

No. 897,264.

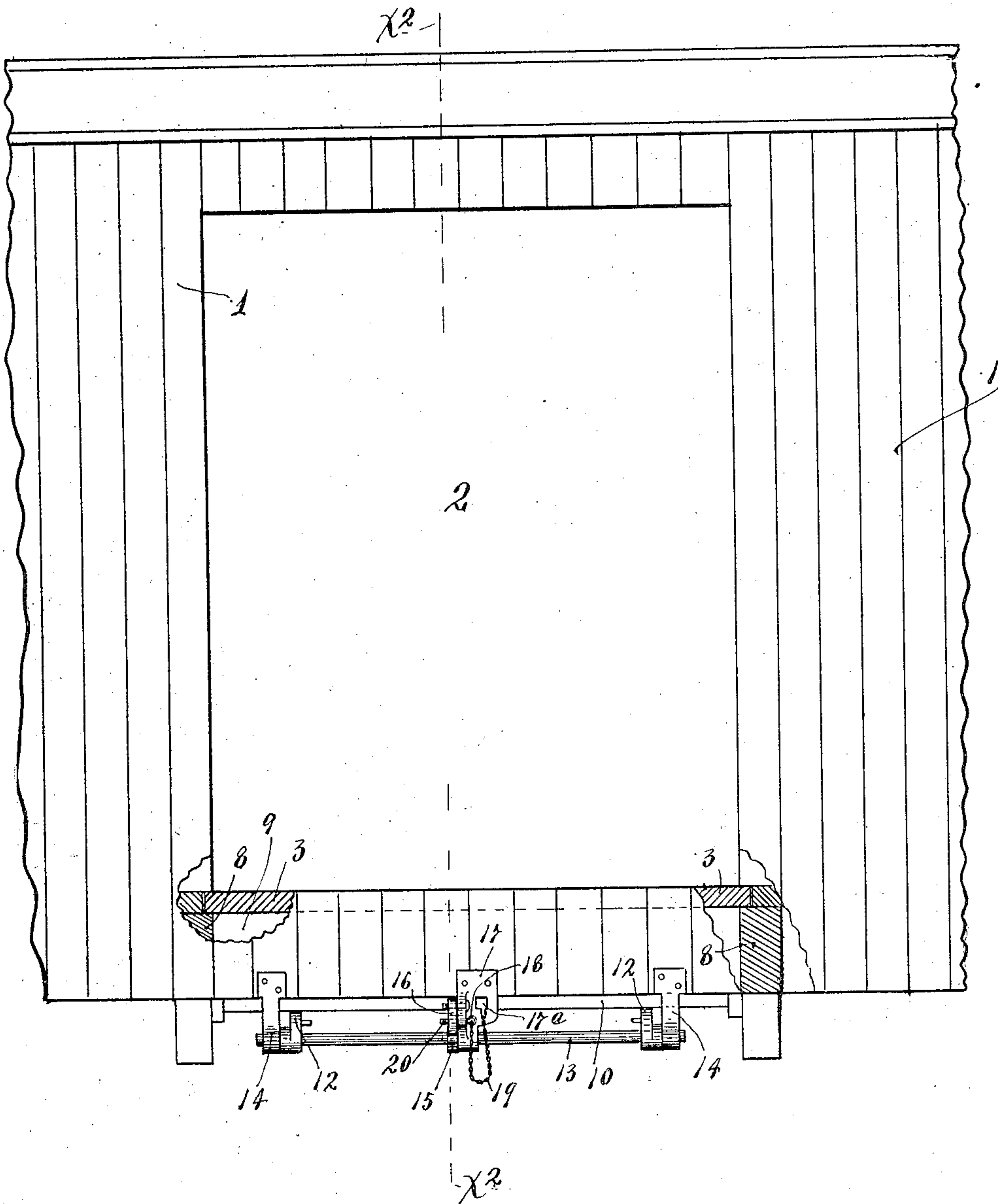
PATENTED SEPT. 1, 1908.

G. H. BEHRENDT & A. LINDQUIST.  
GRAIN DOOR CONSTRUCTION.

APPLICATION FILED NOV. 4, 1907.

2 SHEETS—SHEET 1.

*Fig. 1.*



Witnesses.  
A. H. Opsahl.  
Malin Hoel.

Inventors  
Gustav H. Behrendt  
Albert Lindquist  
By their Attorneys  
Williamson Merchant

No. 897,264.

