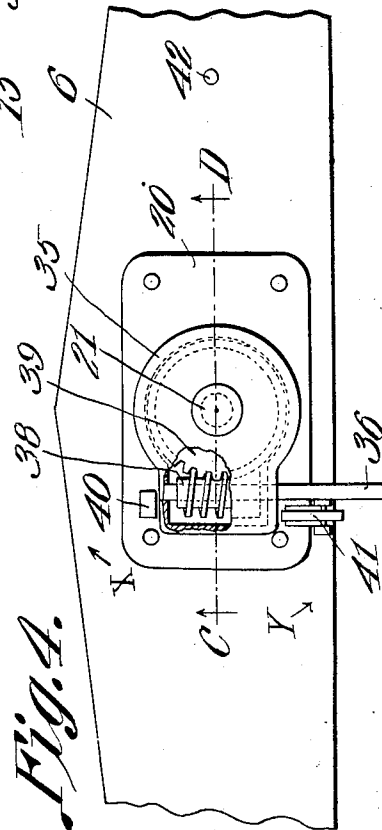
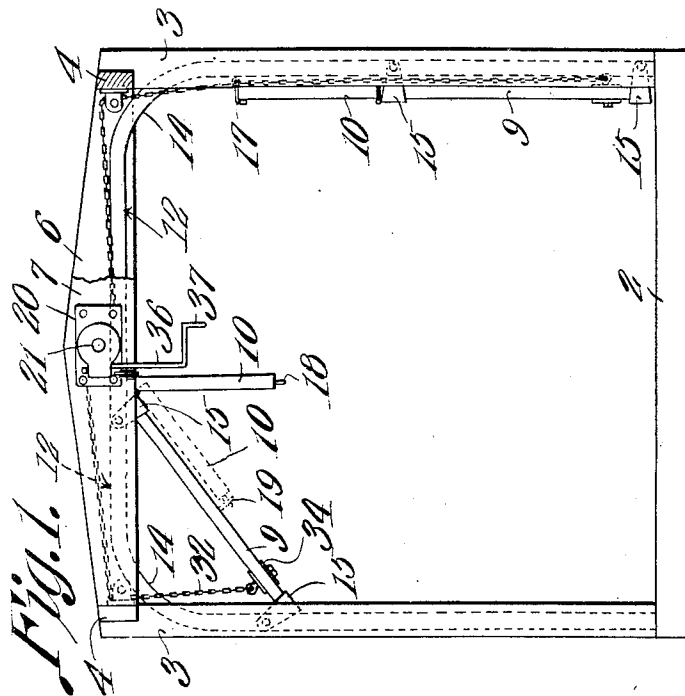
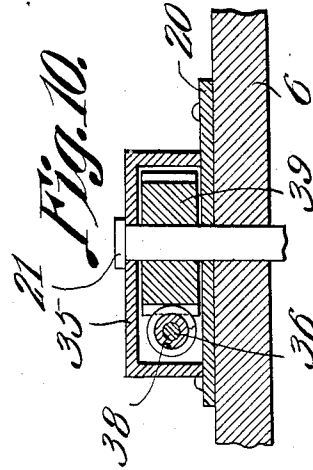
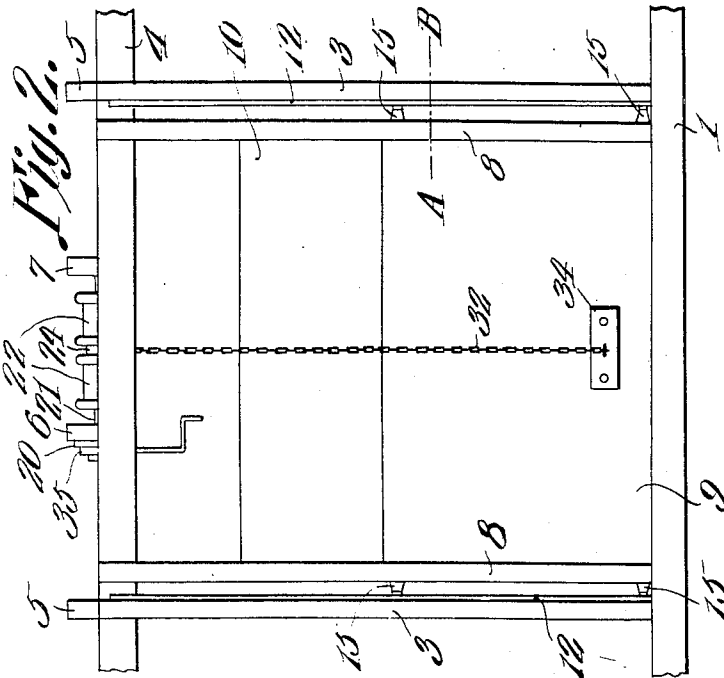


1,025,094.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 3.

