

907,277.

W. J. OLIVER.

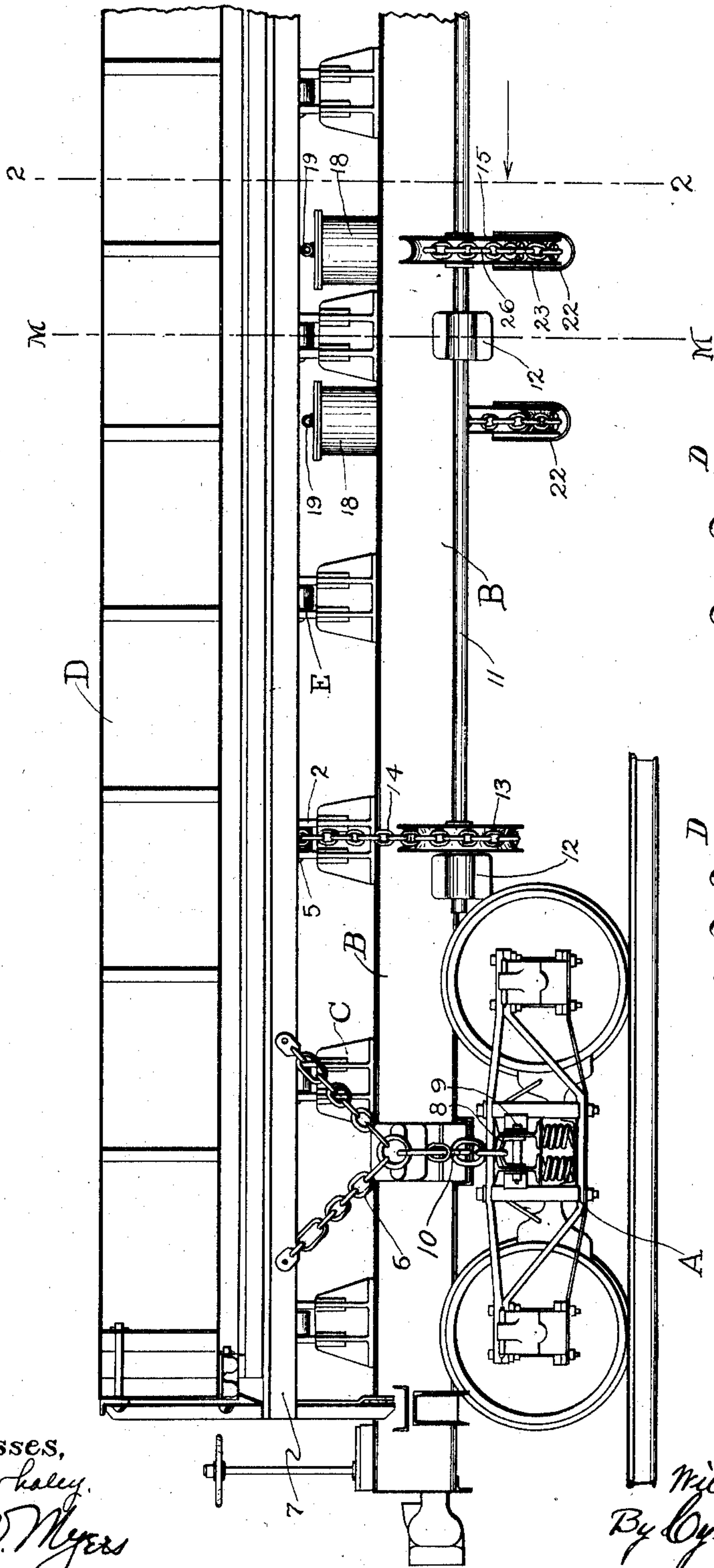
DUMP CAR.

APPLICATION FILED JUNE 17, 1908.

Patented Dec. 22, 1908.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses,  
Wm. W. Haley.  
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Fig. 7.

