No. 799,626. PATENTED SEPT. 19, 1905.

J. W. BOLING.

GRAIN DOOR.

APPLICATION FILED MAY 11, 1905.

2 SHEETS—SHEET 1.

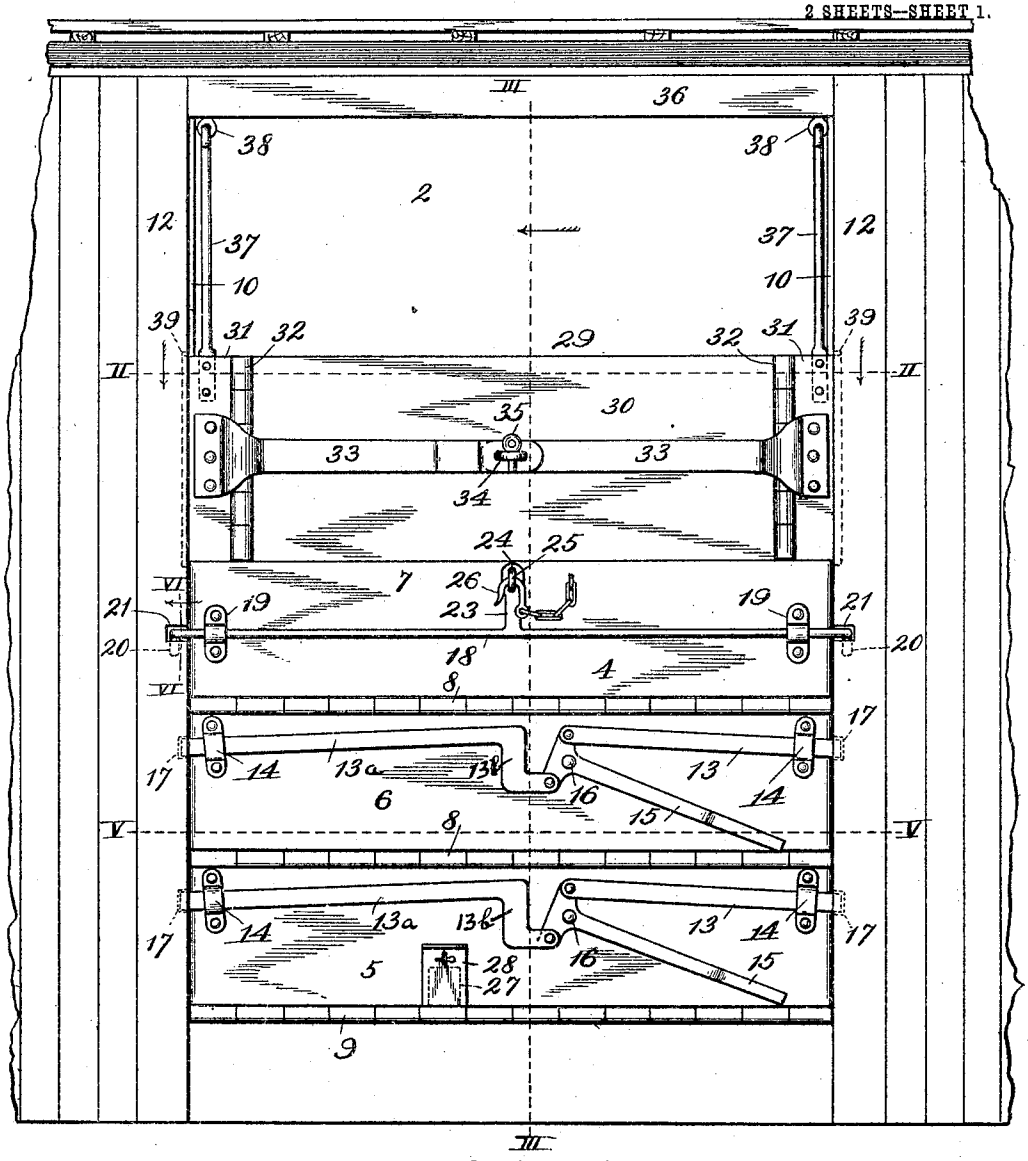


Fig. 1.

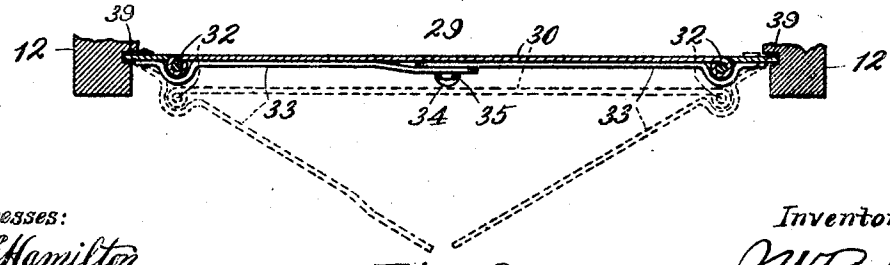


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 4.

