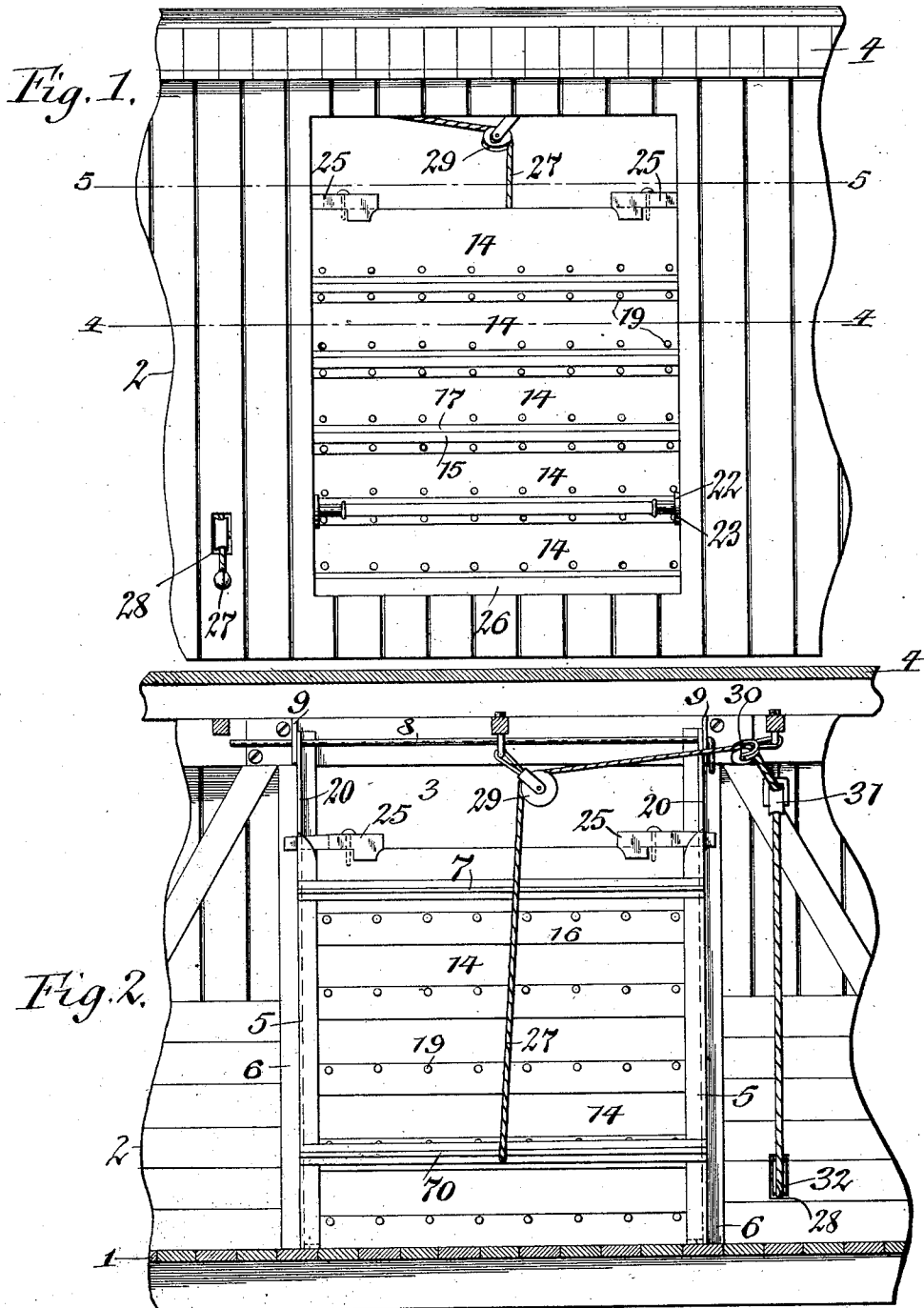


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DOOR FOR GRAIN CARS, &c.
APPLICATION FILED SEPT. 27, 1911.

1,047,947.

Patented Dec. 24, 1912.

2 SHEETS—SHEET 1.



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Witnesses.

