O. MACFARLANE.

GRAIN DOOR.

APPLICATION FILED FEB. 17, 1911.

1,001,871. **Patented Aug. 29, 1911.**

2 SHEETS—SHEET 1.

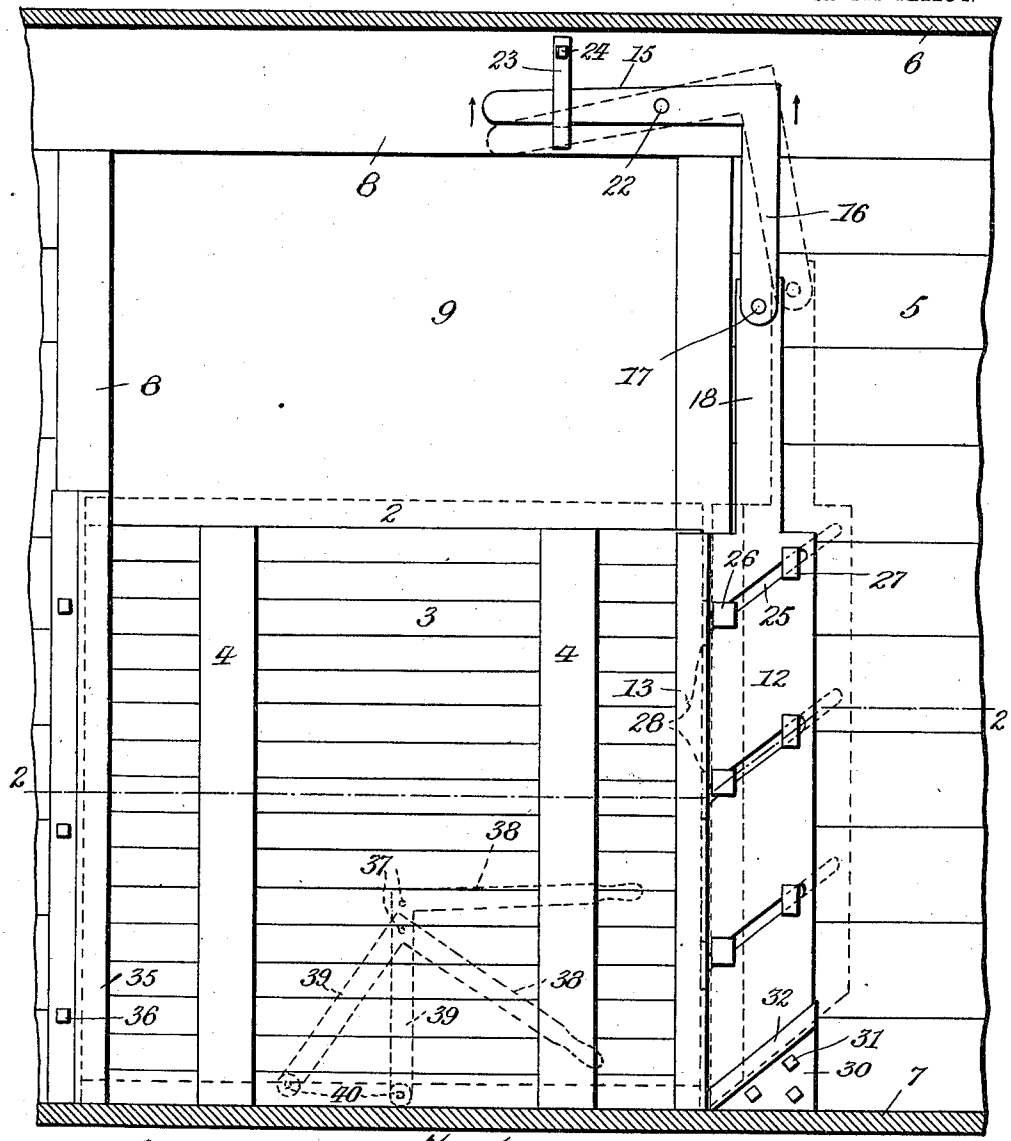

Fig. 1.

