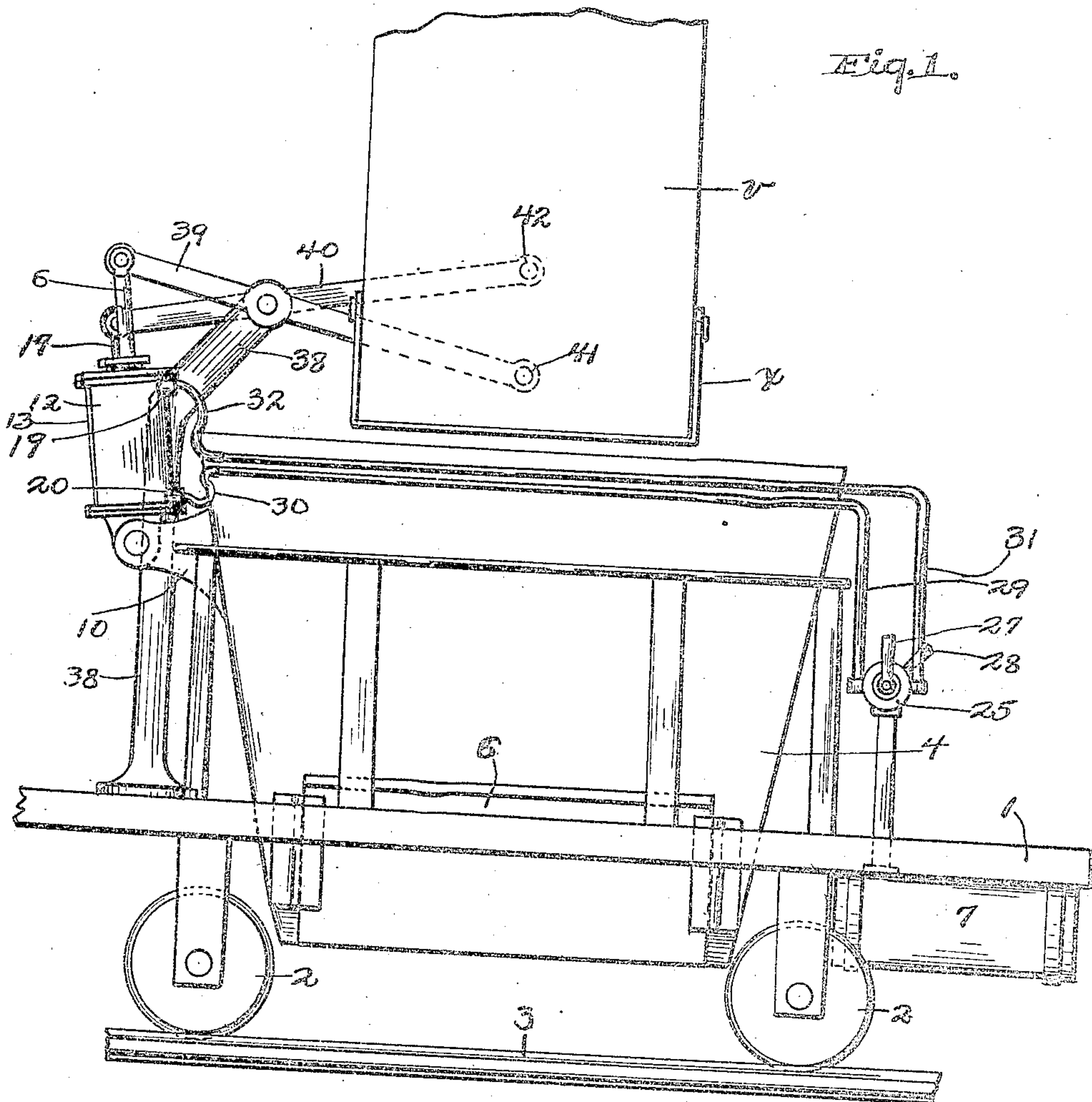


No. 881,146.