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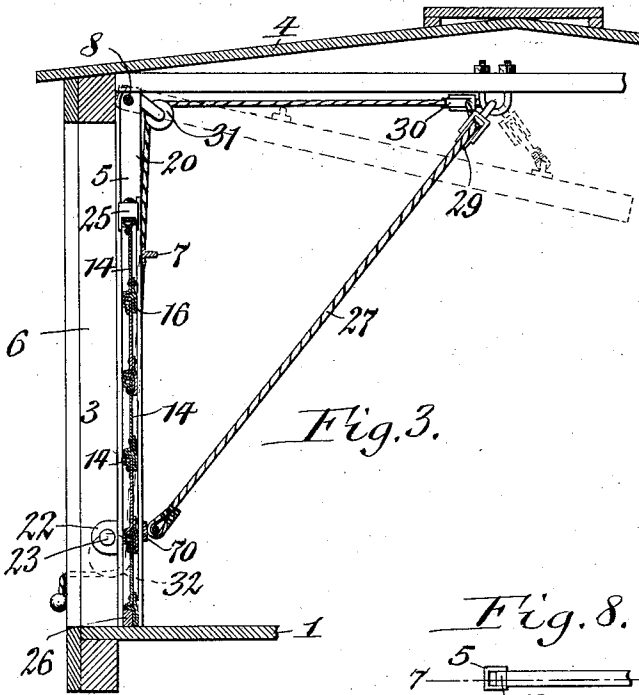


Fig. 3.

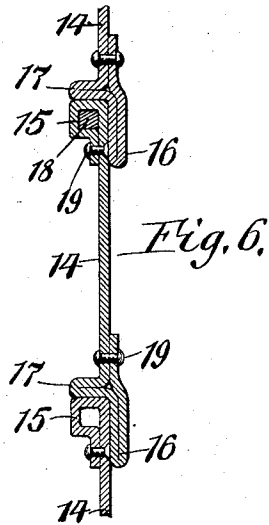


Fig. 6.

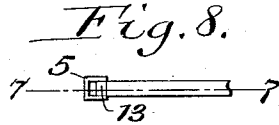


Fig. 8.

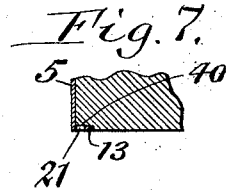


Fig. 7.

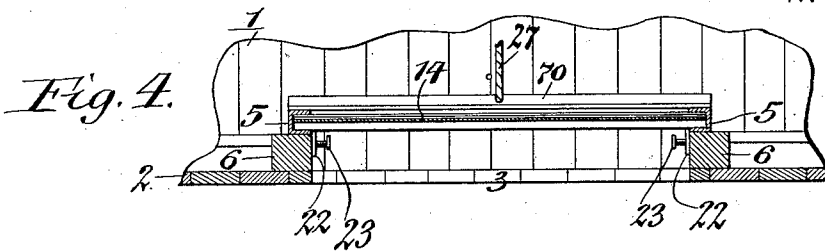


Fig. 4.

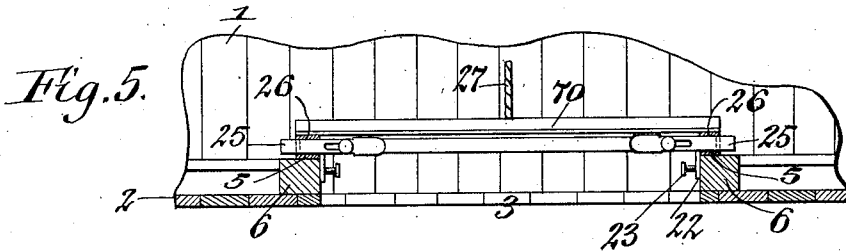


Fig. 5.

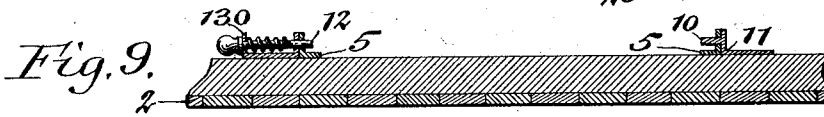


Fig. 9.

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UNITED STATES PATENT OFFICE.

