

A. CAMPBELL.
DOOR OPERATING MECHANISM FOR DUMP CARS.

APPLICATION FILED JAN. 5, 1912.

1,056,883.

Patented Mar. 25, 1913.

3 SHEETS—SHEET 1.

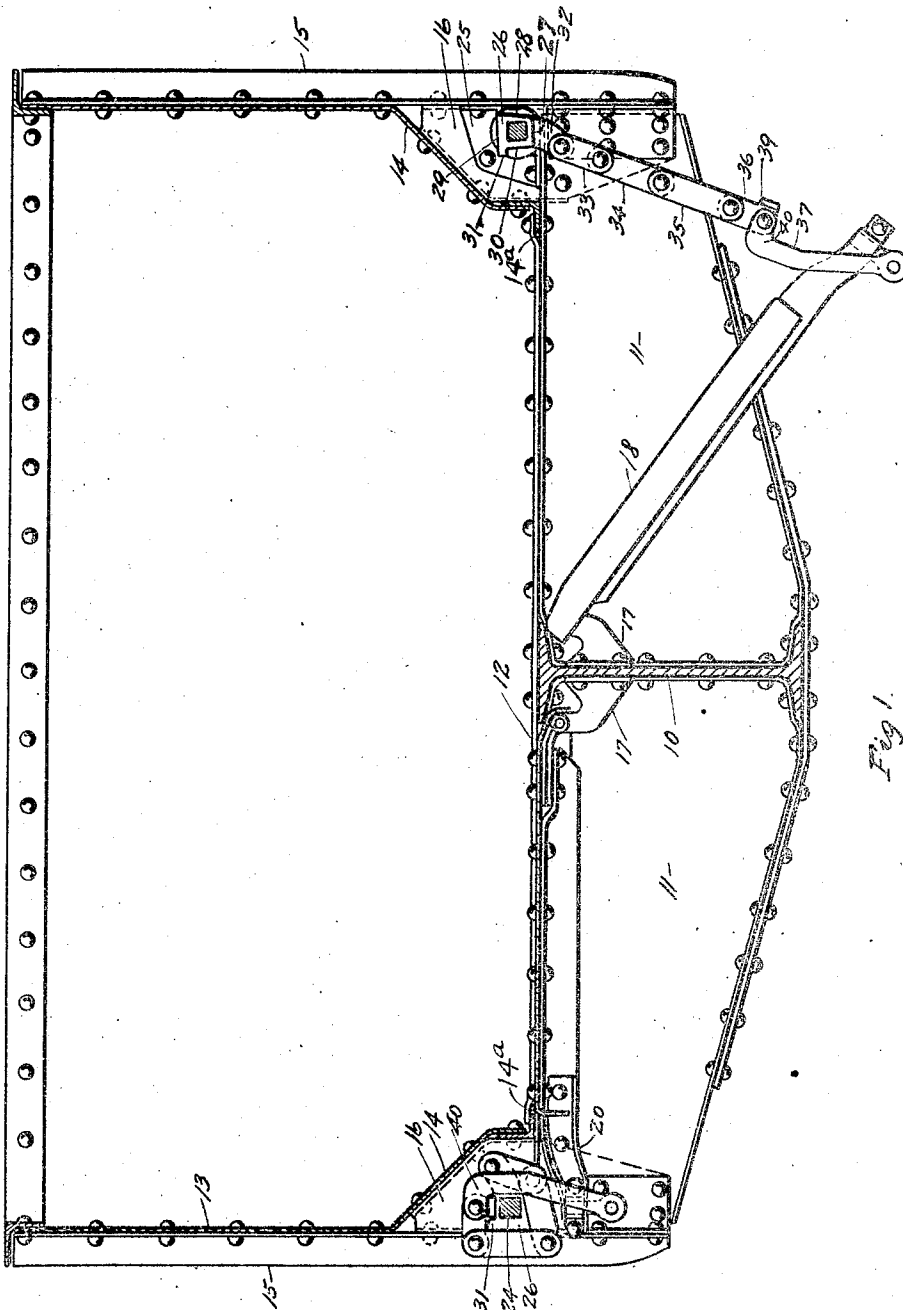


Fig. 1.