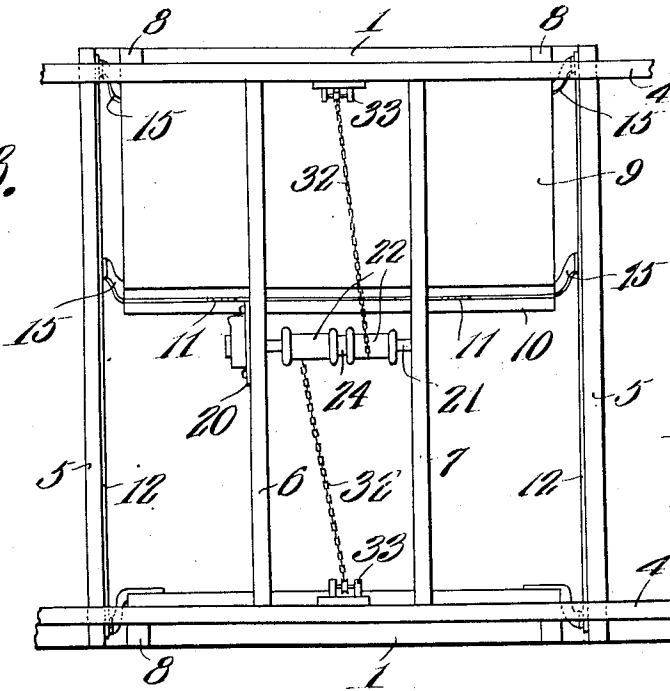


Fig. 5.

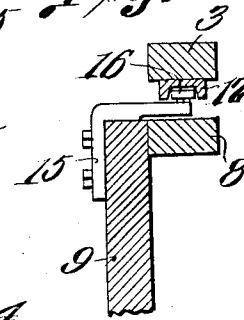


Fig. 6.

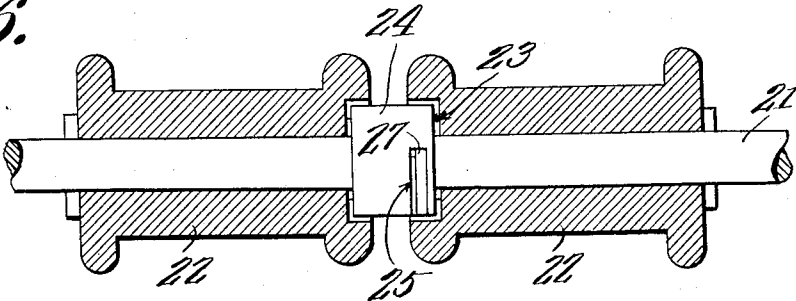


Fig. 8.

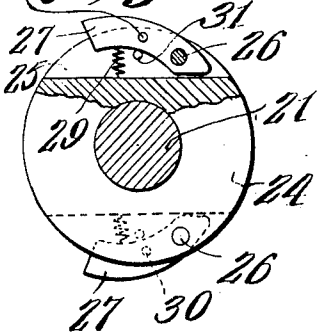


Fig. 7.

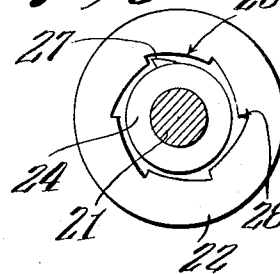
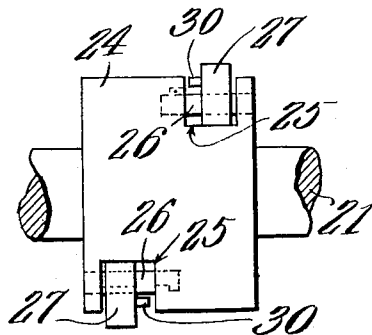


Fig. 9.



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UNITED STATES PATENT OFFICE.

HENRY KALER, OF RANTOUL, ILLINOIS.

GRAIN-DOOR FOR FREIGHT-CARS.

1,025,094.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed May 8, 1911. Serial No. 625,790.

To all whom it may concern:

Be it known that I, HENRY KALER, a citizen of the United States, residing at Rantoul, in the county of Champaign and State of Illinois, have invented a new and useful Grain-Door for Freight-Cars, of which the following is a specification.

The device forming the subject matter of this application, is a grain door structure, adapted to be assembled with a freight car, means being provided for elevating the door, and for holding the same in elevated position.