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DOOR FOR GRAIN-CARS, &c.

1,047,947.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed September 27, 1911. Serial No. 651,518.

To all whom it may concern:

Be it known that I, EDWARD E. JOSEF, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Doors for Grain-Cars, &c., of which the following is a specification.

This invention relates to a door which is more particularly designed for use on cars so as to permit the latter to be used for carrying grain and similar loose merchandise as well as other kinds of freight but which may also be used as a shutter or closure for openings in warehouses or other buildings or bodies.

It is the object of this invention to produce a door of this character which can be produced at comparatively low cost, which is strong and durable in construction and easy of operation and which can be readily and conveniently transferred from one body or car to another and thus enable the door to be shipped from the place where it is no longer required to another place where the same is needed and thereby avoid the cost of equipping all of such cars with doors of this kind.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a fragmentary side elevation of a closed or box car equipped with a door embodying my improvements. Fig. 2 is a fragmentary vertical longitudinal section of the car looking toward the inner side of the car door and adjacent parts. Fig. 3 is a fragmentary vertical transverse section through the door and doorway of the car. Figs. 4 and 5 are fragmentary horizontal sections in the correspondingly numbered lines in Fig. 1. Fig. 6 is a fragmentary vertical section, on an enlarged scale, showing the construction of the panel sections of the door. Fig. 7 is a fragmentary vertical longitudinal section of one of the lower corners of the door frame and the lowermost panel, the section being taken in line 7-7, Fig. 8. Fig. 8 is a fragmentary bottom plan view of one corner of the door frame and the adjacent part of the lowermost panel section of the door. Fig. 9 is a fragmentary horizontal section showing a slightly different means from that shown in Figs. 2 and 3, for detachably connecting a door frame with the wall of the car.

Similar characters of reference indicate corresponding parts throughout the several views.

Although my improved closure or shutter may be used on various structures the same is shown in the drawings applied to a car. The body of the car may be of any ordinary construction, that shown in the drawings for example comprising a bottom or floor 1, an upright side wall 2 provided with a door opening 3 and a roof 4.

In its general organization my improved door comprises a frame which may be either permanently or detachably connected with the side wall in such manner that the same may be moved into a position across the door opening or into a position in which it clears the door opening, and within this frame is mounted a panel which is movable for convenience in assembling the parts of the door and also for the purpose of partly opening the doorway at its lower end preparatory to beginning the operation of discharging the grain or other loose freight therefrom.

In its preferred form, the frame of the door comprises two upright channel irons or bars 5, 5 which in their operative position are adapted to rest against the inner sides of the stiles 6, 6 of the door opening with their channel sides facing each other. Near their upper and lower ends these upright bars are connected by upper and lower horizontal cross bars 7, 70, which may be secured to the inner flanges of the channel irons by any suitable means such as brazing, riveting or screwing. At their upper ends the side bars of the frame are pivoted to the inner side of the head or lintel of the door opening so that the door frame can swing either into its vertical operative position across the door opening, as shown by full lines in Figs. 2 and 3, or inwardly and upwardly toward the roof of the car into a substantially horizontal position, as shown by dotted lines in Fig. 3, when the door is not required for closing the door opening. Although these side bars may be permanently pivoted to the side wall of the car it is preferable to provide a pivotal connection between the same and the body of the car which permits of readily attaching the door or removing the same from the car body. In the construction shown in Figs. 2 and 3

this detachable connection between the door frame and car body comprises a horizontal pintle rod 8 passing through corresponding openings formed in the webs of the channel-shaped side bars and brackets 9 secured to the inner sides of the lintel or head of the door opening.

In Fig. 9 is shown another way of detachably connecting the door frame with the car body this last mentioned construction comprising a fixed pintle or pin 10 arranged on a bracket 11 which is mounted on the car body on one side of the door opening and engaging an opening in the upper end of one of the side bars of the door frame, and a retractable spring bolt 12 which is mounted on a bracket 130 secured to the car body on the opposite side of the door opening and which releasably engages with an opening at the upper end of the other side bar of the door frame.

In the closed position of the door the lower ends of the side bars engage the floor of the car body. At the lower end of each side bar and within the channel thereof the same is provided with a stop 13 which preferably consists of a short horizontal strip connecting the flanges thereof, as shown in Figs. 7 and 8.