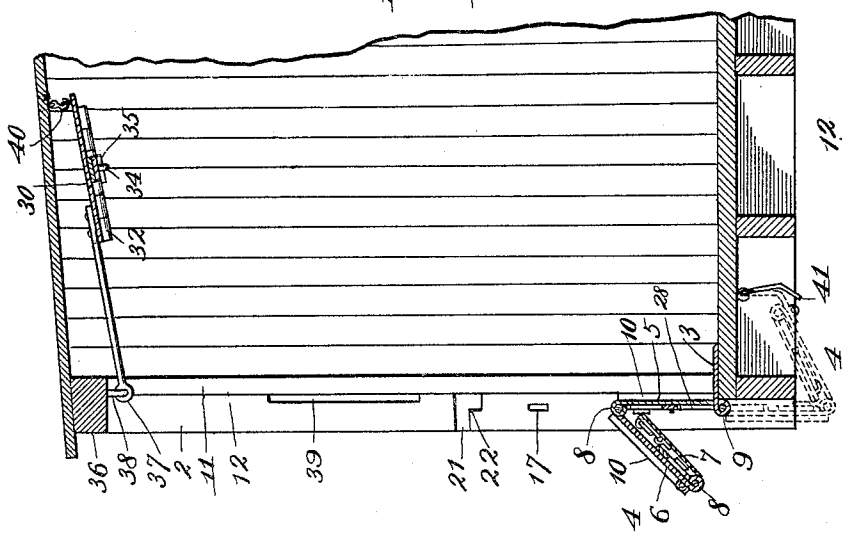


Fig. 6.

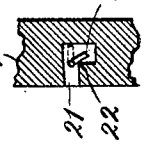


Fig. 5.

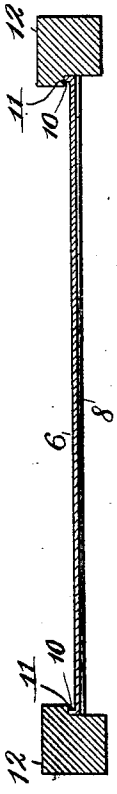
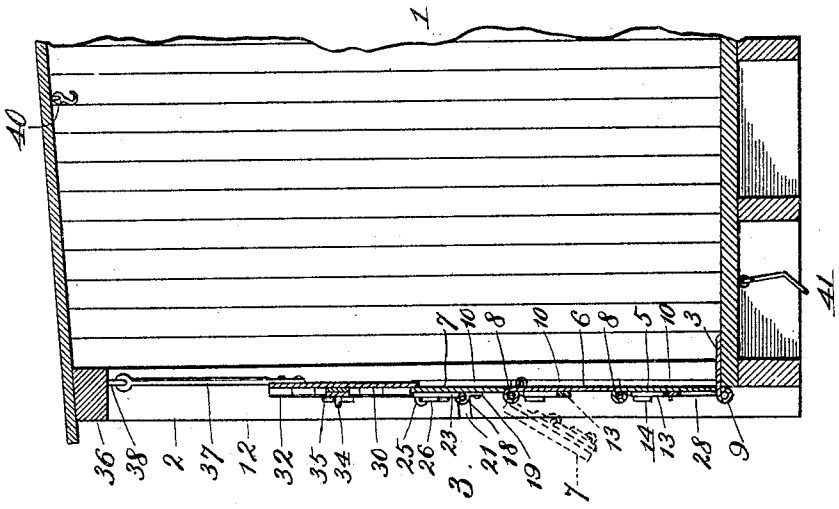


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN W. BOLING, OF KANSAS CITY, MISSOURI.

GRAIN-DOOR.

No. 799,626. Specification of Letters Patent. Patented Sept. 19, 1905.

Application filed May 11, 1905. Serial No. 260,052.

To all whom it may concern:

Be it known that I, JOHN W. BOLING, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Grain-Doors, of which the following is a specification.

My invention relates to improvements in grain-doors; and one of my objects is to provide a grain-door which will effectually close the doorways of box-cars against the leakage of grain.

The invention comprises a novel primary door, a secondary door, and means for securing said doors either in a closed or open position. The primary door consists of a plurality of sections hinged together so they may be either let down or closed one at a time, or, if desired, said door may be folded beneath the car when the latter is to be employed for other purposes than that of transporting grain. The secondary door also consists of a plurality of hinged sections and is suspended from one of the carlines, so that it may be swung upwardly beneath the car-roof when the car is being loaded or unloaded.

