

No. 820,024.

PATENTED MAY 8, 1906.

T. H. STAGG.
DUMPING CAR.

APPLICATION FILED JAN. 3, 1906.

2 SHEETS—SHEET 1.

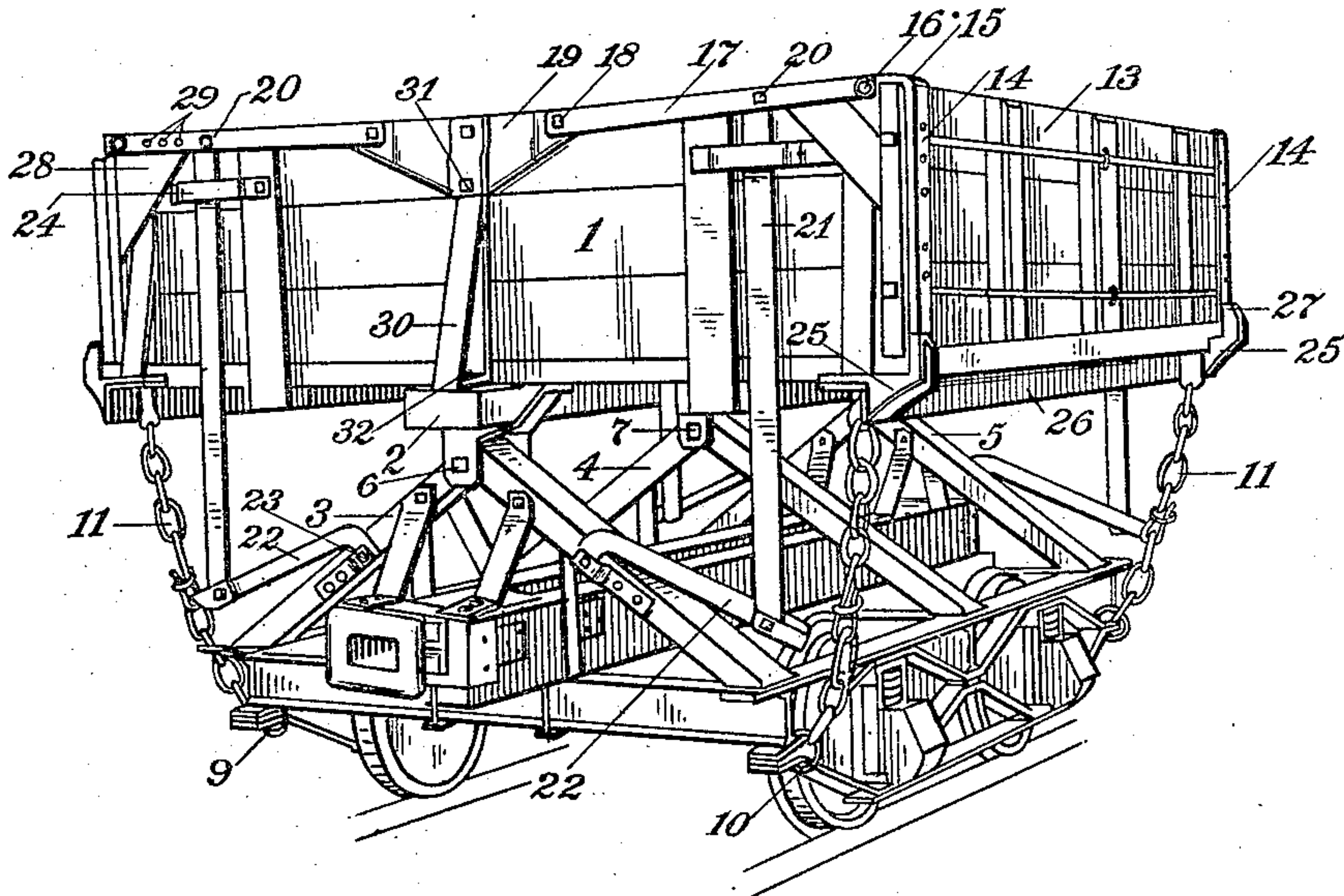


Fig. 1

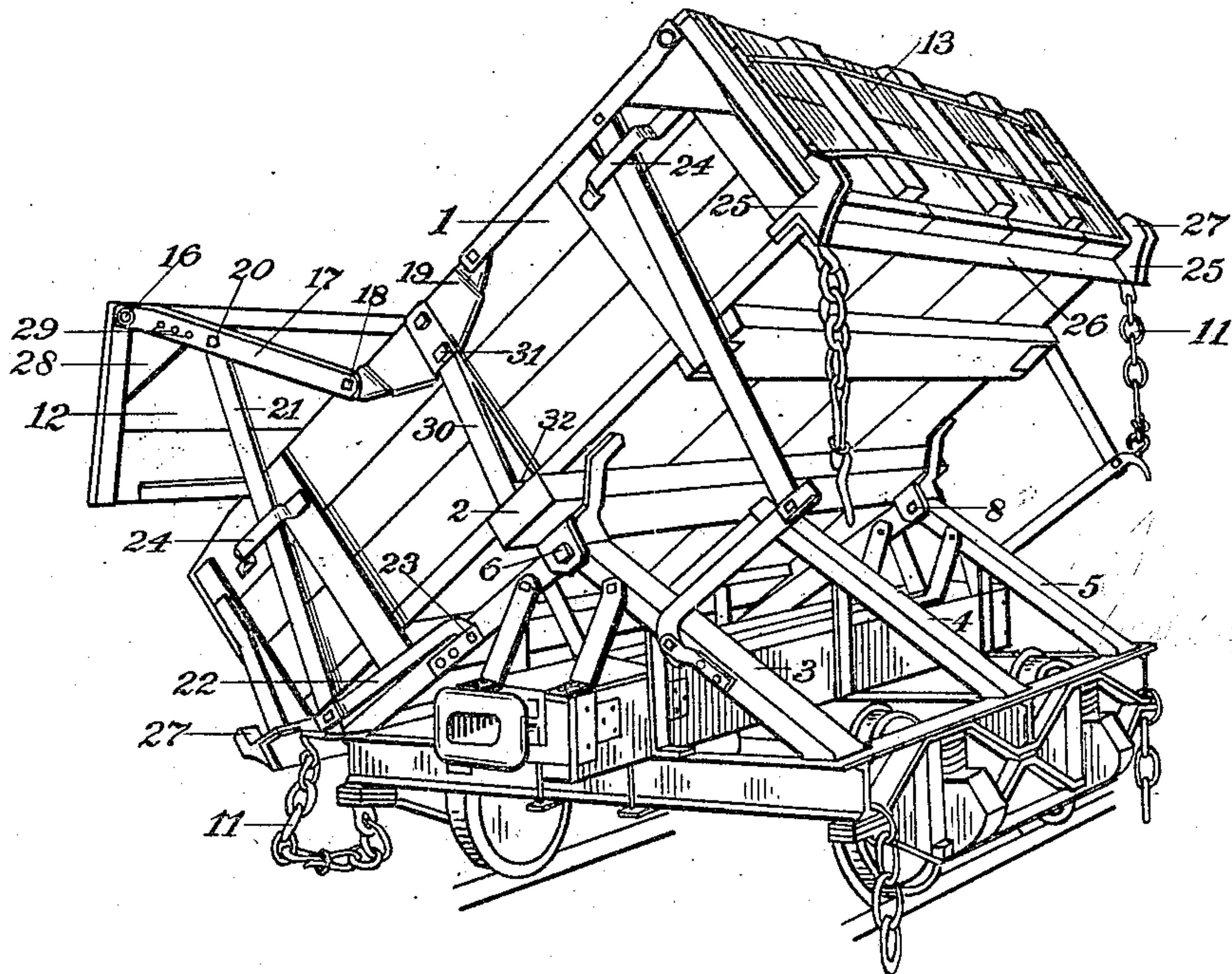


Fig. 2

WITNESSES:

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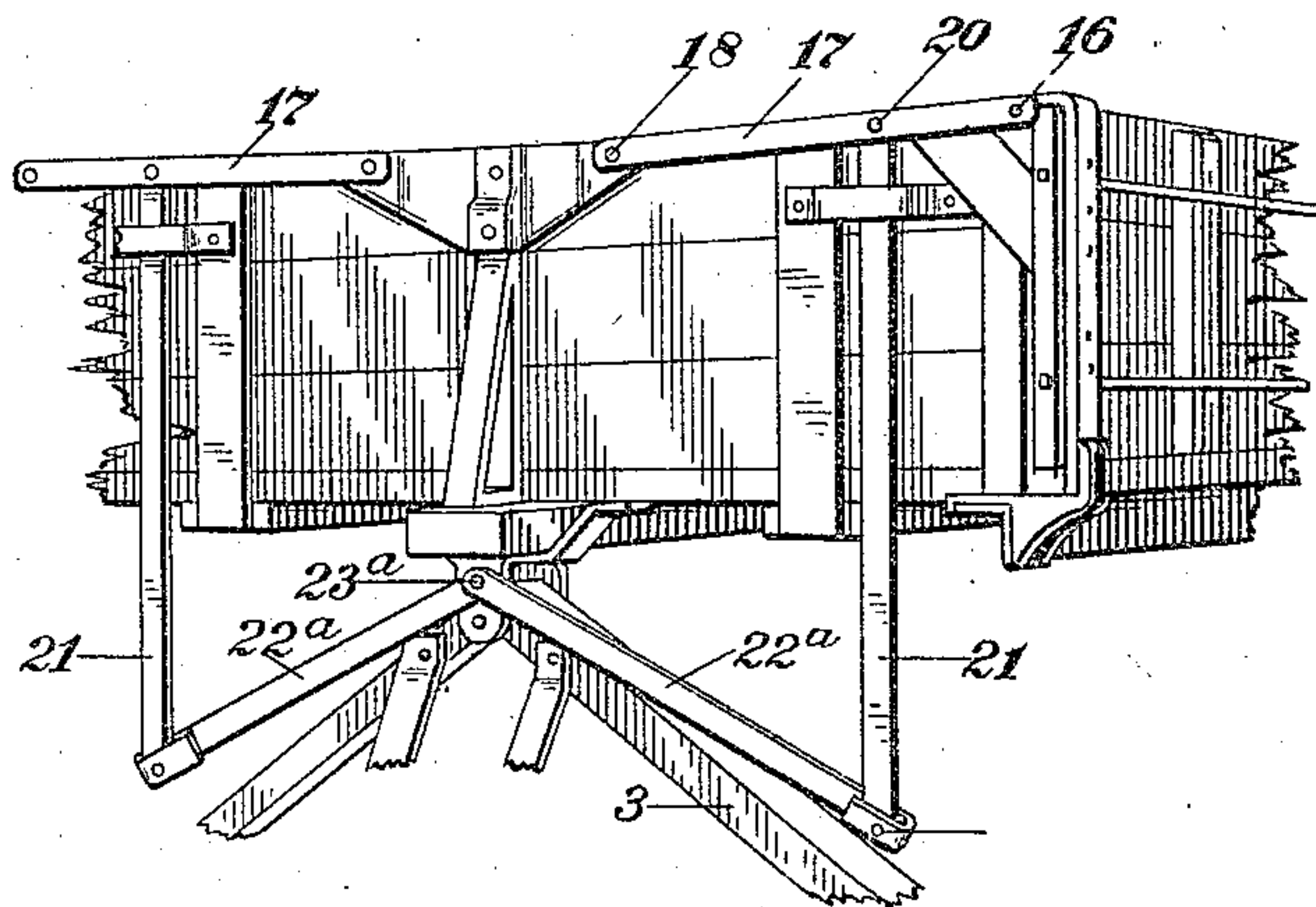


Fig. 3

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UNITED STATES PATENT OFFICE.

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DUMPING-CAR.

No. 820,024.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed January 3, 1906. Serial No. 294,370.

To all whom it may concern:

Be it known that I, THOMAS H. STAGG, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Dumping-Cars, of which the following is a specification.