PATENTED SEPT. 1, 1908

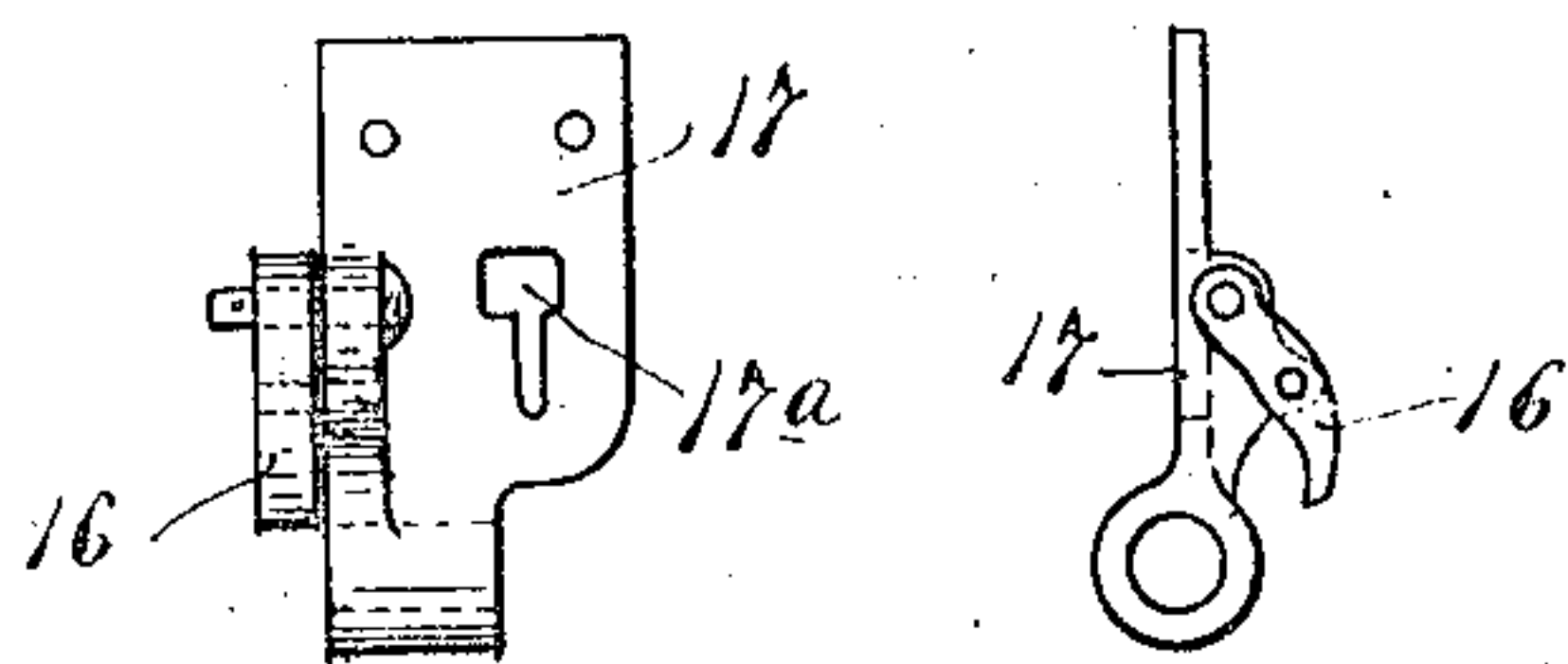
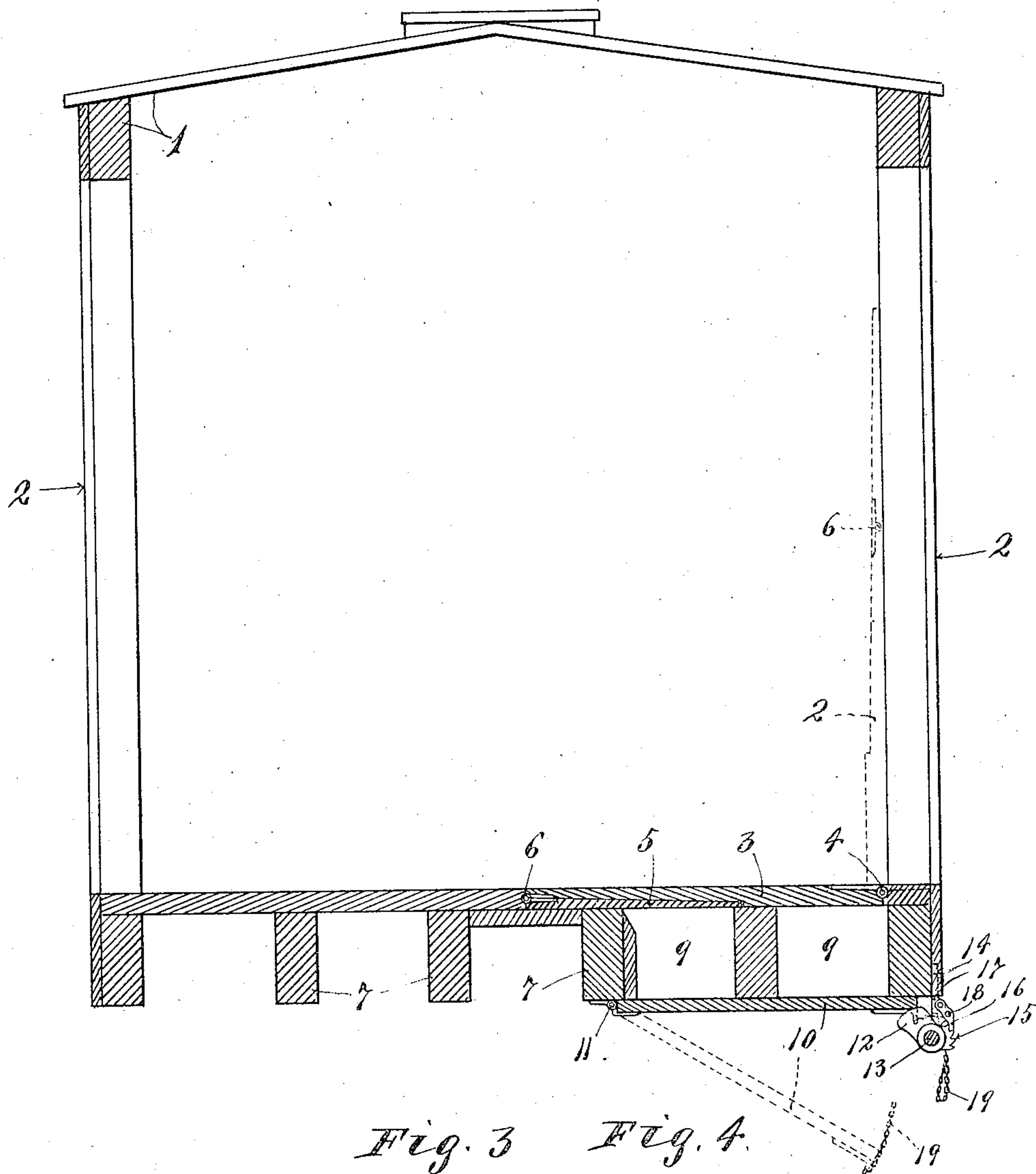
G. H. BEHRENDT & A. LINDQUIST.