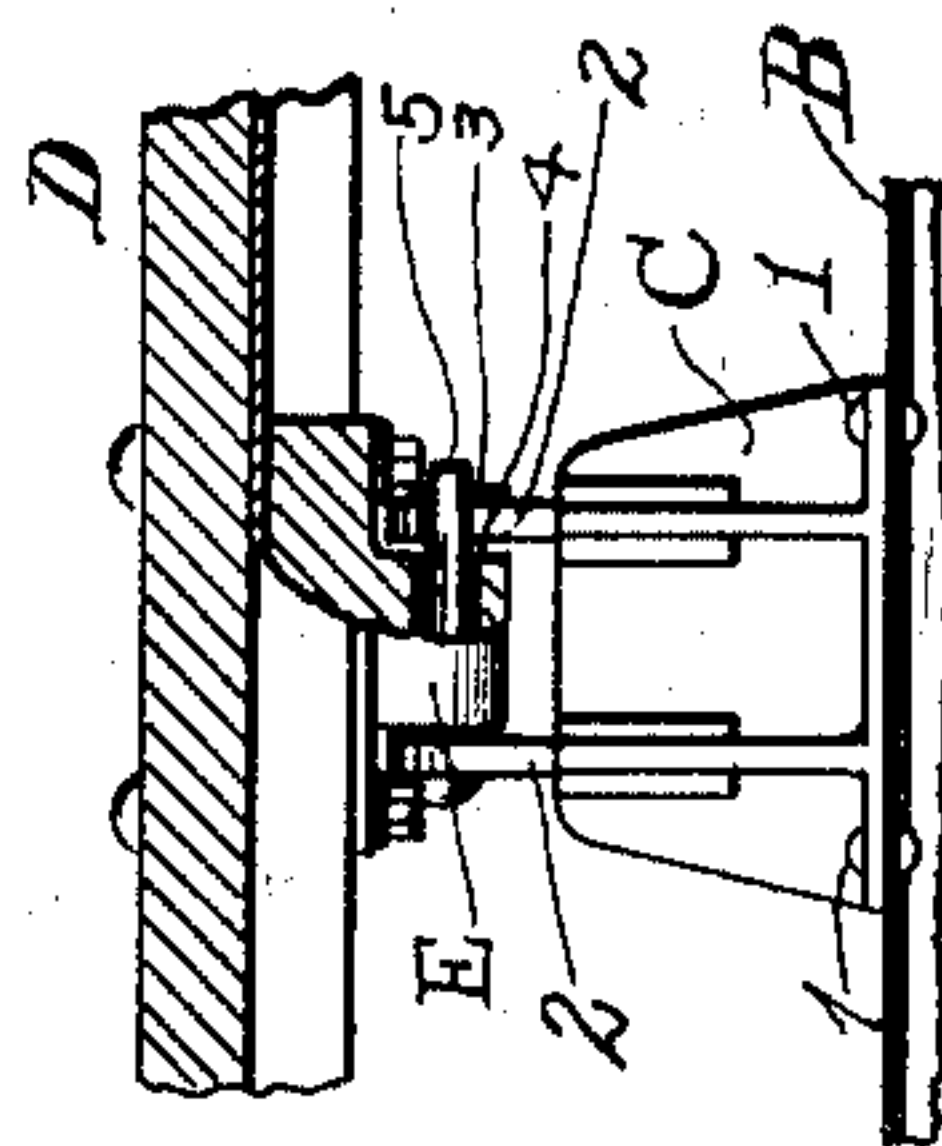