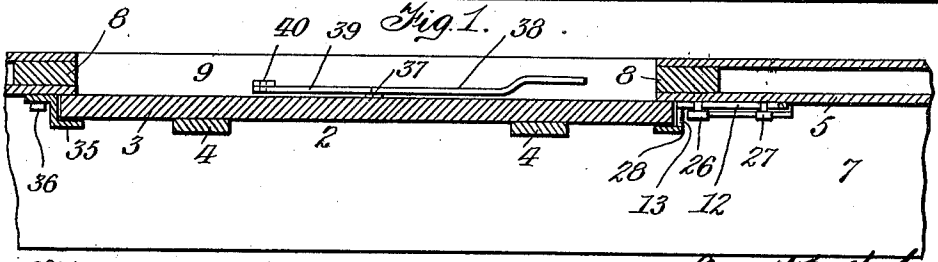

Fig. 2.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

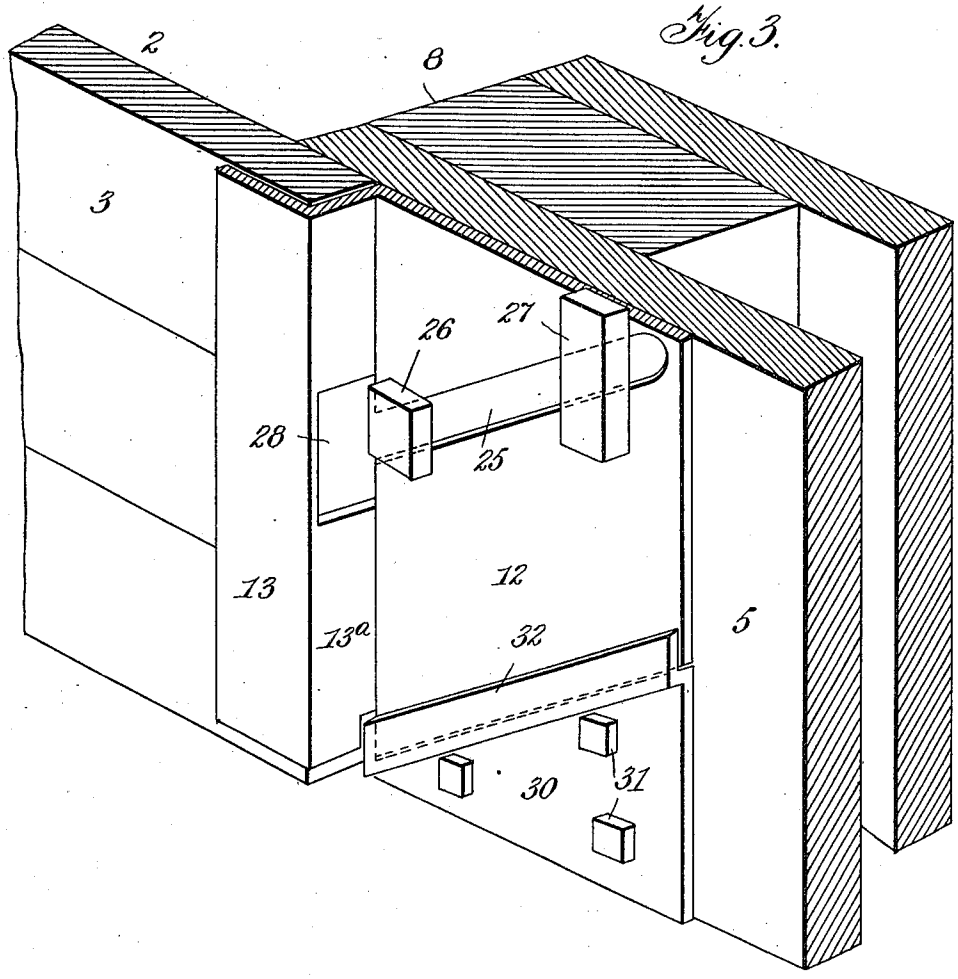
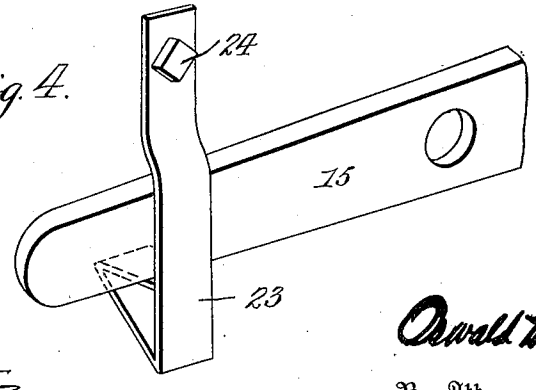