WITNESSES:

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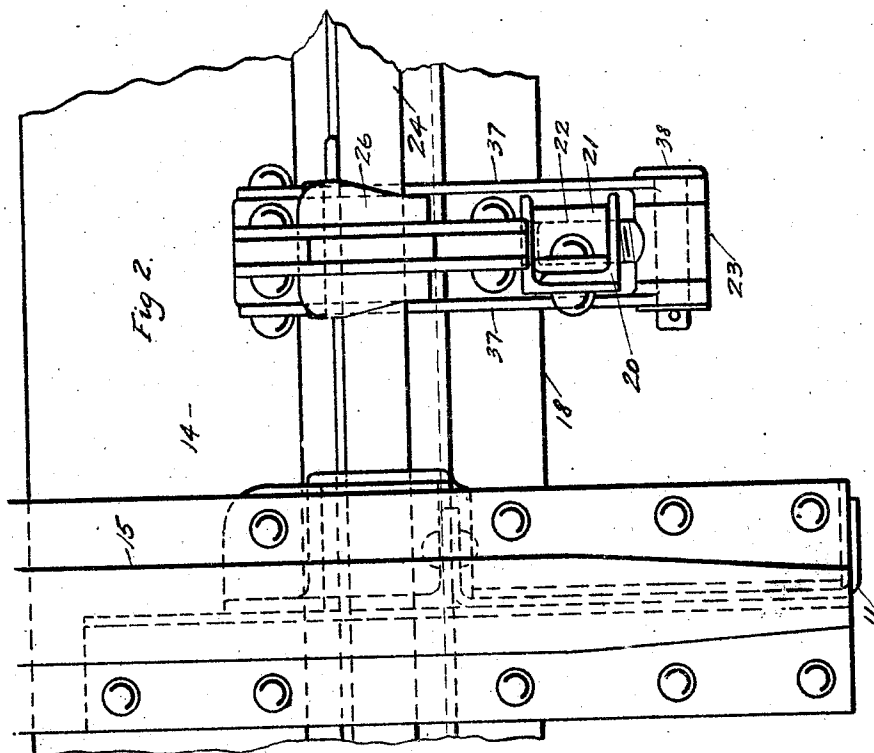
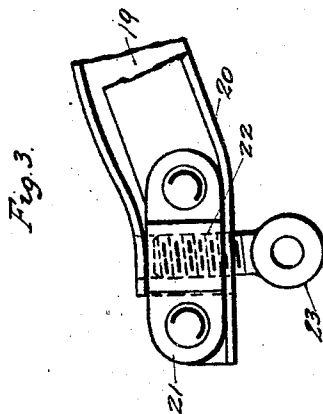
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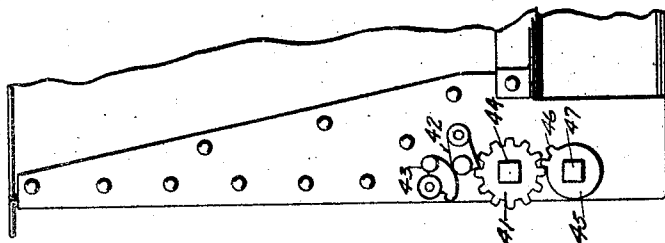


Fig. 5.

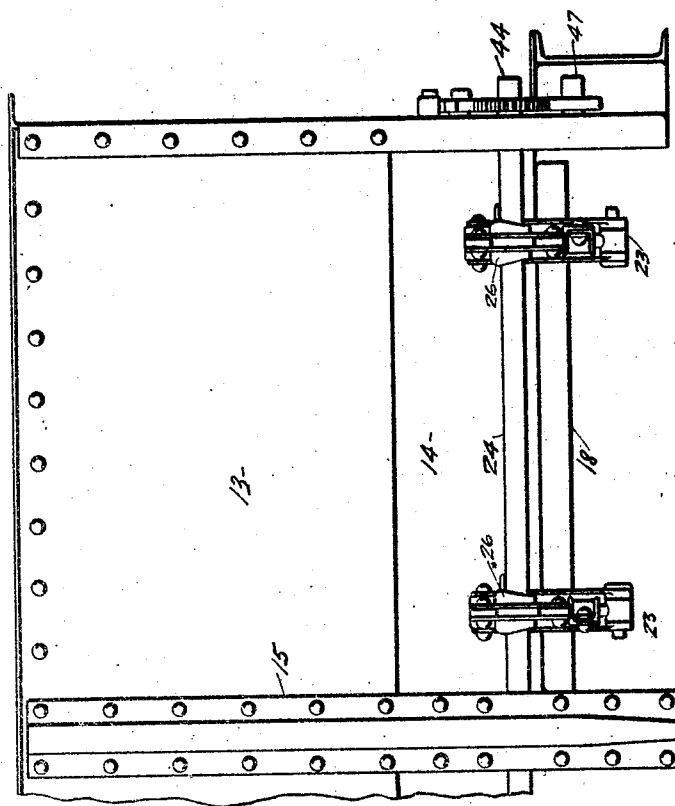


Fig. 4.

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UNITED STATES PATENT OFFICE.