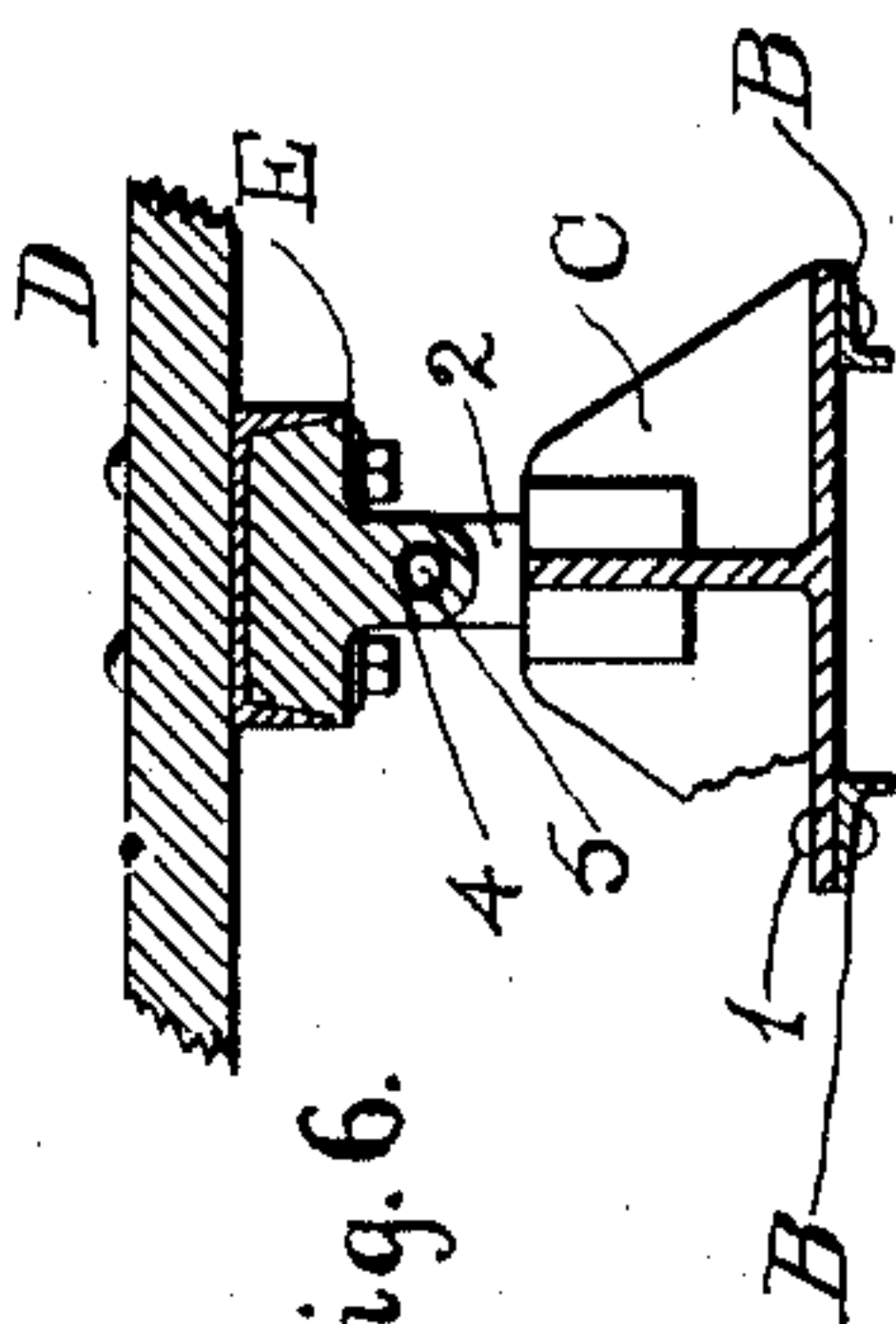