My invention relates to a dumping-car, especially to a car which is pivoted and adapted to dump at one or both sides.

It comprises improvements in the means for operating the swinging side doors, in rendering their locking and unlocking positive, and in supporting the mechanism which controls the operation of the swinging door upon the truck or bed.

It also consists in providing an improved bracing construction for the ends of the car whereby the strain necessarily incident to the manipulation of the heavy swinging side door is removed from the wooden structure and borne entirely by a metal bracing construction.

It also consists in pivoting the swinging doors at one side of the top thereof, so that the weight of the door maintains it normally in contact with my improved device for insuring the locking thereof.

It consists, further, in the construction and arrangement of parts hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a perspective view of the end and one side of my improved dumping-car. Fig. 2 shows the car in dumping position, illustrating the operation of the swinging side door, (1.) Fig. 3 shows a modification of the bracing construction.

Referring to the drawings, in which the same characters of reference indicate like parts throughout, 1 is the body of the car, mounted longitudinally upon the central sill 2, which is pivoted to swing vertically in the arc of a circle upon the arch-braces 3, 4, and 5 at the points 6 7 8. Secured to the truck, at the corners thereof, as shown at 9 and 10, are chains 11, which at their upper ends are secured to the bed of the car. When in normal position, the car is prevented from dumping by the chain connection between the bed and the truck; but when it is desired to dump the car the chains on one side thereof are released, as appears in Fig. 2, permitting the car to be dumped toward the opposite

side. The truck construction of the car need not be described further.

The car-bed is provided with swinging doors 12 and 13, which constitute the sides thereof. The car may be so constructed as to dump only at one side, in which case of course it will be necessary to provide only one swinging door. The door is provided at each end with a strap-hinge 14, strongly secured thereto and passing over the top and being bent toward the body of the car, as shown at 15, and formed so as to be pivoted, as appears at 16, to the flat metal bar pivoted at 18 to the stamped-steel plate 19. Between the ends of the flat bar 17 there is pivoted at 20 the vertical bar 21, which at its lower end is pivotally attached to the outer end of the strap 22, which at its inner end is bent downwardly and pivoted at 23 to the arch-brace 3. This shape of the strap 22 permits of greater freedom of action, and, as shown in Fig. 2, when the car is dumped the strap on the lower side is depressed parallel with the sides of the arch-brace, whereas the strap on the other side is elevated, so as to form a right angle approximately with the other side of the arch-brace. The strap at its outer end is turned back upon itself, thereby forming a closed end through which the upright bar passes and is pivoted. This construction provides greater strength and greater freedom of action than would otherwise be obtained. To the end of the car-bed is attached a cleat or guide 24 to limit the lateral movement of the upright bar 21 as the car-bed is dumped or made to resume its normal position. This action is clearly illustrated in Fig. 2.

The advantages of a swinging door forming the side of the car are many, the chief one being that as soon as it is released the free end may swing outwardly, and the material sliding outwardly from the car is free to move in a mass for the reason that it carries the door with it. Therefore frozen material and material in very large lumps easily escapes from the car, and ordinarily all the material would be dumped by the time the car reached its maximum inclination, whereas if the sides were raised rigidly the larger material would not only not pass readily, but would also block the way of the finer material.

Although the advantages of a swinging side door have been recognized and utilized,

yet difficulty has been experienced in providing a door which would automatically lock and unlock at the proper moment and which would be positive in these operations. Not
 5 so much difficulty has been experienced with unlocking properly as with the positive locking automatically. My invention provides a swinging door which will never fail to unlock or to lock automatically upon the proper
 10 operation of the car in dumping or returning the same to normal position. A plurality of locks 25 may be provided, secured to the angle-iron 26, which extends beneath the car-bed, as shown in Fig. 2. I have shown
 15 only two locks on each side; but it is clear that a single lock near the middle of the side might be provided, or more than two might be used. The lock is made to extend beyond the outer edge of the car-bed and is provided with the upwardly-curved finger 27,
 20 between which and the end of the car the swinging door is securely held when the car is in normal position. When the car is in dumping position, the door on the elevated
 25 side of the car remains locked.