The objects of the present invention are, to provide a grain door for a car, of novel and improved construction; to provide means for mounting the door for sliding movement upon a car; to provide means for elevating and lowering the door; and to provide a door operating structure which may be disposed in an out-of-the-way position when not in use.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings,—Figure 1 is a sectional end elevation of a car structure equipped with the device of my invention; Fig. 2 is a fragmental front elevation of a car structure equipped with the invention; Fig. 3 is a fragmental top plan of a car, supplied with the door-operating means herein disclosed; Fig. 4 is an elevation of the mechanism whereby the doors are elevated, parts being broken away; and Fig. 5 is a section on the line A—B of Fig. 2; Fig. 6 is a longitudinal section of the winding drums, the actuating shaft and its accessory parts being shown in elevation; Fig. 7 is an end elevation of one of the drums; Fig. 8 is a sectional elevation of the collar which is assembled with the primary shaft, for the purpose of actuating the drums; Fig. 9 is an elevation of the structure shown in Fig. 8, the view point in Fig. 9 being at right angles to the view point in Fig. 8; and Fig. 10 is a section on the line C—D of Fig. 4.

In the drawings, a portion of a car struc-

ture is shown, and although the car structure proper, constitutes no part of the present invention, certain portions of such structure will be described. The car structure, then, comprises longitudinal lower sills 1, lower cross sills 2, uprights 3, longitudinal top beams 4, rafters 5, 6 and 7. The car structure is provided with oppositely positioned door-ways, as is common, and extended across these door-ways, vertically, are jambs 8, connected with the top and bottom portions of the car structure. Behind these jambs, and abutting thereagainst, are mounted for sliding movement, a lower or primary door 9, and an upper or secondary door 10, the doors 9 and 10 being hingedly connected along their adjacent edges, as indicated at 11 in Fig. 3.

In order to afford a slidable mounting for the doors 9 and 10, arched guides 12 extend from the bottom to the top on each side of the door opening and are carried transversely across the top of the car. The guides 12 are preferably secured to the uprights 3 which are located upon both sides of each of the door-ways, the guides being likewise secured, preferably, to the rafters 5 which lie above, and at both sides of the door-ways. The guides 12 are curved, as shown at 14, adjacent the upper corners of the car frame.

In order to connect the door structure slidably with the guides 12, the primary door 9 is equipped with angle brackets 15, extended across the edges of the primary door, as clearly seen in Fig. 5. Journaled for rotation upon the extremities of the brackets 15, are wheels 16, or other anti-friction elements, the wheels 16 being adapted to register within the contour of the arched guides 12, the guides 12 preferably being channel members.

It will be seen from the foregoing, noting particularly Fig. 1, that the cooperation between the doors 9 and 10 and the guides 12 is such that the doors may readily be elevated, the wheels 16 moving in the guides 12, and permitting the primary door 9 to assume the diagonally disposed position shown in Fig. 1, whereupon the secondary door 10 will hang pendent, vertically, from the upper edge of the portion 9 of the door. As shown in dotted line in Fig. 1, the section 10 of the door may be swung outwardly, against the section 9, and under such circumstances, the sections may be maintained in overlapped

relation, through the coöperation of a finger 18 located upon the door 10 and adapted to engage with a suitable latch 19, of any desired construction, located upon the door 9.

5 When the doors 9 and 10 are vertically alined, to effect a closure of the doorway, the doors may be maintained against upward displacement, by means of a latch 17 (see Fig. 1), preferably mounted upon one of the

10 uprights 3, and adapted to engage over the upper edge of the door 10.

A means is provided whereby the doors upon opposite sides of the car may be elevated simultaneously, or one at a time. In

15 providing mechanism for elevating the doors, a base member 20 is secured to one of the rafters 6 which lie between the rafters 5. Journalled for rotation in the base member 20, and in the adjacent rafter 7, is a primary shaft 21. Mounted for rotation upon

20 the shaft 21, are a pair of drums 22. The drums 22 have, in their adjacent end faces, recesses 23, adapted to receive the ends of a collar 24, secured to the primary shaft 21.

25 The collar 24 is provided with a pair of oppositely disposed sectorial slots 25, located out of vertical alinement. Mounted in the collar 24 and extended across the slots 25 are pins 26, upon which are mounted for swinging movement, pawls 27, adapted to engage

30 with teeth 28 formed in the inner faces of the recesses 23, as clearly seen in Fig. 7. The pawls 27 are normally swung outward, at their free ends, to engage with the teeth

35 28 of the drums 22, by means of compression springs 29, abutting each, at one end, against the collar 24, the springs 29 abutting at their outer ends, against the pawls 27, as Fig. 8 will clearly show.

40 The pawls 27 are appreciably narrower than the sectorial slots 25 in the collar 24, the pawls being mounted upon the pins 26 for lateral sliding movement, as well as for tilting movement. Outstanding from the

45 pawls 27, are pins 30, adapted to register in openings 31 (see Fig. 8) formed in the collar 24, in the side walls of the sectorial slots 25. The construction, therefore, is such that the free ends of the pawls 27 may be

50 swung inwardly, whereupon the pawls may be slid laterally, the pins 30, under such circumstances, registering in the openings 31, and serving to maintain the free ends of the pawls 27 out of engagement with the

55 teeth 28 which are formed in the ends of the drums 22.

