E. J. RUSSELL & J. W. DYE.

GRAIN CAR DOOR.

APPLICATION FILED AUG. 5, 1910.

998,041.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

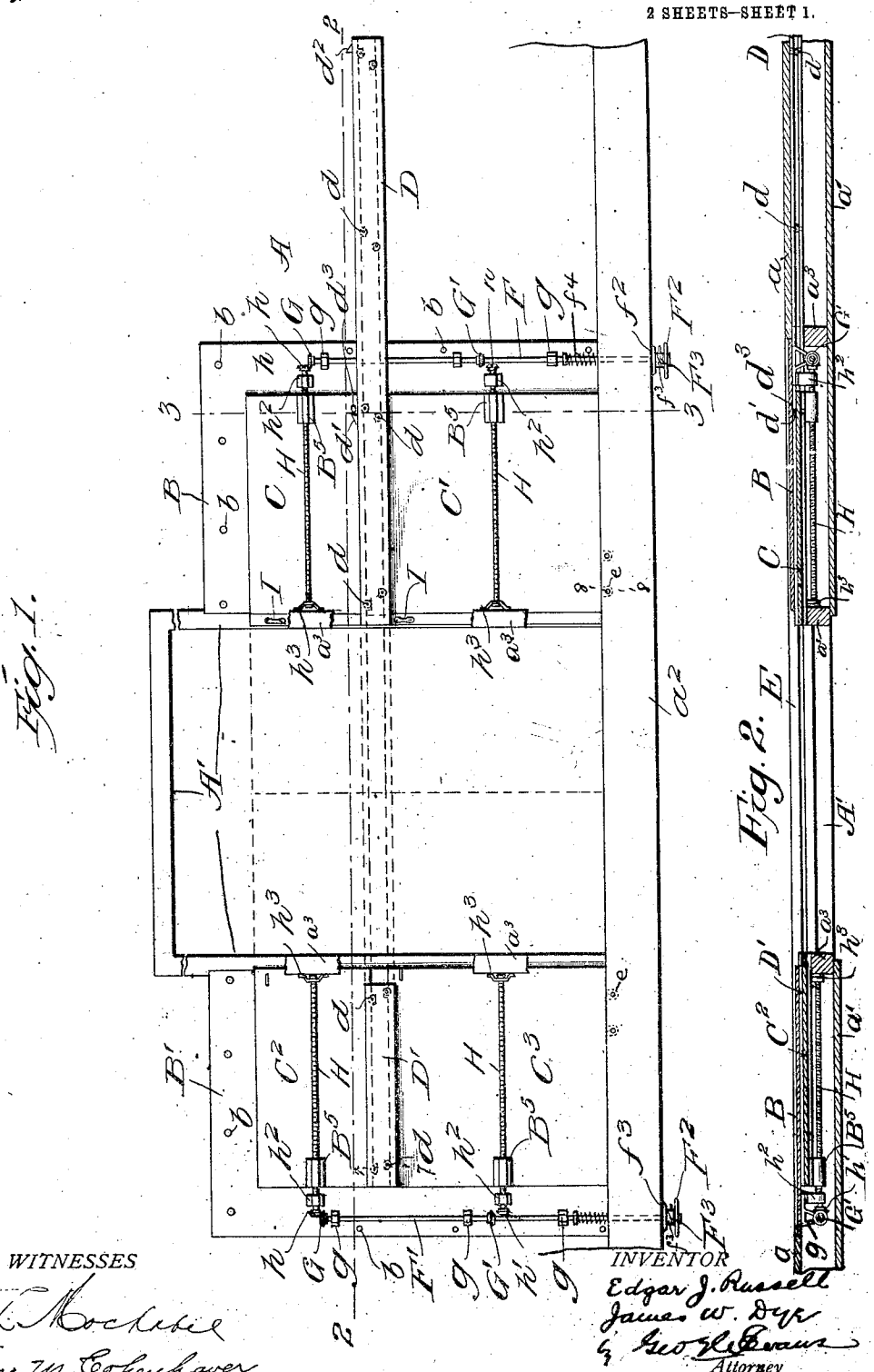

Fig. 1.

Fig. 2.