Although the panel which is movably mounted within the frame of the door may be constructed of various materials and in different ways it is preferable to construct the same of a plurality of superposed sections each section being made of sheet metal and arranged to slide vertically at its opposite vertical edges or ends in the guideways formed by the grooves or channel sides of the upright bars of the door frame. For the purpose of avoiding leakage through the panel of the door when the same is in use the lowermost section when in its operative position engages with the bottom or floor of the car body and each upper panel section laps downwardly at its lower edge past the upper edge of the next lower panel section on the inner side thereof. The sections of the door panel are also strengthened so as to enable the same to withstand the pressure which is brought against them from the inner side of the car when the latter is loaded with grain or similar loose material. For this purpose each of the panel sections is preferably constructed of a single sheet of metal to form a flat plate or body 14, an upper horizontal bead or rib 15 which is doubled outwardly and downwardly at the upper edge of the plate, a lower depending flange 16 formed by doubling the lower edge of the plate inwardly and upwardly, and a lower horizontal bead or rib 17 formed by doubling the plate outwardly immediately above the depending flange. The lower bead or rib 17 not only forms means for stiffening this part of the panel section but

also serves as a stop or shoulder which engages with the upper edge of the next lower panel section and limits the extent which it is possible to overlap these panel sections in the assembled condition of the car door. For the purpose of further reinforcing these panel sections the folded portions thereof may be constructed of tubular form and a reinforcing rod or bar 18 inserted in the same, such an additional reinforcement being shown in the upper part of Fig. 6 while the absence of such a reinforcing rod is indicated in the lower part of Fig. 6. The free edges of the folded portions of each panel section may be secured to the body or plate of the same either by rivets 19, as shown in Fig. 6, or by any other suitable means. These panel sections are slipped preferably one at a time into the guideways on the side bars of the door frame from the upper end thereof. If it is desired to place these panel sections in the door frame while the latter is detached from the car body both flanges of each channel-shaped side bar may extend continuously to the upper end of the same inasmuch as the upper ends of the channels thereof in the detached position of these bars are accessible at this time for introducing the panel sections. For the purpose, however, of permitting these panel sections to be placed in the door frame while the latter is hung on the car body the upper end of the inner flange of each channel iron or side bar is cut away, as shown at 20 in Figs. 2 and 3, a sufficient extent to permit each panel section to be inserted with its edges laterally between the webs of the side bars and then slipped downwardly into the guideways formed on the lower parts of these bars by the flanges thereof.

The lowermost panel engages at its lower corners with the internal stops or shoulders 13 formed at the lower ends of the side bars of the door frame so as to confine the panel sections within the frame. Each of the lower corners of the lowermost panel section is rabbeted, as shown at 40 in Fig. 7, so as to receive the cross piece forming the shoulder 13 and permit the lower edge of the lowermost panel section to be arranged flush with the lower ends of the frame side bars and thereby bear uniformly and evenly against the floor of the car for the purpose of preventing leakage from the car at this point.

In order to prevent any grains or similar material from lodging within the lower end of each guide way of the side bars above the shoulder 13 thereof a clearance opening 21 is formed between this shoulder and the web of each side bar through which any grain or other material which may become lodged in the guideway can escape, thereby enabling the lowermost panel section to bear fully against the shoulders 13 and avoid leakage which otherwise would be liable to occur if

the lowermost panel section were prevented from bearing fully against the shoulders of the side bars.

While the car is loaded with grain or similar material the pressure of the latter against the inner side thereof is ordinarily sufficient to keep the door in the closed position and confine the cargo within the body of the car. For the purpose, however, of preventing the vibration of the car from swinging the door open more or less and possibly losing part of the cargo by leakage each of the side bars is preferably provided near its lower end with an outwardly projecting lug 22 which is adapted to be secured to the transverse face of the adjacent stile of the doorway or opening by means of a nail, pin or screw 23, as shown in Figs. 1, 3, 4 and 5.