C. L. PENNELL. PATENTED MAR. 10, 1908.
ORE CAR.
APPLICATION FILED DEC. 7, 1907.

2 SHEETS—SHEET 1.



WITNESSES:
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B. C. Brown

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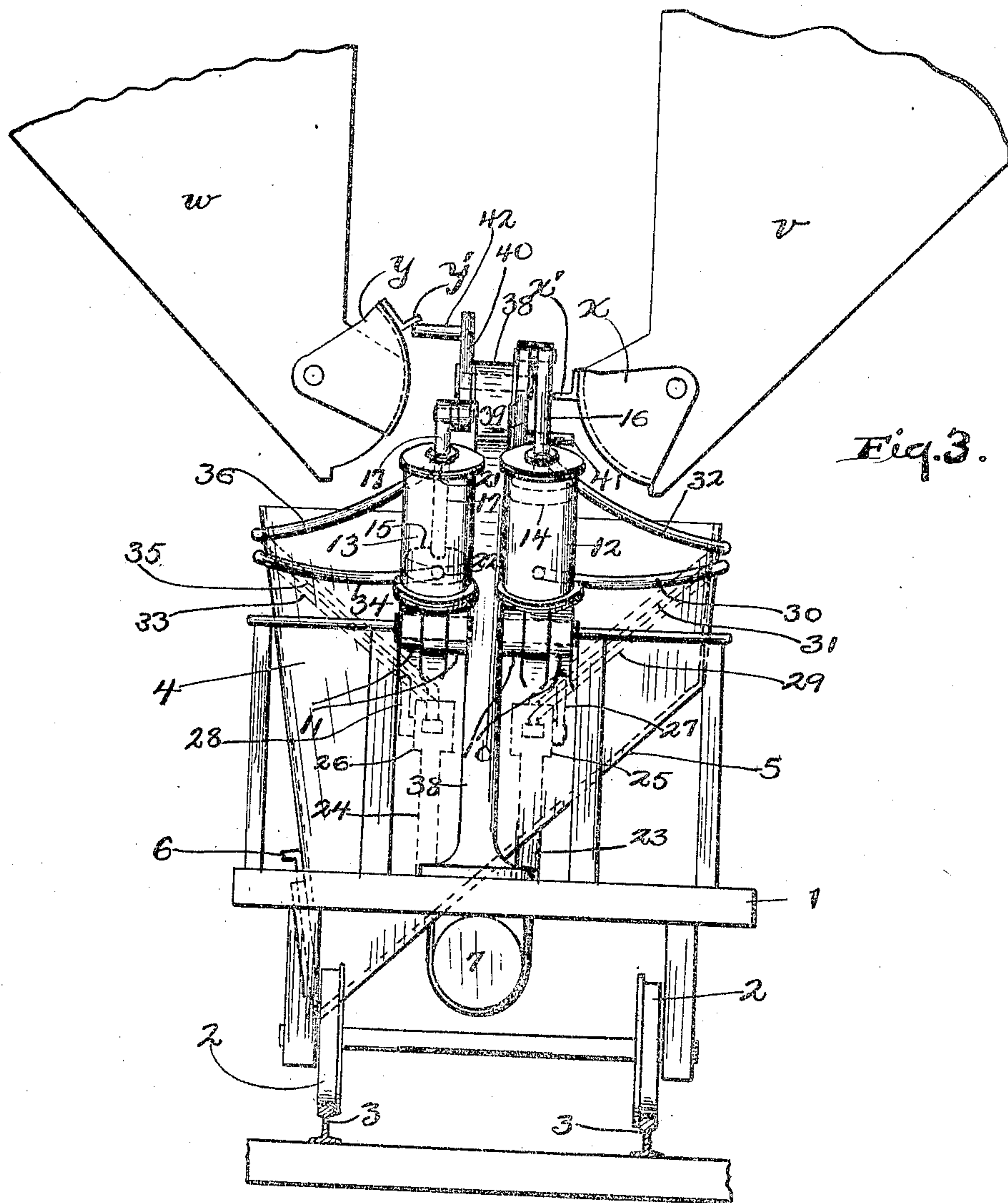
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WITNESSES:

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CHARLES L. PENNELL, OF CANAL DOVER, OHIO, ASSIGNOR OF ONE-HALF TO CHARLES WAGNER, OF CANAL DOVER, OHIO.