Fig. 4.



Witnesses

Oswald Macfarlane

Inventor

By Attorney

UNITED STATES PATENT OFFICE.

OSWALD MACFARLANE, OF TORONTO, ONTARIO, CANADA.

GRAIN-DOOR.

1,001,871. Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed February 17, 1911. Serial No. 609,128.

To all whom it may concern:

Be it known that I, OSWALD MACFARLANE, of Toronto, Province of Ontario, Canada, a subject of the King of Great Britain, have invented certain new and useful Improvements in Grain-Doors; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to the class of doors which are employed in connection with box cars when the latter are used for the conveyance of grain or the like and are thus known as grain doors and the object of the invention is to provide a door of this class which will be readily applicable to the ordinary box car and which will have a simple, inexpensive and easily operated locking means for retaining it in its proper position when in use, and also to provide a simple and easily accessible means whereby such door may be operated for the discharge of grain.

Other objects and the advantages of the invention will be apparent to those skilled in the art from a consideration of the following description and accompanying drawings in which the preferred embodiment of my invention has been described and illustrated in which drawings:

Figure 1 is a side elevation of a door constructed according to my invention and applied to a car, looking from the interior of the car with the floor and roof of the latter shown in section; Fig. 2 is a horizontal sectional view taken on line 2—2 Fig. 1; Fig. 3 is a perspective view of a portion of the door locking means; and Fig. 4 is a perspective view of the lock for the operating lever.

The grain door proper is shown at 2 and may be of any suitable detail construction, being here indicated as composed of cross pieces 3 reinforced and bound together by vertical battens 4.

The side of the car is indicated at 5, the roof and flooring at 6 and 7 respectively, the door frame of the usual side door opening is shown at 8, and the door opening (the lower portion of which is adapted to be closed by the grain door) is indicated by the reference numeral 9.

My improved locking means comprises a retaining strip 12 located at one side of the door and having one edge 13 thereof offset to engage and retain the adjacent edge of the door, the offset forming on the strip 12 an angular flange overlapping the said door edge and coacting with the contiguous part of the door frame to form a guide permitting vertical movement of the door while preventing displacement away from the door opening. This retaining strip is adapted to be moved toward and away from the door in a direction parallel to the latter to cause the angular flange 13 to engage with or be withdrawn from the edge of the door.

The improved means which I have devised to operate such locking strip comprises a lever fulcrum to the upper portion of the door frame or the side of the car and connected to such strip, this lever being as here shown preferably of bell-crank form with one of the arms 15 thereof forming an operating handle while the other arm 16 is pivotally connected as at 17 to an upward extension 18 of the strip 12. As shown in Fig. 1 the fulcrum point 22 of such lever is diagonally disposed from the point of connection of the lever to the locking strip thus causing the operation of the lever to impart a diagonal movement to such strip, as will be readily seen, thus moving it away from the door edge.