Fig. 6.



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3 SHEETS—SHEET 2.

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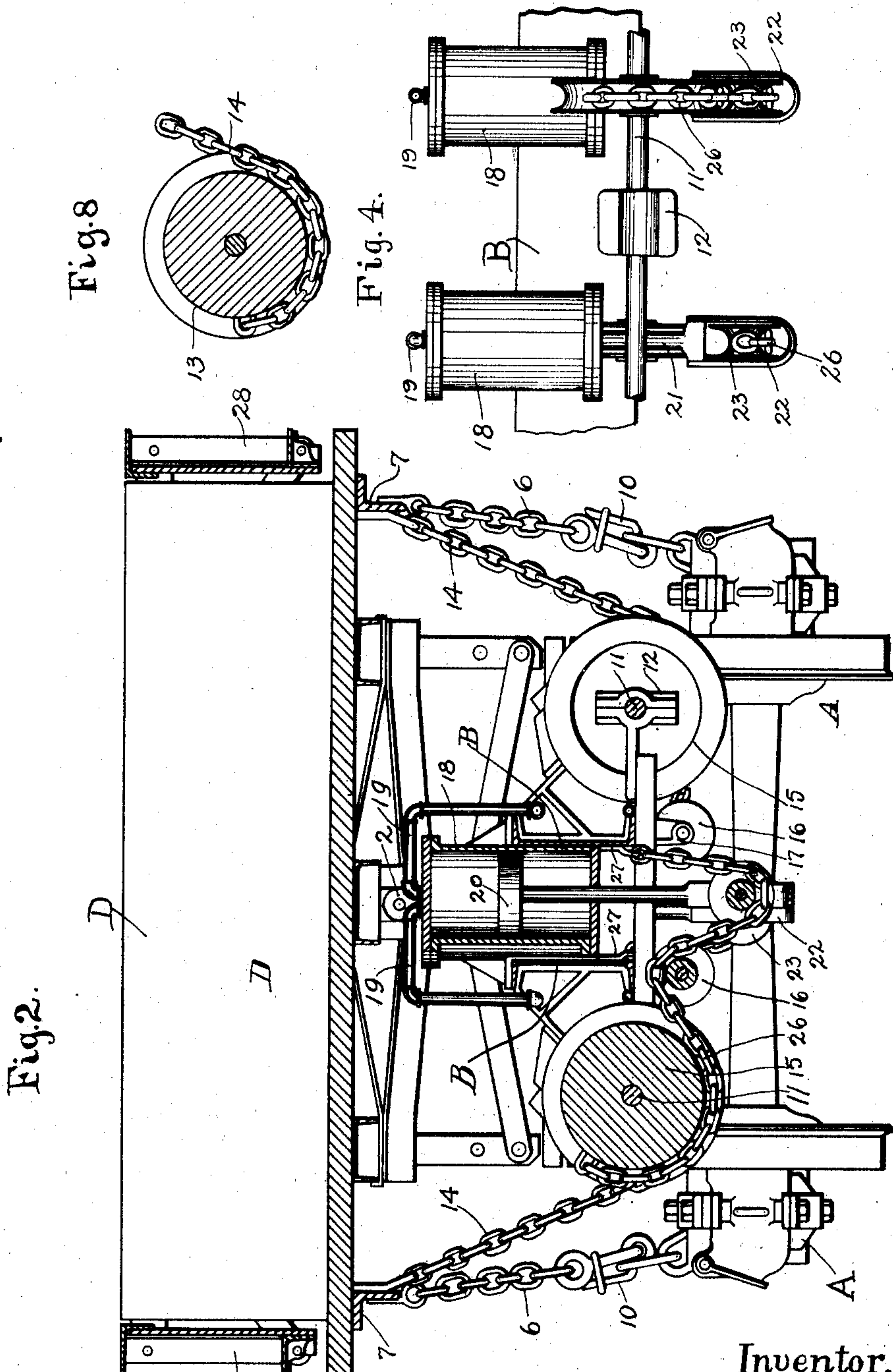


Fig. 2.

Fig. 4.

Fig. 8.