The several sections of the panel of the door are also held in their lowermost position and firmly in engagement with each other to prevent leakage by means of two locking bolts 25 which are mounted on the upper edge of the uppermost panel section so as to be capable of horizontal longitudinal sliding movement thereon and each of which is adapted to engage with an opening 26 in the adjacent part of the web of the companion side bar of the door frame.

When it is desired to unload a car the nails 23 are withdrawn from the stiles of the doorway, the sliding bolts 25 of the uppermost panel section are disengaged from the side bars and the several panel sections are raised together so as to form an opening between the lowermost panel section and the floor of the car through which the initial portion of the cargo of grain or similar material can escape from the car. This raising of the panel sections is preferably effected by prying the same upwardly by means of a crowbar or similar instrument inserted between the lower edge of the lowermost panel section and the floor of the car. In order to permit of thus using a crowbar for raising the panel without injuring the same the lower edge of the lowermost panel section is reinforced by means of a bar 26 of iron secured horizontally and lengthwise to the lower edge of this section on the outside thereof, as shown in Figs. 1 and 3.

After a sufficient quantity of the cargo has been discharged from the car to relieve most of the pressure on the inner side thereof the door may be swung bodily upwardly and inwardly toward the roof of the car so as to fully clear the door opening and permit the remaining part of the cargo to be discharged more rapidly.

For the purpose of permitting the door to be thus raised easily and conveniently from the outside of the car a shifting device is provided which is preferably constructed

as shown in the drawings and which comprises a rope or similar flexible shifting member 27 attached at one end to the central part of the lower cross bar of the door frame and projecting outwardly at its opposite end through an opening 28 in the wall of a car body, while its intermediate part passes over pulleys 29, 30, 31, 32 mounted on the car body adjacent to the roof and side walls, as shown in Figs. 1, 2 and 3. Upon pulling on the free end of the shifting rope from the outer side of the car after the internal pressure on the car door has been relieved the latter may be shifted from the position shown by full lines in Fig. 3 to the position shown by dotted lines in the same figure, and thereafter the door may be held in this fully opened position by securing the free end of this shifting rope in any suitable manner.

When the car is empty the door can be readily removed and transferred from one car to another, thereby permitting the car to be used for other classes of goods, products or merchandise in which tight doors are not necessary and enabling the door to be returned to the place from which grain or similar products are to be shipped. It is thus possible to make the fullest possible use of these doors inasmuch as they are not idle as would be the case if they were permanently attached to the car, thereby enabling all cars adapted to carry grain or similar material to be maintained tight at comparatively low cost.

By the use of this closure, shutter or door, cooping of the cars in the ordinary way is avoided, thereby saving the wear and tear of the cars incident to such cooping and also avoiding the waste of lumber which heretofore has always been broken and thrown away after being used but once on a car.

I claim as my invention:

1. The combination with a car having a doorway, of a frame pivotally supported at its upper end on the car at the top of the doorway and provided with two upright guide bars each of which is of U-shape in cross section forming a channel-shaped guideway which opens toward the other guide bar and each of which is provided with a stop at the lower end of its channel-shaped guideway, and a panel sliding at its opposite vertical edges in the channel-shaped guideways of both of said guide bars and engaging its lower edge with said stops.

2. The combination with a car having a doorway, of a frame pivotally supported at its upper end on the car at the top of the doorway and provided with two upright guide bars each of which is of U-shape in cross section forming a channel-shaped guideway which opens toward the other guide bar and each of which is provided

with a stop at the lower end of its channel-shaped guideway, and a panel sliding at its opposite vertical edges in the channel-shaped guideways of both of said guide bars and provided at its lower corners with notches or rabbets which engage with said stops.

3. The combination with a car having a doorway, of a frame pivotally supported at its upper end on the car at the top of the doorway and provided with two upright guide bars each of which is of U-shape in cross section forming a channel-shaped guideway which opens toward the other guide bar and each of which is provided

with a stop at the lower end of its channel-shaped guideway, and a panel sliding at its opposite vertical edges in the channel-shaped guideways of both of said guide bars and provided at its lower corners with notches or rabbets which engage with said stops and each of said stops being provided with an opening.

Witness my hand this 26th day of September, 1911.

EDWARD E. JOSEF.

Witnesses:

THEO. L. POPP,
ANNA HEIGIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