GRAIN DOOR CONSTRUCTION.

APPLICATION FILED NOV. 4, 1907.

2 SHEETS—SHEET 2.

*Fig. 2.*



Witnesses

A. H. Opsahl.

Malie Hovel.

Inventors.  
Gustav H. Behrendt  
Albert Lindquist  
By their Attorneys.

Williamson & Merchant



# UNITED STATES PATENT OFFICE.

GUSTAV H. BEHRENDT AND ALBERT LINDQUIST, OF MINNEAPOLIS, MINNESOTA.

## GRAIN-DOOR CONSTRUCTION.

No. 897,264.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed November 4, 1907. Serial No. 400,483.

*To all whom it may concern:*

Be it known that we, GUSTAV H. BEHRENDT and ALBERT LINDQUIST, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Grain-Door Construction; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to cars especially adapted for use in handling grain, but adapted also for use in handling various other materials.

More particularly the invention relates to cars having drop doors or hoppers for the discharge of grain or other material.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation, showing the central portion of an ordinary box car and illustrating our invention applied thereto. Fig. 2 is a transverse vertical section taken on the line  $x^2 x^2$  of Fig. 1. Fig. 3 is an elevation, showing a lock pawl and its supporting bracket; and Fig. 4 is an edge elevation of the parts shown in Fig. 3.

The car body 1 is provided in its sides with the usual door openings 2.