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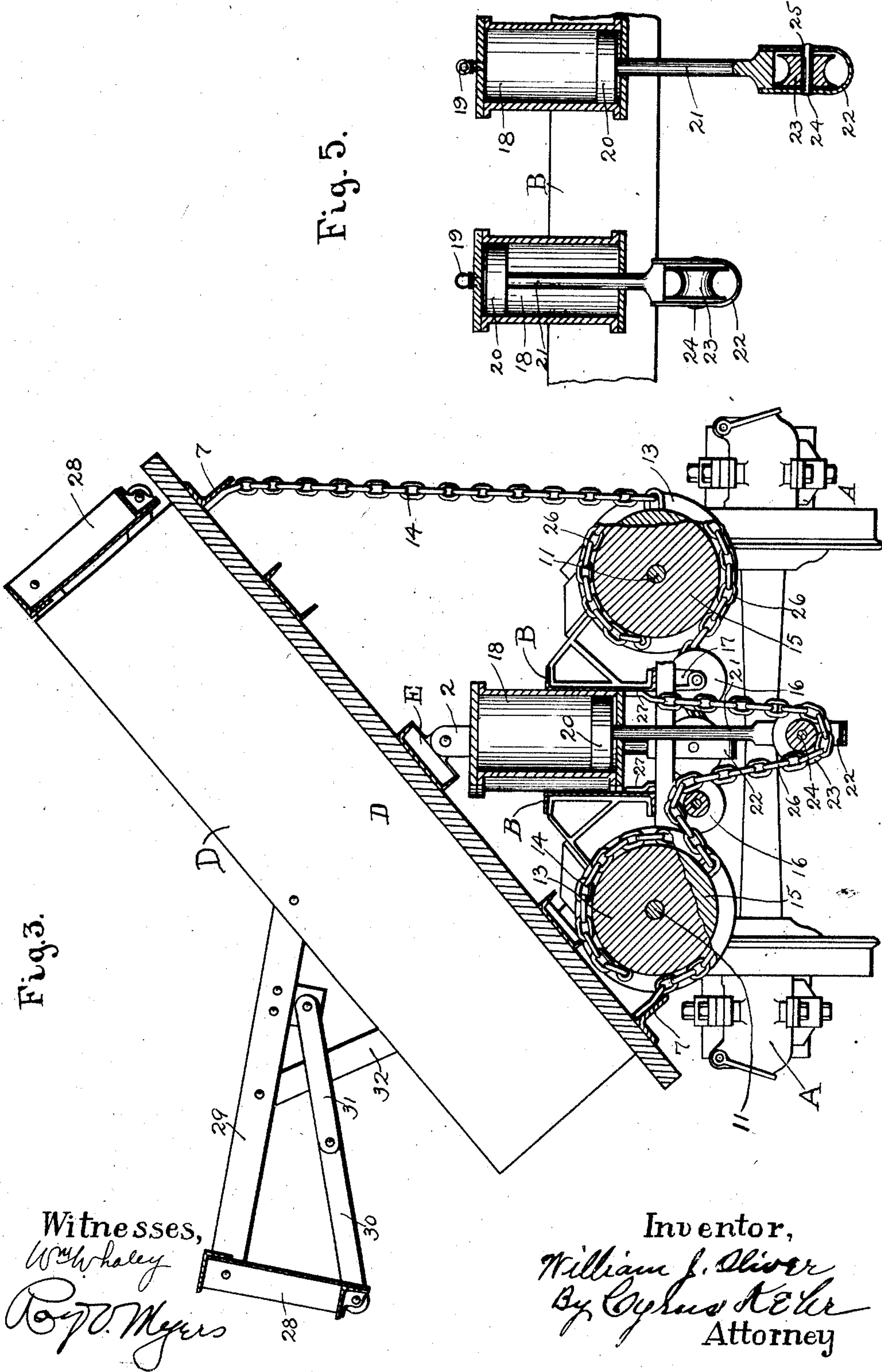
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3 SHEETS—SHEET 3.





# UNITED STATES PATENT OFFICE.

WILLIAM J. OLIVER, OF KNOXVILLE, TENNESSEE.

## DUMP-CAR.

No. 907,277.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed June 17, 1908. Serial No. 439,008.

*To all whom it may concern:*

Be it known that I, WILLIAM J. OLIVER, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Dump-Cars, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to dump cars constructed for the tilting of the car body to either side and comprising mechanism for controlling such movement of the car by means of air or steam power applied through cylinders and pistons.

The object of the improvement is to provide a powerful and efficient and easily controlled mechanism for tilting and righting the bodies of large dump cars used in construction work and for similar purposes. In practice I have applied the improvement to what are known as twenty-yard cars—cars which hold twenty yards of earth, crushed stone, or other material.

In the accompanying drawings, Figure 1 is a side elevation of a little more than one half of a car embodying my improvement, the middle of the car being indicated by the line M—M, and the two halves of the car at each side of said line being identical; Fig. 2 is a section on the line 2—2 of Fig. 1, looking toward the left; Fig. 3 is a section on the same line and looking in the same direction, the car body being tilted for discharging its load; Fig. 4 is a detail elevation taken from the middle of the car to illustrate the two air cylinders, the front frame sill being omitted; Fig. 5 is an upright section through the cylinders parallel to the length of the car; Fig. 6 is a transverse, detail section illustrating the hinge upon which the car body turns; Fig. 7 is a side elevation of the same mechanism; Fig. 8 is a detail sectional view of the right hand pulley of Fig. 2.

Referring to said drawings, A is one of the trucks by which the car is supported, a similar truck being under the opposite end of the car. Upon said trucks rest two longitudinal parallel beams or sills, B, which constitute the chief members of the under-framing. Said sills are horizontally opposite and near each other. Chairs, C, extend across and rest upon said sills and are secured thereto by bolts, 1. Each chair has two upward directed ears, 2, which stand opposite each other in the middle longitudinal, upright

plane of the car. And each ear has an aperture, 3, on an axial line which is horizontal and in said plane.