The chief difficulty has been experienced in providing a construction which would cause the door to lock positively when returned to normal position, and to accomplish this I pivot the door at the top thereof
 30 and upon the inner side, so that the lower side of the door under the influence of gravity will constantly tend to swing inwardly. To limit this inward motion, I provide means
 35 interposed between the horizontal bar and the door which prevents the door from swinging inwardly beyond a predetermined point. The door when open should be at a right angle with the horizontal bar, and I accomplish this by providing, preferably, the gusset-plate 28, which is secured at 29 to the bar
 40 17. As appears clearly in Fig. 2, when the car is in the dumping position the door bears against the gusset-plate and is held outwardly thereby at an angle of about twelve
 45 degrees from a perpendicular. When the car is being returned to its normal position, the coaction of the car-bed and the bracing construction supporting the door is such
 50 that the door assumes a perpendicular position just as its lower end passes the extremities of the fingers 27 on the locks 25, and so falls into its locking position. In cars not
 55 provided with the gusset-plate the lower side of the door when in open position is vertically above the ends of the car and is very likely to strike thereon when it is attempted to right the car, and thereby prevent the operation until the door is seized and swung out-
 60 wardly and maintained in that position while the car is righted. Where the car is large, the door must be very heavy to fulfil the functions of a side of the car and great force would be required to swing it out-
 65 wardly to permit the car to be righted, which

would necessitate the employment of additional workmen. Not only is the operation of the car frequently delayed and made more difficult where the gusset-plate is not used, but the sides and ends of the car are frequently damaged and the locks are broken,
 70 and in other ways the manipulation of the car is seriously interfered with.

The car as a rule is more heavily loaded upon the side through which it is to be
 75 dumped. When the proper place is reached, the chains on the opposite side are released, and the car is automatically dumped. Suppose the side indicated as A be the dumping
 80 side desired. When the chains are released, the car automatically tilts, and the side door 13, through the operation of its supporting construction above described, is slightly
 85 lifted and maintained in its elevated position, as shown in Fig. 2. It is also inclined outwardly at its lower side away from the car-bed and is held in that position by the gusset-plate. The door in this position exerts a
 90 greater stress downward upon the horizontal bar 17 than it would if the gusset-plate were not provided, and through the pivotal connection 18 it exerts a lifting influence upon
 95 the car-bed, whereby the same is returned to its normal position automatically. I therefore accomplish two very important results by the use of the gusset-plate, namely:
 100 First, the door in its open position is made to assume an outwardly-inclined position, whereby the stress tending to right the car is materially increased, and whereby the car
 105 is automatically righted, and, second, the door when the car is returning to its normal position under the influence of gravity alone engages the gusset-plate and is so guided
 110 thereby as to be absolutely prevented from striking the car parts and is surely returned to proper position to be locked to the car-bed. The advantages of having a car to operate automatically both in dumping and in
 115 righting and in which the operation of the door is automatic and free from the objectionable features above pointed out and in which the locking is positive and certain are very great, and my means for producing such results constitutes a distinct advance in the
 120 dumping-car art.

In dump-cars that have side doors there is great stress upon the wooden structure of the end of the car, so that in time the end becomes much weakened by the splitting of the
 125 wooden structure and by the consequent loosening of the supports for the doors. I avoid this injurious effect upon the wooden structure of the ends by the metallic construction in which the plate 19 is secured at
 130 the middle of the upper side of the end of the car. At either side of this plate there is pivotally attached the metal bars 17, to the outer extremity of which the door is hinged or pivoted. When the door is in its normal closed
 135