To normally lock the arm 15 of the bell-crank lever against downward movement, a spring latch formed of a strip 23 of resilient metal bent as shown in Fig. 4 and fastened by a bolt 24 or otherwise, may be provided. To guide the said locking strip in its movement I form it with a series of diagonal slots 25 inclining upwardly away from the flanged side thereof, through which slots, headed bolts or pins, of which there are preferably two, 26 and 27 respectively, to each slot, pass. These pins or bolts project from the door frame to which they may be secured at their inner ends in any desired manner, the heads of the bolts retaining the strip against displacement away from the door frame.

As shown particularly in Fig. 3 the wall 13[a] of the flange 13 which connects to the main body of the strip 12 is formed with openings 28 enlarging from and communicating with the lower ends of the slots 25, these openings permitting of the sidewise movement of the flange 13 past the bolts or pins 26, while the heads of the bolts 27 may be elongated vertically to engage the top and bottom walls of such openings and prevent complete displacement of the strip from the bolts.

To coact with the above described means

in guiding the strip 12 I provide a bottom plate 30 secured to the door frame by bolts 31 or otherwise and having a diagonal flange 32 adapted to engage the inclined lower end of the strip, such flange and lower end being parallel to the slots 25.

The opposite side of the door to that having my improved locking means applied thereto may be held against displacement by any suitable means as the fixed strip 35 secured by bolts 36 or otherwise to the door frame, such strip being also adapted to coact with the adjacent side of the door frame and with the strip 12 and side of the door frame contiguous thereto (when such strip is in position with the flange 13 engaging the door edge) to form guides permitting vertical movement of the door while preventing displacement away from the door opening.

In order that the door 2 may be raised from the outside a sufficient distance to permit of the grain being discharged thereunder I fulcrum upon the door as at 37 a bell crank-lever, one arm 38 whereof forms an operating handle, the other arm, 39, carrying a roller 40 adapted to be swung into contact with the door sill and thus raise the door slightly as indicated in dotted lines in Fig. 1.

The operation is briefly as follows: When the door is in position and the car filled, the grain may be discharged by operating the bell crank lever 38, 39 to raise the door slightly in the guides formed by the strips 12 and 35 and the sides of the door frame as just pointed out. To remove the door, lever arm 15 is swung in the direction indicated by the arrow in Fig. 1 to move the strip 12 to the position shown in dotted lines in such figure in which position the flange 13 is disengaged from the edge of the door which may then be swung slightly away from the door frame and moved sidewise to disengage its opposite edge from the fixed strip 35, the above described operation being reversed to replace the door in position.

I claim:—

1. A grain door provided with locking means comprising a diagonally movable retaining strip adapted to engage one edge of the door and having its bottom edge cut parallel to its line of movement, means for operating such strip, and a flanged member overlapping such lower end and forming a guide retaining the latter against displacement.

2. A grain door provided with locking means comprising a vertically disposed and diagonally movable retaining strip having an angular flange adapted to engage one of the vertical edges of the door, the wall of such flange connecting to the body of the strip being formed with openings, the said strip body being formed with diagonal slots communicating at their lower ends with the said openings, headed pins projecting through such slots and fixed in the door frame, such slots and pins forming guiding means for the said strip, and means for operating such strip to cause the said flange to engage with or disengage from the edge of the door.

3. A grain door provided with locking means comprising a vertically disposed and diagonally movable retaining strip having an angular flange adapted to engage one of the vertical edges of the door, the wall of such flange connecting to the body of the strip being formed with openings, the said strip body being formed with diagonal slots communicating at their lower ends with the said openings, headed pins projecting through such slots and fixed in the door frame, such slots and pins forming guiding means for the said strip, and means for operating such strip to cause the said flange to engage with or disengage from the edge of the door, including a bell-crank lever fulcrumed adjacent to the door frame and connected to and adapted to impart diagonal movement to the said strip.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

OSWALD MACFARLANE.

Witnesses:
VIOLA MUNSON,
DONALD SMITH HOUSE.