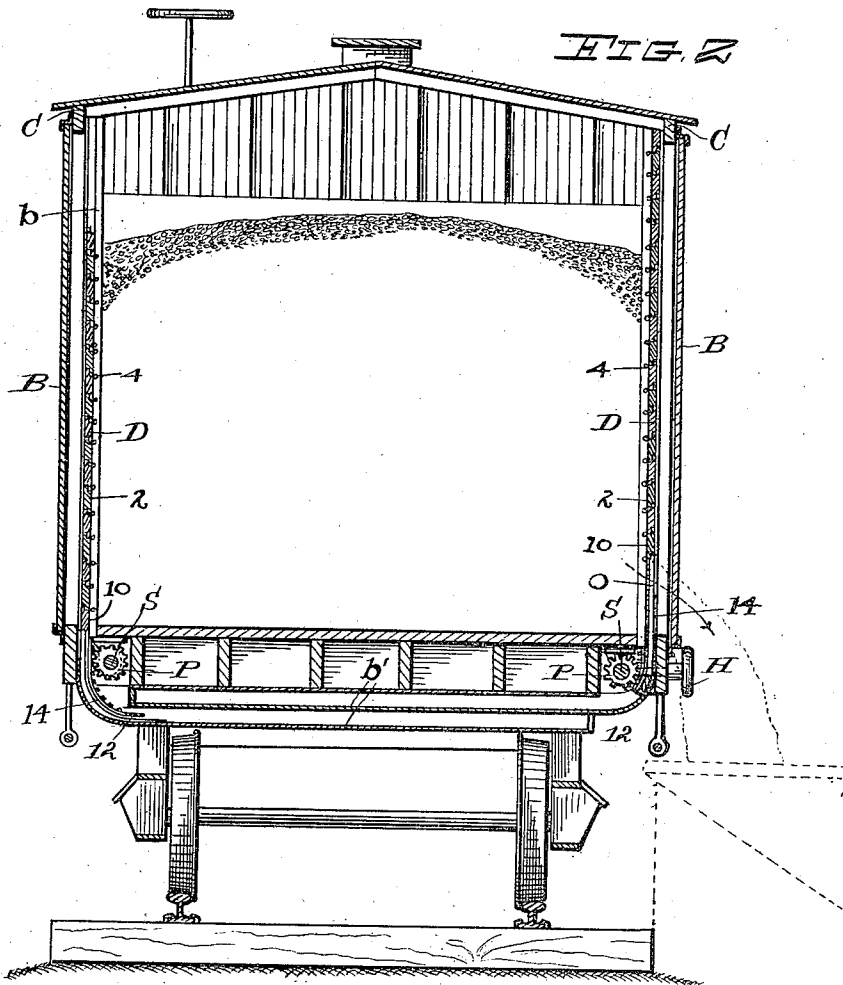
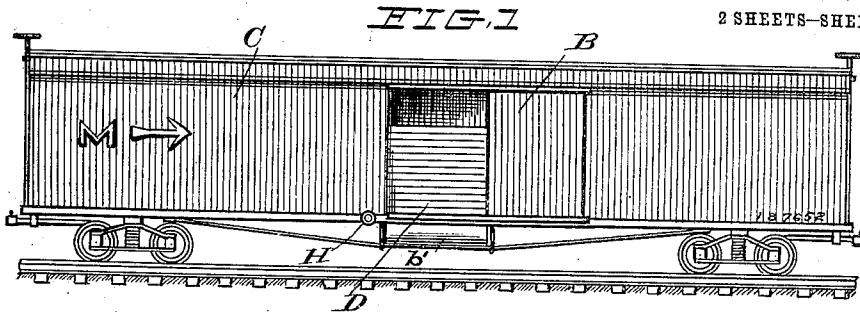


P. F. BUSCH.
GRAIN DOOR FOR CARS.
APPLICATION FILED MAY 1, 1911.

1,009,046.

Patented Nov. 21, 1911.