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DOOR-OPERATING MECHANISM FOR DUMP-CARS.

1,056,883.

Specification of Letters Patent.

Patented Mar. 25, 1913.

Application filed January 5, 1912. Serial No. 669,684.

To all whom it may concern:

Be it known that I, ARGYLE CAMPBELL, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Door-Operating Mechanism for Dump-Cars, of which the following is a specification.

This invention relates to improvements in door operating mechanism for dump or drop bottom cars.

The object of the invention is to provide a simple and efficient mechanism whereby the doors may be opened and closed with comparative ease, and adjustable means whereby the doors may always be tightly and accurately closed, a structure whereby the doors are safely and securely and automatically locked when in closed position, and means for unlocking the operating shaft and connections therewith and giving the same an initial, rotary movement to start the unwinding of the flexible connection between the shaft and door to release the automatic lock.

One form of the invention comprises in combination with a car body having hinged drop bottom doors, a shaft mounted in bearing plates which also serve as bracing members for portions of the car body, a flexible link chain or connection between the outer or free end of the drop bottom door and a drum on the shaft; an adjustable eye-bolt connection between a link of the chain and the door, means for rotating the shaft, locking means for preventing accidental rotation of the shaft comprising a ratchet wheel and latch, and a segmental or stripped gear adapted to engage the ratchet wheel and partially rotate the same.

The invention furthermore consists in the improvements in the parts and devices and in the novel combinations of parts and devices herein shown, described and claimed.

In the drawing forming a part of this specification, Figure 1 is a transverse, vertical section of a car embodying my improvements, showing one of the hinged doors in its closed position and another in its open position. Fig. 2 is a partial, side elevation, upon an enlarged scale, showing a portion of the operating mechanism when the door is in its closed or locked position. Fig. 3 is a detail view, upon an enlarged scale, showing the adjustable eye-bolt mounted in

an extension of the car door. Fig. 4 is a side elevation of a portion of a car at one end thereof, and showing the locking mechanism for the operating shaft, and Fig. 5 is a partial end elevation of the car, showing the means for locking the operating shaft and the segmental gear connected therewith.

In the drawing 10 denotes the center sill of the car, the same being formed from an I beam, 11, 11, the transverse diaphragms or needle beams, 12, the bottom plates of the car, 13, the vertically extending sides thereof each having at their lower ends a diagonally disposed portion 14, the latter being secured along its lower edge to one leg of a longitudinally extending angle iron 14^a, the other leg of which is secured to the top flanges of the diaphragms or needle beams 11. The usual side stakes 15 are provided and are secured to the vertical portions of the sides 13 and to the outer ends of the transverse members of the car underframe, and disposed between the side stakes and the diagonally disposed portions 14 of the car sides are bracing plates 15 which are also secured to the diaphragms 11 below the floor level of the car.

Hinged at their inner ends to brackets 17 are drop bottom doors 18, each of said doors being provided with a plurality of extensions 19, each of said extensions being in the form of an angle iron, and having secured thereto another angle iron 20 and a member 21, each of said members 21 being provided with a threaded hole 22, in which is adjustably mounted a threaded eye-bolt 23. A longitudinally extending operating shaft 24 is provided on each side of the car for opening and closing the drop bottom doors 18, and as will be noted, each of these shafts is disposed within a vertical plane passing through the vertical sides of the car and above the floor level and within the space provided between the tops of the diaphragms, the side stakes, and the diagonally disposed portions 14 of the sides, thus eliminating all undesirable projecting members on the sides of the car. These shafts 24 are mounted in journal bearings formed in castings 25, and as will be noted, each of these castings 25 is secured to a side stake 15, brace plate 16, and the top flange of the transverse diaphragm, thereby serving, in combination with the brace

plates 16, to support the stakes at their weakest points, namely, at the floor level, about which points the load of the car has a tendency to bend the stakes outwardly.