ORE-CAR.

No. 831,143.

Specification of Letters Patent.

Patented March 10, 1903.

Application filed December 7, 1907. Serial No. 405,005.

To all whom it may concern:

Be it known that I, CHARLES L. PENNELL, a citizen of the United States of America, residing at Canal Dover, in the county of Tuscarawas and State of Ohio, have invented certain new and useful Improvements in Ore-Cars; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in ore cars and especially to cars used in feeding furnaces. When cars are used for this purpose a predetermined quantity of ore, coke and other material is supplied to a car to constitute a single load, and in order that the car may receive the proper quantity of each material it is customary to provide hoppers located at each side of the track on which the car runs and the spouts or outlets of the hoppers are arranged to project over the car so that the contents thereof can pour directly into the car. The spouts of the hoppers are closed by suitable doors.

The object of the invention, therefore, is to provide in combination with such a car means for opening the doors of the hoppers as the car passes beneath the hoppers.

The invention therefore consists in providing pneumatically operated means for raising the doors of the hoppers.

The invention also consists in the features of construction and combination of parts described in the specification, pointed out in the claims and illustrated in the accompanying drawings.

In the accompanying drawings, Figure 1 is a side view of a car embodying my invention, showing the lower portion of two hoppers. Fig. 2 is a detail sectional view of one of the controlling valves. Fig. 3 is an end elevation of the car showing the lower portion of two hoppers.

Again referring to the drawings 1 represents the frame of a car which is provided with the usual wheels 2 adapted to run on a track 3. On the frame 1 is mounted the car body 4 which is preferably of the hopper construction having an inclined bottom 5 and it is also provided with a sliding door 6 at its deepest side. On the frame of the car is mounted a tank 7 for holding compressed air or other suitable fluid. On the end of the body 4 of the car are arranged brackets

10 and 11 on which are pivotally supported cylinders 12 and 13. In the respective cylinders 12 and 13 are arranged pistons 14 and 15 which are provided with piston rods 16 and 17, respectively, which extend through the upper ends of the cylinders. The cylinder 12 is provided with a port 19 at its upper end and a port 20 at its lower end and the cylinder 13 is provided with a port 21 at its upper end and a port 22 at its lower end. Two vertical pipes 23 and 24 communicate with the tank 7 and are provided with valves 25 and 26 respectively.

The valves 25 and 26 are identical in construction and as shown in Fig. 2 each has a valve chamber *a* having two supply outlets *b* and *c*, an intake *d* and an outlet or exhaust *e*. The valve proper *f* is provided with two curved passageways *f'* and *f''* so that by rotating the valve one supply port can be caused to communicate with the intake and the other supply port can be caused to communicate with the exhaust. Handles 27 and 28 are provided for operating the respective valves. A pipe 29 is connected at one end with one of the supply outlets of the valve 25 and at its other end is connected to the end of a flexible tube 30 the other end of which communicates with the port at the lower end of the cylinder 12, and the pipe 31 is connected at one end with the other supply outlet of the valve 25 and at its other end is connected to a flexible tube 32 which communicates with the port at the upper end of the cylinder 12. A pipe 33 is connected at one end with one of the supply outlets of the valve 26 and at its other end is connected to one end of a flexible tube 34, the other end of which communicates with the port at the lower end of the cylinder 13, and a pipe 35 is connected at one end with the other supply outlet of the valve 26 and at its other end is connected with a flexible tube 36 which communicates with the port at the upper end of the cylinder 13.

A standard 38 is mounted on the frame of the car between the cylinders 12 and 13 and extends above said cylinders and on said standard are fulcrumed two levers 39 and 40. The lever 39 is connected with the piston rod 16 of the cylinder 12 and the lever 40 is connected with the piston rod 17 of the cylinder 13. On the free ends of the levers are preferably mounted rollers 41 and 42 respectively.

In Figs. 1 and 3 *v* and *w* represent the spouts of two hoppers of the usual construction which are provided with gates or doors *x* and *y* respectively which are pivotally secured to the hoppers so that they may be swung up in order to open the hoppers. The doors are preferably provided with ears or projections *x'* and *y'*.