2 SHEETS—SHEET 1.



Witnesses.
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FIG. 3

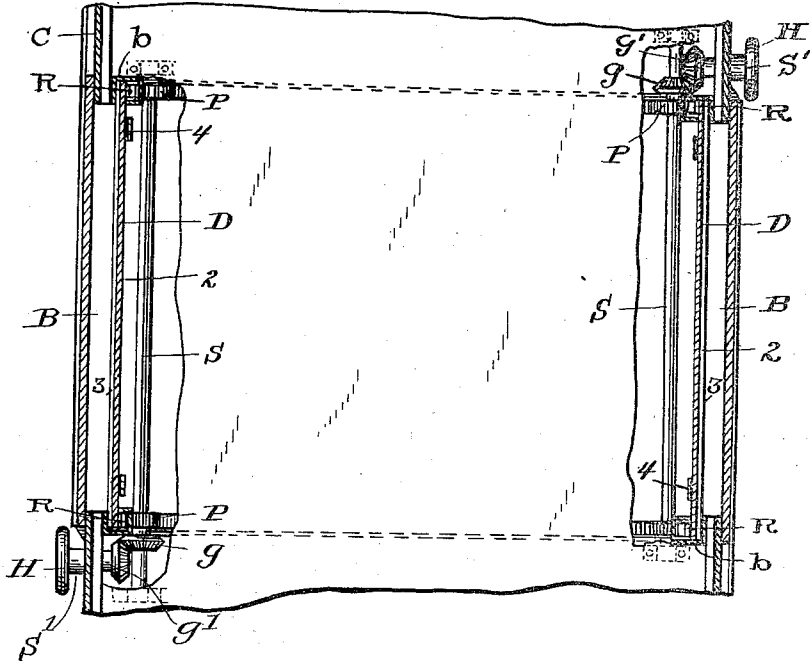


FIG. 4

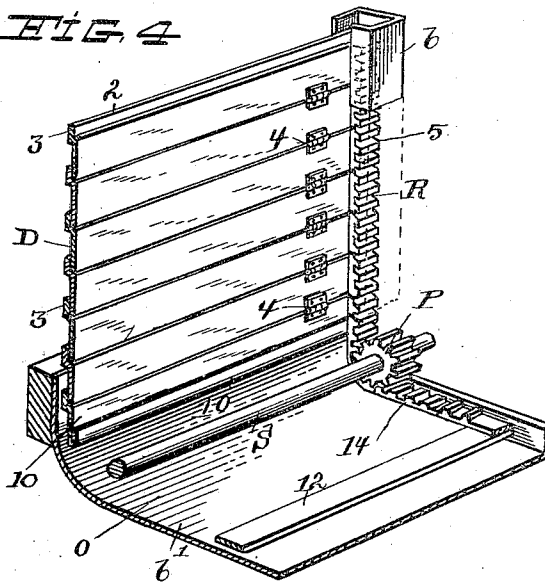
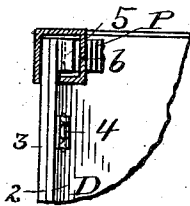


FIG. 5



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PAUL F. BUSCH, OF CLEVELAND, OHIO.

GRAIN-DOOR FOR CARS.

1,009,046.

Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed May 1, 1911. Serial No. 624,413.

To all whom it may concern:

Be it known that I, PAUL F. BUSCH, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Grain-Doors for Cars, of which the following is a specification.

My invention relates to an improvement in doors for grain cars, all substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a car embodying my invention, and Fig. 2 is an enlarged cross section. Fig. 3 is a plan of the immediate controlling means for the doors, and Fig. 4 is a perspective view of one of the doors and of the controlling means in working relations therewith. Fig. 5 is a plan view of one of the quadrangular posts and a section of a door therein.