In order that the invention may be fully understood, reference will now be made to the accompanying drawings, in which—

Figure 1 represents a broken side elevation of a car provided with my improved grain-doors. Fig. 2 is a transverse section taken on line II II of Fig. 1. Fig. 3 is a vertical section taken on line III III of Fig. 1. Fig. 4 is a vertical section showing the primary door and the secondary door in open positions. Fig. 5 is a transverse section taken on line V V of Fig. 1. Fig. 6 is a broken vertical section taken on line VI VI of Fig. 1.

In said drawings, 1 designates a box-car having a doorway 2, provided at its threshold with a transverse metallic plate 3.

4 designates the primary door forming part of my invention. Said door in the present instance comprises three sections 5, 6, and 7, secured together by hinges 8, the lower section 5 being secured to the front edge of plate 3 by means of a hinge 9. The ends of each section have inturned flanges 10, which abut against the rabbeted portions 11 of door-jambs 12, and thus prevent leakage of grain. Sections 5 and 6 are reliably held in a closed position by means of oppositely-extending bolts 13 13^a, the outer ends of which extend through clips 14, while their inner adjacent ends are pivotally secured to T-shaped hand-levers 15, fulcrumed upon pins 16, extending through the sections. Levers 15 are arranged at an angle to the sections and their handles terminate near one end of each of said sections, so that an operator will be out of the way of the discharging grain and said sections when the latter are unlocked. By arranging the levers at an angle, as shown, it is necessary to provide the pivoted ends of bolts 13^a with right-angular portions 13^b in order that said bolts may be arranged substantially in alinement with bolts 13. As bolts 13 13^a are pivoted to the hand-levers at opposite sides of pins 16, it is obvious that when the hand-levers are moved downwardly to the positions shown in Fig. 1 said bolts will be forced into recesses 17 in the door-jambs, and thus reliably hold said sections in a closed position. Section 7 is held in a closed position by means of a lock comprising a rocker-band 18, mounted in bearings 19 and provided at its opposite ends with crank-arms 20, adapted to enter right-angular recesses 21 in the door-jambs, and when turned downwardly to the position shown in Figs. 1 and 6 bear against shoulders 22, and thus assist in holding section 7 in a closed position. Rocker-bar 18 is provided with a centrally-disposed handle 23, having a slot 24 in its free end adapted to engage a staple 25 on section 7, which has a loosely-attached hook 26 for engagement with the staple to prevent accidental disengagement of the handle therefrom.

Section 5 is provided at its lower portion with a small opening 27, through which grain may flow and be shoveled when it is desired to load it into a wagon without opening the primary door. Said opening is normally closed by a hinged door 28, which acts as a chute when open for conducting the grain into a wagon.

29 designates the secondary door forming part of my invention. Said door consists of a large intermediate section 30, provided at its opposite ends with short sections 31, secured thereto by hinges 32 and provided with levers 33, having slots in their free ends for the reception of a staple 34, projecting from section 30, and provided with a pin 35 for securing the overlapping ends of the levers, as shown in Figs. 1 and 2. The lower edge of the secondary door laps the upper edge of the primary door in order to form a grain-tight joint between said doors and is suspended from carline 36 by rods 37, depending from eyebolts 38 and secured at their lower ends

to sections 31. When the secondary door is in the closed position, (shown in Figs. 1 and 2,) the free ends of sections 31 are held by levers 33 into engagement with grooves 39 in the door-jambs.

In practice when loading grain from a wagon into a car the secondary door is swung upwardly beneath the car-roof, where it is held by a depending hook 40, and the lower section 5 of the primary door is closed, while the other two sections are placed in the folded position shown in Fig. 4, so that section 6 will perform the function of a chute in returning the spilled grain to the wagon. Then after grain has been loaded into the car on a level with or slightly above the top of section 5 section 6 is closed and the operation of loading the car is resumed, with section 7 acting as a chute, until the grain reaches a level with the top of section 6, when section 7 is closed. If heavy grain, such as wheat, is being loaded into the car, the secondary door need not be lowered, as the grain will not be loaded higher than the upper edge of the primary door; but if light grain—such as oats, for instance—is being loaded said secondary door will be lowered and secured in the position shown in Figs. 1 and 3. By constructing the primary door so that its sections may be successively raised during the loading of the car it is obvious that the car may be loaded with less labor, as the entire load need not be pitched over the uppermost edge of said door, as is necessary with a one-piece door. In unloading the car, hook 26 is removed from staple 25. Handle 23 is then grasped and turned downwardly, thus disengaging crank-arms 20 from shoulders 22, so the latter may pass out of recesses 21 and permit section 7 to drop down to the dotted position shown in Fig. 3. The hand-levers 15 on sections 6 and 5 are then successively raised to disengage bolts 13 13^a from their recesses, so that said sections may successively drop down and permit the grain to flow and be shoveled from the car. After each section has been lowered it acts as a chute in conducting the grain from the car to the wagon. Consequently there will be no loss of grain caused by the latter falling between the car and said wagon. If it is desired to open the door quickly, as would be the case in unloading at an elevator, bolts 13 are first disengaged from their recesses and crank-arms 20 are then disengaged from their recesses, as above described, so that the sections may be quickly folded and lowered. As the pressure of the grain on section 7 has a tendency to push the latter outwardly, there will be no difficulty in opening same after hook 26 has been disengaged from its staple. Consequently the door will never become jammed, and thus necessitate recourse to violence, whereby a large number of grain-doors are damaged. The secondary door may also be readily opened by removing pin 35 and grasping handles 33 and pulling them outwardly until sections 31 are disengaged from their grooves. (See Fig. 2.)