The operation of the car is as follows.
 10 When it is desired to fill the car from the bins *v* and *w* the car is run between the bins so that the free ends of the levers are beneath the projections on the doors of the bins. Now if it is desired to open the door
 15 *y* of the bin *w* the valve 26 is turned so as to permit the compressed air from the tank 7 to pass through the pipe 35 and the tube 36 into the cylinder 13 above the piston 15 which forces down the piston thereby elevating the free end of the lever 40 and bringing
 20 the roller on the end thereof in contact with the projections *y'* on the door *y* thereby raising the door, as shown in Fig. 3. When a sufficient quantity of material has been
 25 withdrawn from the bin *w* the valve 26 is operated so as to allow the compressed air from the tank 7 to pass through the pipe 33 and the tube 34 and enter the cylinder 13 below the piston 15 thereby shoving up the
 30 piston and lowering the free end of the lever 40 which allows the door *w* to close by its own weight. Or if it is desired to open the bin *v* the valve 25 is operated so as to allow the compressed air from the tank 7 to pass
 35 through the pipe 31 and the flexible tube 32 into the cylinder 12 above the piston 14 thereby forcing the piston down in the cylinder 12 and consequently raising the free end of the lever 39 which will come in contact
 40 with the projection *x'* on the door *x* and lift the door and in like manner when it is desired to close the door *x* the valve 25 is operated so as to allow the compressed air from the tank 7 to pass through the pipe 29 and
 45 the tube 30 and enter the cylinder 12 beneath the piston 14 thereby forcing up the piston 14 and consequently lowering the free end of the lever 39 permitting the door *x* to close by its own weight. The pivotal
 50 support of the cylinders 12 and 13 permit them to rock back and forth, thereby accommodating themselves to the movements of the ends of the levers, which of course describe an arc of a circle as they move up
 55 and down.

What I claim is,—

1. In a device for operating doors of hoppers, the combination with a car of a cylinder mounted on said car, a piston arranged in
 60 said cylinder and provided with a piston rod which extends through one end of said cylinder, means for actuating said piston in said

cylinder and means for forming an operative connection between said piston rod and the door of a hopper when the car is beneath the
 65 hopper so that the movement of said piston rod will open the door of said hopper.

2. In a device for operating doors of hoppers, the combination with a car of a cylinder pivotally mounted on said car, a piston arranged in said cylinder and provided with a
 70 piston rod which projects beyond one end of said cylinder, means for actuating said piston in said cylinder and means for forming an operative connection between said piston
 75 rod and the door of a hopper when the car is under said hopper so that the movement of said piston rod will open the door thereof.

3. In a device for operating the doors of hoppers, the combination with a car of a
 80 tank for holding a fluid under pressure mounted on said car, a cylinder pivotally mounted on said car, a piston arranged in said cylinder and provided with a piston rod, pipes connecting the upper and lower
 85 ends of said cylinder with said tank and a valve controlling the passage of the fluid from the tank to said cylinder.

4. In a device for operating the doors of hoppers, the combination with a car of a
 90 tank for holding fluid under pressure arranged on said car, a pair of cylinders mounted on said car, pistons arranged in said cylinders and provided with piston rods, pipes connecting the upper and lower ends of
 95 said cylinders with said tank, valves for controlling the passage of said fluid through said pipes, a pair of levers fulcrumed on said car and operatively connected with said
 100 piston rods and means for causing said levers to engage with the doors of the hoppers when the car is under the hoppers.

5. In a device for operating the doors of hoppers, the combination with a car of a
 105 tank for holding fluid under pressure arranged on said car, a pair of cylinders pivotally mounted on said car, pistons arranged in said cylinders and provided with piston rods, pipes connecting the upper and lower
 110 ends of said cylinders with said tank, valves for controlling the passage of fluid through said pipes, a pair of levers fulcrumed on said car and operatively connected with said
 115 piston rods and rollers arranged on the free ends of said levers, substantially as described and for the purpose set forth.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

CHARLES L. PENNELL.

Witnesses:

VICTOR C. LYNCH,
 N. L. McDONNELL.