position, there is very little lateral stress upon the end of the car until the car is loaded, whereupon the outward pressure against the door due to the load is maintained by the lock at the lower side and by the bar to which the door is pivoted upon the upper side. This stress upon the upper side is transmitted through the bar 17 and the plate 19 to the corresponding bar on the other side and to the door through the pivotal connection. I therefore provide for the transmission of the outward stress upon the doors across the intervening metallic structure, so that the stress is sustained in the same manner as if the doors were connected at the tops thereof by a rigid metallic structure, thereby relieving the wooden structure of the end of the car from all stress. When the car is dumped and the door is held in the elevated position, it is seen that a severe stress is placed upon the bar 17 and through it upon the plate 19, the stress being not only lateral, but also vertical. The plate 19 could sustain the lateral stress without transmitting any strain to the wooden structure; but if this plate were secured only to the wooden structure then the injurious effect of the vertical stress would ultimately be sustained thereby, to the consequent injury of said wooden structure. To avoid this objection, I provide the triangular bracing construction shown at 30, which is attached upon its upper end to the stamped steel plate 19, as shown at 31, and at its lower end at 32 to the sill 2 by a bolt passing there-through. It is clear that the vertical stress would be transmitted through the plate and the bracing construction and ultimately be sustained by the heavy sill passing beneath the car. The downward stress exerted by the weight of the door when the car is in its dumping position is transmitted through the medium of the bar 21 and the strap 22 to the metallic bracing-arch, as clearly appears in Fig. 2.

It is apparent from the foregoing description and the drawings that I provide a bracing construction for the ends of the car, whereby the wooden structure thereof is entirely relieved from the lateral and vertical strains due to the operation of the car, and the whole stress is sustained by a metallic construction so united that the stress ultimately falls upon the foundation parts thereof. Consequently my construction provides a more durable car, one less subject to injuries and breaks, and consequently one which will less often need inspection and repair, all of which are extremely desirable features in car construction. It is also apparent that by means of my construction I provide a door which is automatically unlocked, which is pivoted to swing outwardly, and thereby give egress to the load in a mass, which is securely held in an open position when the car is dumped, and which by gravity is held in en-

gagement with the gusset-plate in the proper position to lock positively whenever the car is returned to its normal position. Further, on account of the use of the metallic arch-braces and the pivoting of the car-bed centrally along its bottom thereto, and the provision for controlling the operation of the doors, a car is produced which is automatic in its operation of dumping and resuming its normal position.

Modifications may be made in the construction herein shown and described, and I desire to claim all such as are within the spirit of my invention. For instance, the strap 22 may be pivoted to the central sill 2 or the plate through which said sill is pivoted upon the arch-brace, as appears in Fig. 3, and produce the same results as by pivoting it to the arch-brace. Other changes of arrangement may obviously be made also. However, by such experiment it has been determined that approximately the arrangement of parts shown in the drawings will produce the best results.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a side-dumping car a side door pivotally suspended to swing freely and to tend to swing inwardly, means for maintaining said door in elevated position when the car is dumped, in combination with a member positioned between said door and said means, which member is adapted to prevent the inward swing of said door beyond a predetermined point, said door engaging with said member by gravity alone and being free to swing outwardly.

2. In a side-dumping car, a laterally-extending bar, a door pivoted at its outer side to said bar, a plate interposed between said bar and said door to limit the inward swing of said door, said door being adapted to engage against said plate through gravity alone and being free to swing outwardly, in combination with means to maintain said door in an elevated position when said car is dumped.

3. In a side-dumping car a side door, a substantially horizontal bar mounted pivotally from which said door is pivotally suspended and arranged to tend to swing inwardly, means adapted to maintain the door in elevated position when the car is dumped, a rigid lock for said door on the bottom of the bed of said car, a member secured to said horizontal bar against which said door engages by gravity alone, whereby said door is left free to swing outwardly but is so held against inward movement by said member as to be automatically returned into locking engagement with said locking member when the car is righted.

4. In a side-dumping car, a bracing construction at the end thereof comprising a vertical bar pivoted thereto, a horizontal bar pivoted to the car-bed and pivotally at-

5 tached to said vertical bar, a side door pivotally suspended from the outer end of said horizontal bar and adapted to swing freely thereon, a rigid locking member on the bottom of said car-bed, a member carried by said horizontal bar with which said door engages through gravity; whereby said door is caused to fall into locking engagement with-

said locking member when the car-bed is returned to its normal position.

In testimony whereof I affix my signature in the presence of two witnesses.

THOMAS H. STAGG.

Witnesses:

FRED W. HUBBARD,
GEO. W. RIGHTMIRE.