When the grain-doors are not in use, the primary door may be partly folded beneath the bottom of the car, where it is supported by a depending hasp 41, while the secondary door may be swung upwardly and suspended by hook 40, as shown in Fig. 4, thus leaving the entire doorway open when it is desired to load or unload other merchandise than grain. When occupying these positions, the doors will be out of the way, where they are not liable to become damaged, and as they do not project beyond the outer surfaces of the door-jambs the usual sliding door (not shown) may be closed without interference.

I am aware there are outwardly and downwardly swinging grain-doors; but as they do not consist of folding sections they occupy so much space that they cannot be lowered at stock-chutes or elevators, which are usually situated within eighteen to twenty-four inches from the car where the latter is in position for loading or unloading. Hence these doors must be opened before arriving at a stock-chute and closed after leaving same, and when unloading a car at an elevator the entire load must be pitched over the door. By making my door in sections I overcome the above objections, as said door may be folded so as not to interfere with either stock-chutes or elevators. A further advantage possessed by my sectional door over doors made in one piece resides in the fact that it may be folded beside or beneath the car when the latter is laden with merchandise not requiring an absolutely tight door. Hence only the ordinary sliding door with which box-cars are equipped need be operated when receiving or discharging freight, as my sectional door will be folded down out of the way. A door made in one piece must be opened and closed in addition to operating the ordinary door, as it would be impracticable to permit the former to swing in an open position while the car is in motion. Hence considerable time and labor is expended in operating the one-piece door when handling way-freight.

From the above description it is apparent that I have produced a grain-door which is comparatively simple in construction and operation, and although I have shown my preferred construction I reserve the right to make such changes as properly fall within the spirit and scope of the appended claims.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a car, of a grain-door hinged at the threshold of the car-doorway, sections comprising said door, hinges connecting said sections in such manner that each of the latter may swing outwardly and downwardly and perform, independently of

the others, the function of a chute while the car is being loaded or unloaded, and means for securing the door in a closed position, substantially as described.

2. The combination with a car having rabbeted door-jambs, of a grain-door hinged at the threshold of the car-doorway, sections comprising said door, hinges connecting said sections in such manner that each of the latter may swing outwardly and downwardly and perform, independently of the others, the function of a chute while the car is being loaded or unloaded, inturned flanges at the ends of said sections which abut against the rabbeted portions of the door-jambs when the door is closed and coact with the sections in preventing waste of grain when one or more of said sections are in an open position, and means for locking each section in a closed position, substantially as described.

3. The combination with a car, of a grain-door hinged at the threshold of the car-doorway, sections comprising said door, hinges connecting said sections in such manner that each of the latter may swing outwardly and downwardly and perform, independently of the others, the function of a grain-chute, said sections being adapted to fold upon each other and partly beneath the bottom of the car, and a hasp depending from the bottom of the car for engaging that portion of the door folded beneath said bottom, substantially as described.

4. The combination with a car, of a grain-door hinged at the threshold of the car-doorway and consisting of three hinged sections arranged to swing outwardly and downwardly and perform the function of grain-chutes, T-shaped hand-levers 15 fulcrumed to the two lowermost sections and arranged at an angle thereto so their handles will terminate near one side of the doorway, bolts 13, 13^a pivotally secured at their inner ends to the hand-levers, a right-angular portion 13^b formed integral with the pivoted end of lever 13^a, clips 14 for supporting the outer ends of the bolts, said outer ends being adapted to engage recesses in the door-jambs of the car, and a lock for securing the uppermost section in a closed position, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN W. BOLING.

Witnesses:
J. MOORE,
W. H. MCCORMICK.