WITNESSES

T. L. Mockbee

Geo. W. Copenhaver.

INVENTOR

Edgar J. Russell

James W. Dye

by Geo. H. Evans

Attorney

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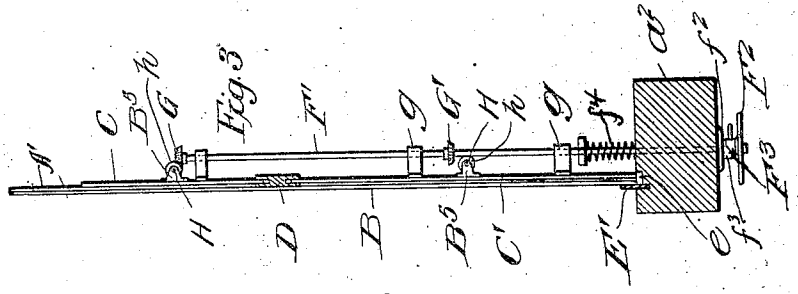

Fig. 3.

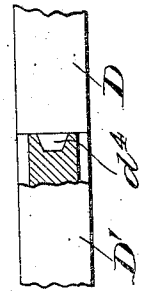

Fig. 6.

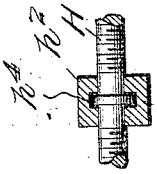

Fig. 5.

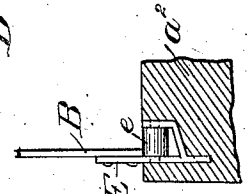

Fig. 8.

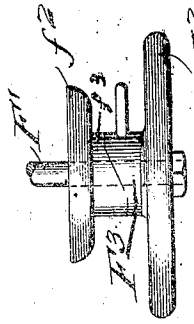

Fig. 4.

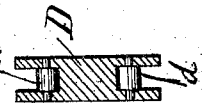

Fig. 7.

WITNESSES

T. L. Mockabee

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INVENTOR

Edgar J. Russell

James W. Dye

by Geo. H. Evans Attorney

UNITED STATES PATENT OFFICE.

EDGAR J. RUSSELL, OF ST. LOUIS, MISSOURI, AND JAMES W. DYE, OF EAST ST. LOUIS, ILLINOIS; SAID DYE ASSIGNOR OF HIS RIGHT TO ROSE E. DYE, OF EAST ST. LOUIS, ILLINOIS.

GRAIN-CAR DOOR.

998,041. Specification of Letters Patent. Patented July 18, 1911.

Application filed August 5, 1910. Serial No. 575,838.

To all whom it may concern:

Be it known that we, EDGAR J. RUSSELL and JAMES W. DYE, citizens of the United States, residing at St. Louis, State of Missouri, and East St. Louis, in the county of St. Clair and State of Illinois, respectively, have invented certain new and useful Improvements in Grain-Car Doors, of which the following is a specification.

Our invention relates to grain car doors.

The objects of the invention are to provide a sectional grain door, the sections of which are capable of being operated individually from the exterior of the car; to form the door in two upper and two lower sections, each pair having a common operating rod adapted to be successively geared to said sections; to provide the adjacent edges of one pair of doors with a traveling track adapted to be moved across the doorway and into alinement with a fixed track, on which the adjacent edges of the other pair of doors travel; to so construct the said doors that they will lie flush with the lining of the interior of the car and not interfere in any way with the operation of the usual outer doors, and to provide a sectional door of the character described which will prevent any waste of grain, be simple in construction and safe and easy in operation. These objects we attain by the mechanism shown in the accompanying drawing, in which—

Figure 1 is a side elevation of our improved grain car door, from the outside of the car, with the studding and sill removed to better show the construction. Fig. 2 is a horizontal section on line 2—2, Fig. 1, showing the framing of the car. Fig. 3 is a vertical section on line 3—3, Fig. 1. Fig. 4 is a detail view of one of the split collars on the lower end of one of the vertical operating shafts. Fig. 5, a detail sectional view of one of the horizontal brackets and the operating rod passing therethrough. Fig. 6 is a detail view of the meeting ends of the guide rails. Fig. 7 is a section through the sliding rail or track D on line 7—7 Fig. 1. Fig. 8 is a section on line 8—8 Fig. 1.