The leading idea of the invention is to provide a flexible door for grain cars adapted to slide in guideways at the edges of the door opening and extending beneath the car so as to run said doors down out of the way when not wanted. To these ends I provide a door D for each side of the car C, and this door is supplemental to the usual outside sliding door B. The said door D is constructed from a series of corresponding slats or pieces 2 of sheet metal provided each with an offset portion 3 at what becomes the inner upper edge, said offset portion having a right angled shoulder of a depth equal to the thickness of said strip so as to make a plain and smooth interior adapted to confine the grain at the same time that the door or gate will flex to turn the angle or curve which will bring it beneath the car. A further peculiarity of the construction of this door is the hinges 4 which connect the slats or plates 2, said hinges being provided near the two ends of the slats on the inside opposite the said offsets 3. It follows that the said doors can bend or flex in making the turn beneath the car but lie perfectly flat one against one another in said offset portion when up in using position. This of course affords the desired closure for grain and enables either door to be opened more or less or raised more or less when a car is being filled with grain and also to be lowered and run entirely out of the way when

the car is unloaded or when it is used for other purposes.

One of the material advantages of this arrangement of doors, or construction of car, is that when the grain is stowed away out of use it is out of the way in every respect and leaves the car with its full capacity and room to receive any other commodity than grain up to the roof. The guides or runways for said doors are shown as substantially square sectioned or four sided posts or boxes *b*, which extend down to the bottom of the car in this or equivalent form and are supplemented beneath the car by the bottom *b'* as seen in Fig. 4. Each slat or plate is further provided with a section 5 of what becomes as a whole a toothed rack R upon the inside of each door at the edge thereof, and these rack sections run in the said guide boxes or ways *b* and confine the gate laterally as to said parts.

P represents a pinion engaged with each of said racks in the angle where door D runs beneath the floor of the car onto guideway or support *b'* beneath, and the said guideways *b'* for the opposite doors overlap beneath the car so as to provide the necessary room for storing same. Said pinions are mounted on a shaft S transversely of the door opening and a bevel gear G thereon is meshed by a corresponding gear G' on a hand actuated shaft S' which is located at one side of the door and practically out of the way and has a hand wheel H for controlling same. The pinions P mesh with the racks R and serve to operate the door D both ways. Respecting the said door or doors, it is to be further observed that there is a skip or opening in the lower portion thereof or between the so-called lower slat 10 of the door series proper and the end slat 12 while the rack R continues across said skip or opening on a flexible steel strap 14 connecting said slats 10 and 12 at its ends. The said opening is useful only in unloading or emptying a car filled with grain or other like flowing material and is made available for this purpose. These guides extend upward within the car relatively to the top thereof, as seen in Fig. 2, wherein the door D also has been run up to its limit and the opening O therein is exposed at the bottom of the car. Otherwise the door is raised only to closing position relatively as seen

in Fig. 4, or at the left, Fig. 2, and in which said case it is at least above the highest filling level of the grain in the car.

What I claim is:

5 1. A car having a door opening in its side and a guideway for the door beneath the car communicating with said opening, said door having a flexible toothed rack on its inside along each edge and extending below the
10 lower edge of the door, a shaft having pinions located in the angle between said guideway and said door opening, and a hand controlled shaft for controlling the door, whereby said door can be raised in said opening
15 with its lower edge above the floor of the car and a space is provided through which the car can be unloaded.

2. A car having a door opening, a flexible door in said opening, a series of overlapping
20 slats hinged together and a toothed rack at each side having sections corresponding to said slats, guideways for said door extending beneath the car body, pinions in operating engagement with said racks and hand

controlled means to operate said pinions and
25 raise and lower the door, the said racks extending beyond the lower edge of the door and flexible straps supporting said extensions.

3. A car having a door opening and guide- 30 ways at the sides thereof extending beneath the car body, said guideways in their upper portion being box shape in cross section, a grain door consisting of a series of slats hinged together and extending into said 35 guideways and slat provided with a section of a continuous toothed rack confined within said guideways, a shaft at the bottom of said door opening having pinions meshing with said racks and a gear on one end, and 40 a hand controlled gear meshing with said gear and adapted to operate said door.

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

PAUL F. BUSCH.

Witnesses:

LOUISE FRASCH,
MINNA SCHILLING.