When the primary shaft 21 is rotated, presupposing that both of the pawls 27 are engaged with the drums 22, both drums will

60 be rotated, the doors upon both sides of the car being elevated simultaneously, by means of flexible members 32 which, being connected at one end with the drums 22, pass over sheaves 33, journalled for rotation upon the

65 car structure, above the door-ways, the outer

ends of the flexible members 32 being attached, by means of securing members 34, to the primary doors 9. Therefore, when the primary shaft 21 is rotated, the chains or other flexible elements 32, will be reeled

70 upon the drums 22, causing an elevation of the doors 9 and 10, the doors 9 and 10 assuming the solid line positions shown in Fig. 1, whereupon the door 10 may be swung against the door 9, and there latched,

75 as shown in dotted line in Fig. 1.

The door upon either side of the car may be elevated separately. When it is desired to elevate but one door, one of the pawls 27

80 is swung inwardly, and then slid laterally, so as to be out of engagement with the corresponding drum 22. Under such circumstances, one of the drums 22 will be actuated, and consequently the door structure upon

85 one side of the car only, will be elevated. When it is desired to lower both of the doors, both of the pawls 27 may be locked out of engagement with the drums 22, in the manner hereinbefore described, whereupon

90 the flexible members 32 will pay freely off the drums 22, permitting the doors to slide downwardly in the arched guides 12, the doors being thus positioned, as shown in Fig. 2, to effect the closures of the door-

95 ways.

A means is provided whereby the primary shaft 21 may be rotated. This means includes a casing 35, held for rotation upon the primary shaft 21, in the vicinity of the

100 base member 20, as clearly seen in Fig. 4. Disposed at right angles to the primary shaft 21, and journalled for rotation in the casing 35, is a secondary shaft 36, provided in its depending portion, with a crank 37, or other operating element whereby the shaft

105 36 may be rotated. The secondary shaft 36 carries, within the contour of the casing 35, a worm 38, adapted to mesh into a pinion 39, carried by the primary shaft 21. Presup-

110 posing that the parts are positioned as shown in Fig. 4, it will be seen that by means of the crank 37, the secondary shaft 36 will be rotated, the worm 38 meshing into the pinion

115 39, and procuring a rotation of the primary shaft 21, whereby one or both of the drums 22 will be rotated, reeling in the flexible elements 22, and causing an elevation of the doors 9 and 10, as hereinbefore described.

When the mechanism hereinbefore described is in operation, the secondary shaft

120 36 stands in an approximately vertical position, as shown in Fig. 1. In order to maintain the shaft 36 in this position, it is necessary that the casing 35 be held against rotation. To effect this end, a lug 40, out-

125 standing from the base member 20, is adapted to engage one edge of the casing 35. A movable latch 41 is carried by the base member 20, this latch 41 being adapted to engage the opposite edge of the casing 35, from that

130

engaged by the lug 40. Referring to Fig. 4, it will be seen that the lug 40 prevents the casing 35 from swinging in the direction of the arrow X, the latch 41 preventing the casing from swinging in the direction of the arrow Y. However, the latch 41 may be tilted, to permit the casing 35 to swing in the direction of the arrow Y, so that the secondary shaft 36 will be disposed in approximately horizontal position, and out of the way of a person within the car. When the secondary shaft 36 is thus swung into a horizontal position, its crank portion 37 may be engaged over a pin or other projection 42, outstanding from the rafter 6.

The operation of the device has been dealt with step by step, in connection with the description of the various component operating mechanisms. A brief résumé may, however, be given with profit at this point. Pre-supposing that the parts are positioned as shown in Fig. 1, it will be seen that when the secondary shaft 36 is rotated, the worm 38, coöperating with the pinion 39, will cause a rotation of the primary shaft 21, the primary shaft 21 rotating one or both of the drums 22, one or both of the chains 32 being reeled upon the drums, and the doors of the car being in this manner elevated.

Having thus described the invention, what is claimed is:—

A device of the class described comprising a structure having oppositely disposed doorways; a track for each doorway, extended at its upper end transversely of the structure; doors upon opposite sides of the structure, each door engaging one track; a single shaft journaled for rotation in the top of the structure, between the doorways; and flexible elements extended in opposite directions from the shaft, each flexible element being connected to one door; each door being provided upon its upper edge with a hinged section, the hinged sections being independent of the tracks, whereby the hinged sections may swing into vertical positions, adjacent the shaft, when the doors are elevated, thereby permitting the doors to be drawn close to the shaft, and to permit an uncovering of the doorways.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HENRY KALER.

Witnesses:

NATE REUF,
E. G. STEVENS.