A, designates the side of a grain or freight car, A′, its door frame, a, the inner lining of the car, a', the outer side, a^2, the sill, and a^3, the vertical studding. At opposite sides of the door frame A′, are pocket plates B, B′, which are secured in place by screws b, and lie about flush with the lining a, of the car. Behind the plates B, next to the inner sides of the studding a^3 lies the sectional door which when open is concealed by the plates B. This door is in four sections C, C′, C^2, C^3; the upper and lower sections C, C′, being at one side of the doorway behind plate B, and the other two sections C^2, C^3 being at the opposite side of the doorway behind the plate B′.

D′ is a fixed track behind the plate B′, and having its upper and lower edges grooved to form ways in which slide the adjacent edges of the door sections C^2, C^3, while at the opposite sides of the doorway works a loose track or guide rail D, which also has grooves in its upper and lower edges to receive the adjacent edges of the door sections C, C′. Within the grooves of the two rails or tracks D, D′, are mounted anti-friction rollers d, which render the sliding of the doors much easier.

The sliding rail or track D. is provided on its upper edge between its ends and at its inner end with upstanding lugs d', d^2, in the path of a pin d^3, projecting from the side of the door section C, at its lower inner corner, as shown in Fig. 1, so that when the door section C, is moved across the doorway to the middle thereof the pin d^3 will engage the lug d', and move the rail or track D, with it. After this the rail D, is moved by hand entirely across the doorway until its outer end registers with the end of the fixed rail D′, see dotted lines Fig. 1; the meeting ends of the rails or tracks fitting one within the other, as shown at d^4 Fig. 6.

E, designates a track on the upper side of the car sill grooved to receive the lower edges of the two lower door sections C′, C^3, and this track is provided in its groove with anti-friction rollers e carried by brackets E′. The brackets E′ are let into the floor of the car and are riveted to the plate B and help brace it against strains.

The door sections are operated as follows: E, F′, designate two vertical shafts provided with upper and lower oppositely facing bevel gears G, G′, and these shafts are mounted in brackets g, g, secured to the inner faces of the plates B, B′. The lower ends of the shafts F, F′, are provided with

hand-wheels F^2, below the car sill, at which points the shafts pass through bearing collars f^2. The under sides of the bearing collars f^2, are formed as cams f^3 between which and the hand-wheels F^2, are rotating cams F^3 to depress the shafts against the action of their elevating springs f^4 so that their gears G, G′ may be brought into mesh with gears h, h', on the ends of horizontal screw shafts H, one of which is provided for every door section C, C′, C^2, C^3, as shown in Fig. 1. These screw shafts H are mounted to turn at one end in brackets h^2, riveted to the inner faces of the plates B, B′, and at their opposite ends are mounted in brackets h^3 secured to the door jambs or studding, see Fig. 2. Within the brackets h^2 are grooves which receive collars or shoulders h^4 on the shafts H so as to prevent longitudinal movement of said shafts. To each of the door sections is secured an internally threaded bracket sleeve B^5, through which the screw shafts H, pass so that upon rotating any one of these shafts the corresponding door section will be moved horizontally across the doorway, or vice versa.

The vertical meeting edges of the door sections are provided with hasps or other fastenings I.

The operation briefly stated is as follows: The door sections all being open, as in Fig. 1, the operator will turn the cam F^3 to lower the vertical shaft F, so that its gear G′, will mesh with the gear h' on lower shaft H, when by rotating the hand-wheel F^2 the screw shaft H will be rotated and by means of the threaded sleeve B^5 will cause the lower door section C′ to be slid across the doorway to the middle thereof. The vertical shaft F′, will now be depressed by its cam F^3 and rotated by hand-wheel F^2 to move the door section C^3 across the doorway. Then the cams F^3 will be reversed and the springs f^4 will raise the shafts F, F′, and throw the gears G, G, into mesh with the gears h, h, whereupon by rotating shaft F, the upper door section C, will be moved across the doorway to the middle thereof carrying with it the movable rail D as before described. The shaft F′ will now be rotated to move the upper door section C^2 into closed position. In opening the door, the upper sections will be opened first, then the section C^3, and finally the section C′. In opening section C, the traveling rail D, will be carried back by the pin d^3 part of the way and then shoved the rest of the way by hand. The upper edges of the door sections C, C^2, do not extend to the top of the doorway which is left open so that the contents of the car may be inspected without the necessity of opening the sectional door.