D is the car body. To the bottom thereof above each chair, C, is secured a hinge member, E, which extends between the ears, 2, and has an aperture, 4, axially in line with the apertures, 3. A pin or bolt, 5, extends through the apertures, 3, of the ears 2, and the apertures, 4, of the hinge member, E. Any desired number of said chairs and hinge members may be used to give the car body proper support. The complete car of the drawings has nine such chairs and members. By means of said chairs and members and said bolts the car body is supported in such manner as to permit tilting to either side or standing in the horizontal position. To normally hold the car body in the horizontal position stay chains, 6, are applied at each side of the car, each chain being attached by its upper end to an angle plate, 7, on the bottom of the car body near the adjacent outer edge of the latter and to a clevis, 8, which is secured to the adjacent side of the truck by a bolt, 9. All of said chains comprise a hook, 10, which permits the separating of the chains at the side of the car body which is to go up when said body is to be tilted.

At each side of the car, and just above the trucks, is a horizontal longitudinal shaft, 11, terminating adjacent each truck and resting in bearings, 12, secured to the under-framing. Near each end of said shaft a grooved pulley, 13, surrounds said shaft and is secured immovably thereto. A chain, 14, is secured by one end in the groove of each such pulley (preferably in the outer portion of the pulley when the car body is in the horizontal position) and by its other end to the adjacent angle plate, 7, at a point above the pulley, the chain being of proper length to be substantially taut when the car body is in the horizontal position. From the foregoing it will be understood that when the shaft, 11, is rotated so as to move the outer portion of said pulleys downward, said chains and the adjacent side of the car will be drawn downward, if the stay chains on the opposite side of the car have been unhooked. The shafts, 11, are rotated by mechanism to be next described. On each of said shafts is a fixed, grooved pulley, 15, one being a little to one side of the upright, transverse, middle plane of the car and the other being a little to the other side of said



plane. Directly opposite each pulley, 15, is an idle pulley, 16, supported in a bracket, 17, extending downward from the adjacent sill, B. In the plane of each pulley, 15, and the adjacent idle pulley, 16, an upright cylinder, 18, is placed with its lower end between and secured to the sills, B. A pipe, 19, leads into the upper head of one of the cylinders, and a similar pipe, 19, leads into the head of the other cylinder. Said pipes are put into communication with a line pipe not shown by the drawings. In said cylinder is a piston, 20, having a rod, 21, extending downward. To the lower end of the piston rod is applied a U-shape strap, 22, having its sides parallel to the plane of the pulleys, 15 and 16, and in which is a grooved pulley, 23, supported loosely on an axle, 24, which is, in turn, fixed in apertures, 25, in the strap, 22. A chain, 26, is secured by one end in the upper portion of the groove of the pulley, 15, (Fig. 2) and passes thence downward over the outer portion of said pulley and over the idle pulley, 16, and thence downward beneath the adjacent pulley, 23, and thence upward to a plate, 27, which is secured to the sill, B, which is the farther from said pulley, 15. The relative arrangement and dimensions of these parts are such as that the chains, 26 and 14, are taut when the pistons, 20, are at the middle of their range of movement and the car body is in the horizontal position, and enough of the chain, 26, is wound upon the pulley, 15, to permit enough rotation of the shaft, 11, for the drawing of the car body downward by the winding of the chains, 14, on the pulleys, 13, while enough of the chains, 14, is wound on the pulleys, 13, to permit the unwinding for the raising of the side of the car body above the level. (See Fig. 8.)