In the drawings our invention is illustrated as applied to only one side of the car, but in practice it will usually be applied to both sides thereof. Adjacent to one of the door openings 2 the car floor is cut away to afford a seat for a grain door 3 that is hinged at 4 to the inner edge of the sill of the adjacent door opening 2. This door 3, when turned downward, is adapted to lie flush with the floor of the car and to form a part thereof, but when turned upward into a vertical position is adapted to engage the inner surfaces of the vertical posts of the door opening and to serve as a grain door to close said door opening. When, as is customary, grain doors are applied to both of the door openings, it is possible, but not very desirable, to have the two grain doors arranged to overlap each other, but it is preferable to have the same extend along farther down to the center of the car, and while these dimensions permit the use of a

grain door made in a single section or solid, high enough for a car loaded with wheat, will not permit the use of a solid grain door which is high enough to confine a car loaded with flax, which is lighter than wheat. Hence, the door 3 is provided with a supplemental section 5 that is hinged to the free edge thereof at 6 and is adapted, when folded, to fit a recess in the said door 3, so that its under surface lies flush with the bottom of the down-turned door. When the door 3 is turned upward into working position and the supplemental section 5 is turned upward to fit an extension thereof, as shown by dotted lines in Fig. 2, a grain door is rendered available sufficient for holding flax and similar light materials, and when the door is folded up and turned downward it is entirely out of the way and the car may be used precisely as if the grain door was not applied thereto.

The opening in the floor, which is adapted to be closed by the down-turned grain door 3, opens into a hopper formed between certain of the longitudinally extended sills 7 of the car body, and between transverse filling blocks 8 interposed between and secured to the said sills. Thus it will be seen that the sills of the car are not cut away or weakened to any extent, and that a sort of two-part hopper 9 is formed. The bottom of this hopper is normally closed by a drop door 10 that is connected to one of central members of the sills 7, by hinges 11. The free outer edge of this drop door 10 is normally engaged and held by cams or tappets 12 carried by a rock shaft 13 journaled in the bearings 14 rigidly secured to and depending from the overlying outer sill 7. Rigidly secured to the intermediate portion of the rock shaft 13 is a segmental ratchet wheel 15 that is adapted to be engaged and held by a lock bolt 16 pivotally connected at its upper end to a bracket 17 rigidly secured to and depending from the said overlying outer sill 7. The lock bolt 16, in turn, is adapted to be locked in engagement with a ratchet wheel 15 by means of a pin 18 passed through coincident perforations in the intermediate portion of said bolt and in an outwardly extended flange of the bracket 17. The headed end of the lock pin 18 is preferably connected to one end of a chain 19. The other end of this chain 19 is attached to the free edge of the drop door 10, and the intermediate portion of said chain works within and is adapted to be interlocked



with an angular perforation 17<sup>a</sup> in the bracket 17. A thin metal sealing strip 20 is adapted to be passed through a perforation in the projecting end of the lock pin 18 to hold said lock pin in working position.

When the grain door is in use to close the door opening the hopper 9, of course, becomes filled with grain. When it is desired to unload the car, first the seal 20 and then the pin 18 are removed and then the lock dog 16 is released from the segmental ratchet wheel 15, and the cams 12 are then turned downward from under the free edge of the door 10, thereby permitting the door 10 to drop and discharge the grain. Preferably the door, when lowered, is by the chain 19 held in an oblique position so that it will serve as a deflecting board to assist the delivery of the grain into an underlying bin or other receptacle. By means of the chain 19 and the angular perforation 17<sup>a</sup> in the bracket 17, the door 10 may be suspended in any angular position suitable for the proper discharge of the grain.

The grain door construction above described adds very little to the cost of a car, may be very conveniently operated, and when out of use leaves no obstructions within the car body. Furthermore, the improved grain door and hopper construction may be easily applied to cars such as found in general use.

What we claim is:

1. The combination with a car body hav-

ing a hopper in its floor structure, of a hinged door for closing the bottom of said hopper, a rock shaft supported from the floor structure in the vicinity of the free edge of said door and provided with a projecting cam or tappet arranged to engage and lock said door, a ratchet on said rock shaft, a pawl co-operating with said ratchet, and means for locking said pawl in engagement with said ratchet, substantially as described.

2. The combination with a car body having a hopper in its floor structure, said hopper having a hinged bottom door, a rock shaft supported from said floor structure in the vicinity of the free edge of said bottom door, a projecting cam or tappet on said rock shaft engageable with the free edge of said door to lock the same, a ratchet carried by said shaft, a bracket secured to the floor structure adjacent to said ratchet, a lock pawl pivoted to said bracket and engageable with said ratchet, a lock pin insertible through perforations in said bracket and lock dog to hold the latter engaged with said ratchet, and a seal applied to the end of said lock pin to hold the same in operative position, substantially as described.

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

GUSTAV H. BEHRENDT.  
ALBERT LINDQUIST.

Witnesses:

H. D. KILGORE,  
F. D. MERCHANT.