It will be understood that any of the ordinary outer car doors may be employed to close the doorway in the usual manner and we do not think it necessary to show the same.

By our construction the interior of the car when the doors are closed, presents an even or unbroken surface with no open spaces for the leakage of grain as the pocket plates lie flush with the car lining and the door sections being formed of flat metal plates the openings which receive them are very narrow and the parts all close fitting.

The doors and their pocket plates and actuating mechanism all being of metal the danger from fire is lessened.

We do not restrict ourselves to our particular construction as the same may be varied without departing from the spirit of our invention.

What we claim is:—

1. The combination in a grain car, with the upper and lower horizontally sliding door sections, and means for guiding them, a separate actuating device for each door section and operating devices movable alternately into gear with one and out of gear with the other of said individual actuating devices.

2. The combination in a grain car, with upper and lower door sections at opposite sides of the doorway and slidable toward the middle of the doorway, a separate actuating shaft for each door section, and operating shafts, common to the actuating shafts, at opposite sides of the doorway and movable alternately into gear with one and out of gear with the other of said actuating shafts.

3. The combination in a grain car, with upper and lower door sections at opposite sides of a doorway, of a fixed track for the adjacent horizontal edges of one pair of door sections, and a movable track between the adjacent edges of the other pair of door sections separate and independent thereof and adapted to register with the end of said fixed track section.

4. The combination in a grain car, with upper and lower horizontally sliding door sections, of a movable track between the adjacent edges of said door sections and separate and independent thereof, said track being movable with a door section across the door opening covered thereby.

5. The combination in a grain car, with the upper and lower horizontally sliding door sections, of a separate and independent sliding track between the two door sections and means for actuating the sliding track from a door section.

6. The combination, in a grain car, with the upper and lower sliding door sections, of a sliding track between the two door sections and separate and independent thereof and projections on one of the door sections and the sliding rail, for actuating the rail from the said door section.

7. The combination, in a grain car, of pocket plates at opposite sides of the doorway about flush with the inner walls thereof, upper and lower sliding door sections behind said plates, a fixed track for the adjacent edges of one pair of door sections, a sliding track for the adjacent edges of the other pair of door sections and separate and independent thereof, means for actuating the sliding rail from a door section, and an operating mechanism for each pair of door sections, operable from the exterior of the car.

8. In a car a grain door mechanism comprising, pocket plates at opposite sides of the doorway, pairs of sliding doors working behind said pocket plates and each having an operating device, a fixed track for the adjacent edges of one pair of door sections, a movable track between the other pair of door sections separate and independent thereof and of a length to cross the doorway, means on the one of the latter door sections to actuate said movable track, individual actuators for the door sections and main actuators movable alternately into and out of gear with said individual actuators.

9. In a car, a grain door mechanism comprising, a pair of horizontally sliding door sections at each side of the doorway, and a horizontal screw shaft operatively connected with the respective door sections and each having a bevel gear, of vertically movable shafts having external operating means and each having a pair of oppositely facing bevel gears adapted to be moved by the shafts successively into mesh with the gears on the screw shafts.

10. In a car, a grain door mechanism comprising, a pair of horizontally sliding door sections at each side of the doorway, a fixed guide for the adjacent edges of one pair of door sections, a movable guide or track between the adjacent edges of the other pair of door sections, a screw shaft operatively connected with every door section, gears on said screw shafts, two vertically sliding shafts having gears adapted to mesh with the screw shaft gears, springs to raise the shafts, a hand-wheel on each vertical shaft and split collars on the lower ends of the vertical shafts between the hand-wheels and the lower sides of the car sills, to depress the shafts against the action of their springs.

In testimony whereof we affix our signatures in presence of two witnesses.

EDGAR J. RUSSELL.
JAMES W. DYE.

Witnesses:
R. M. GITTING,
GEO. D. PFEIFFENBERGER