The operation is as follows: Assuming that the car standing as shown in Fig. 2 is to be tilted to the left, the stay chains, 6, at the right hand side of the car are unhooked. Then, by means of the adjacent pipe, 19, air or steam is let into the upper portion of the cylinder whose piston rod bears the pulley, 23, which engages the chain, 26, which is secured to and partially wound around the left hand pulley, 15. At the same time the pipe, 19, leading into the other cylinder is opened to permit the exhaust of air or steam from said cylinder. The air or steam going into the first cylinder drives the piston in said cylinder downward, whereby the adjacent piston rod and pulley, 23, are driven downward, the pulley pressing the adjacent chain, 26, downward, drawing it across the adjacent idle pulley, 16, and unwinding it from the adjacent pulley, 15, (at twice the velocity of the piston rod) whereby said pulley and the shaft, 11, are rotated. And the rotation of the shaft,

11, causes the rotation of the pulleys, 13, upon said shaft, whereby the adjacent chains, 14, are drawn downward and wound upon said pulleys; and thereby the adjacent side of the car body is drawn downward. Simultaneously the opposite side of the car is drawn upward, the chains, 14, at that side being unwound from the adjacent pulleys, 13, whereby the adjacent shaft, 11, and pulley, 15, are rotated in reverse direction and the adjacent chain, 26, wound upon said pulley, 15, and the adjacent pulley, 23, piston rod, 21, and piston, 20, are raised until the piston is in the upper portion of the cylinder.

To return the car to the horizontal position, the pipe, 19, of the first cylinder is opened for exhausting and air or steam is turned into the second cylinder, whereby the piston of said cylinder, and the adjacent piston rod and pulley, 23, are driven downward, whereby the adjacent chain, 26, is driven downward for the rotation of the pulley, 15, the shaft, 11, and the pulleys, 13 (the velocity of the chain in passing from the pulley, 15, being twice the velocity of the piston rod) for the rewinding of the adjacent chains, 14, upon the pulleys, 13, to a sufficient extent to draw the right hand side of the car body downward until said body is again in the horizontal position. Then the stay chains at that side of the car are again hooked. For the tilting of the car body toward the right and its subsequent return to the horizontal position, the above described operation is begun at the left hand side of the car.

At each side of the car body is a door, 28, which is supported and controlled and adapted to be lifted by a lever, 29, and links, 30, 31, and 32, in such manner as to leave said door elevated when the adjacent side of the car body descends (see Fig. 3). As the mechanism for controlling said doors has been heretofore used and is not a part of this invention, I deem it unnecessary to describe the same in detail.

I claim as my invention:

1. In a dump car, the combination with trucks, under-framing, and a car body mounted upon said under-framing for tilting sidewise, of means for normally holding the car body in the horizontal position, shafts parallel to said body and resting in bearings supported by the under-framing, pulleys on said shafts, chains extending from said pulleys to said body, a pulley on each of said shafts, a chain attached by one end to one of said pulleys and having its other end secured to the under-framing, a cylinder, a piston, a piston rod, a pulley supported by said piston rod and bearing upon said chain, another chain attached by one end to the second mentioned pulley on the other of said shafts and having its other end



secured to the under-framing, another cylinder, a piston, piston rod, a pulley supported by said piston rod and bearing upon the last mentioned chain, said parts being  
5 arranged and proportioned for coöperation, and pipes communicating with said cylinders, substantially as described.

2. In a dump car, the combination with trucks, under-framing, and a car body  
10 mounted upon said under-framing for tilting sidewise, of stay chains for normally holding the car body in the horizontal position, shafts parallel to said body and resting in bearings supported by the under-  
15 framing, pulleys on said shafts, chains extending from said pulleys to said body, a pulley on each of said shafts, a chain attached by one end to one of said pulleys and having its other end secured to the under-  
20 framing, a cylinder, a piston, a piston rod, a pulley supported by said piston rod and bearing upon said chain, another chain attached by one end to the second mentioned pulley on the other of said shafts and having  
25 its other end secured to the under-framing, another cylinder, a piston, piston rod, a pulley supported by said piston rod and bearing upon the last mentioned chain, said parts being arranged and proportioned for coöpera-  
30 tion, and pipes communicating with said cylinders, substantially as described.

3. In a dump car, the combination with trucks, under-framing, and a car body  
35 mounted upon said under-framing for tilting sidewise, of means for normally holding the car body in the horizontal position, shafts parallel to said body and resting in bearings supported by the under-framing, pulleys on said shafts, chains extending  
40 from said pulleys to said body, a pulley on each of said shafts, an idly pulley adjacent each such pulley, a chain attached by one end to one of said pulleys and extending over the adjacent idle pulley and having  
45 its other end secured to the under-framing, a cylinder, a piston, a piston rod, a pulley supported by said piston rod and bearing upon said chain, another chain attached by one end to the second mentioned pulley on  
50 the other of said shafts and extending over the adjacent idle pulley and having its other end secured to the under-framing, another cylinder, a piston, piston rod, a pulley supported by said piston rod and bearing upon  
55 the last mentioned chain, said parts being arranged and proportioned for coöperation, and pipes communicating with said cylinders, substantially as described.