5 Mounted on each of the operating shafts 24 are a plurality of drums 26, each having a plurality of faces 27, 28, 29 and 30, the latter face being provided with a projection 31 for a purpose hereinafter described. Each drum is furthermore provided with an integral lug 32. Extending between the lug 32 and the eye-bolt 23 is a flexible connection comprised of a plurality of links 33, 34, 35, 36 and 37, the link 33 being pivotally connected with the lug 32, and the link 37 pivotally connected to the eye-bolt 23, the latter pivotal connection being formed by a removable pin 38. When the flexible connection is wound upon the drum, the links 34, 35, and 36 are adapted to engage respectively, the faces 28, 29 and 30. Each of the links 36 is provided with a projection 39, adapted to cooperate with a notch 31 on the face 30 of the winding drum. Each of the links 37 is in the form of a hook having a right angle portion 40, which, when the flexible connection is wound upon the drum, is disposed above the operating shaft and has its pivotal connection with the adjacent link vertically disposed over the operating shaft. The adjustable eye-bolt 23, when the door is in its closed position, extends vertically and is located directly beneath the operating shaft, so that the pivotal connection between the eye-bolt and the link 37 is located directly beneath the shaft and in line with the pivotal connection at the opposite end of said link, whereby the links of the chain and the drum on the operating shaft form an automatic locking means to retain the door in its closed position. By providing the adjustable eye-bolt 23 for connecting the flexible connection to the door, I am enabled to compensate for any wear between the parts, or any sagging of the door in use, and thus provide a means whereby the door may always be securely closed. Each of the operating shafts 24 is provided at one end with a ratchet wheel 41 keyed thereto, whereby the operating shaft may be prevented from accidental rotation by means of a pivoted latch 42 and adapted to be locked by a cam lever 43. At the end of each shaft there is also provided a squared end 44, whereby the same may be rotated by a crank and the door closed.

Hitherto in constructions employing an operating shaft and a flexible connection between the hinged doors, when the shaft has been rotated to unwind the chain or flexible connection with the load being supported by the door, considerable danger has been experienced, due to the tendency of the shaft to rotate swiftly and to carry the

crank therewith. To obviate this danger, I provide a segmental or stripped gear 45, pivoted adjacent the ratchet wheel 41, and having a plurality of teeth 46 adapted to engage the teeth of the ratchet wheel 41, said segmental gear 45 being furthermore provided with a squared end 47, whereby the same may be rotated by means of a crank or other suitable device. To release or open the hinged door, the segmental gear 45 is rotated, whereby the teeth 46 engage the teeth of the ratchet wheel 41 and give said ratchet wheel a partial rotation sufficient to loosen the automatic lock between the shaft, flexible connection and door, and, as will be apparent, upon a continued rotation of the segmental gear 45, the teeth thereof will disengage from the teeth of the ratchet wheel, whereby the operating shaft is free to rotate without danger of injuring the operator, since the crank will be engaged on the squared end 47 and not on the squared end 44 on the operating shaft.

I have described one form of a car embodying my inventions, but I wish it to be understood that the same is merely illustrative, and that all changes and modifications are contemplated as fall within the scope of the appended claims.

I claim:—

1. In a dump car having hinged, drop bottom doors, a body having sides provided with inwardly sloping lower portions, side stakes, transversely extending underframe members, and having said stakes secured thereto, bracing plates secured to and between said sloping lower side portions, the stakes and the transverse underframe members, shaft bearings secured to the bracing plates and the side stakes and an operating shaft journaled in said bearings and disposed above the floor level and within the vertical plane of the sides.

2. In a dump car, in combination, a car body, a hinged drop bottom door, an operating shaft and a flexible connection between said shaft and the free end of the door, said shaft having a ratchet wheel at one end thereof, a locking latch for said wheel, and a segmental gear adapted to engage a portion of the teeth of the ratchet wheel to start the rotation thereof.

3. In a dump car, in combination, a car body, a hinged drop bottom door, an operating shaft having a drum thereon, a flexible connection between said shaft and the free end of the door, said flexible connection comprising a plurality of links so arranged that when they are wound upon the drum, the door is automatically locked in its closed position, a ratchet wheel secured to one end of the shaft, means for locking said ratchet wheel from accidental rotation, and a segmental gear pivoted adjacent the

ratchet wheel and adapted to engage the teeth of the ratchet wheel to rotate the same a partial rotation until the automatic lock between the shaft, flexible connection and door is released and to then become disengaged from the ratchet wheel teeth to allow the operating shaft to rotate freely.

4. In a dump car, in combination, a car body, a hinged drop bottom door, and an operating shaft, said shaft having a ratchet wheel at one end thereof, a locking latch for said wheel and a segmental gear adapted to engage a portion of the teeth of the ratchet wheel to start the rotation thereof.

5. In a dump car, in combination, hinged drop bottom doors, each provided with extensions at its free end, operating shafts arranged longitudinally of the car on each side thereof, flexible connections between said shafts and said doors, each connection

being provided with a readily detachable joint therein between two of its members, an eye-bolt detachably mounted in a threaded hole in each of said extensions and depending vertically therefrom and located directly beneath said operating shafts when the doors are in their closed position, each of said flexible connections including a hook-shaped link pivotally secured to said eye-bolt at one end and at its opposite end to an adjacent link in the flexible connection, the pivotal points of said hook shaped links being disposed in a vertical line passing through the shaft when the doors are in their closed position.

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Witnesses:

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