4. In a dump car, the combination with  
60 trucks, under-framing, and a car body mounted upon said under-framing for tilting sidewise, of means for normally holding the car body in the horizontal position, shafts parallel to said body and resting in  
65 bearings supported by the under-framing,

pulleys on said shafts, chains extending from said pulleys to said body, a pulley on each of said shafts, a chain attached by one end to one of said pulleys and having its other end secured to the under-framing, a cylinder  
70 set in the longitudinal central upright plane of the car, a piston, a piston rod, a pulley supported by said piston rod and bearing upon said chain, another chain attached by one end to the second mentioned pulley on  
75 the other of said shafts and having its other end secured to the under-framing, another cylinder set in the longitudinal central upright plane of the car, a piston, piston rod, a pulley supported by said piston rod and  
80 bearing upon the last mentioned chain, said parts being arranged and proportioned for coöperation, and pipes communicating with said cylinders, substantially as described.

5. In a dump car, the combination with  
85 trucks, under-framing, and a car body mounted upon said under-framing for tilting sidewise, of means for normally holding the car body in the horizontal position, shafts parallel to said body and resting in  
90 bearings supported by the under-framing, pulleys on said shafts, chains extending from said pulleys to said body, a pulley on each of said shafts, a chain attached by one end to one of said pulleys and having its other  
95 end secured to the under-framing, a cylinder, a piston, a downward-directed piston rod, a pulley supported by said piston rod and bearing upon said chain, another chain attached by one end to the second mentioned  
100 pulley on the other of said shafts and having its other end secured to the under-framing, another cylinder, a piston, a downward-directed piston rod, a pulley supported by said piston rod and bearing upon the last  
105 mentioned chain, said parts being arranged and proportioned for coöperation, and pipes communicating with said cylinders, substantially as described.

6. In a dump car, the combination with  
110 trucks, under-framing comprising two longitudinal parallel and horizontally-opposite sills, and a car body mounted upon said under-framing for tilting sidewise, of means for normally holding the car body in the  
115 horizontal position, shafts parallel to said body and resting in bearings supported by the under-framing, pulleys on said shafts, chains extending from said pulleys to said body, a pulley on each of said shafts, a chain  
120 attached by one end to one of said pulleys and having its other end secured to the under-framing, a cylinder located between said sills, a piston, a piston rod, a pulley supported by said piston rod and bearing  
125 upon said chain, another chain attached by one end to the second mentioned pulley on the other of said shafts and having its other end secured to the under-framing, another cylinder located between said sills, a piston,  
130



a piston rod, a pulley supported by said piston rod and bearing upon the last-mentioned chain, said parts being arranged and proportioned for coöperation, and pipes communicating with said cylinders, substantially as described.

7. In a dump car, the combination with trucks, under-framing comprising two longitudinal parallel and horizontally-opposite sills, and a car body mounted upon said under-framing for tilting sidewise, of means for normally holding the car body in the horizontal position, shafts parallel to said body and resting in bearings supported by the under-framing, pulleys on said shafts, chains extending from said pulleys to said body, a pulley on each of said shafts, a chain attached by one end to one of said pulleys and having its other end secured to one of said sills, a cylinder, a piston, a piston rod,

a pulley supported by said piston rod and bearing upon said chain, another chain attached by one end to the second mentioned pulley on the other of said shafts and having its other end secured to the other of said sills, another cylinder, a piston, piston rod, a pulley supported by said piston rod and bearing upon the last-mentioned chain, said parts being arranged and proportioned for coöperation, and pipes communicating with said cylinders, substantially as described.

In testimony whereof I have signed my name, in presence of two witnesses, this fifteenth day of June, in the year one thousand nine hundred and eight.

WILLIAM J. OLIVER.

Witnesses:

J. L. BOWLES, Jr.

H. L. PIKE.