W. C. LANG.

GRAIN DOOR.

APPLICATION FILED FEB. 21, 1920.

1,357,407.

Patented Nov. 2, 1920.

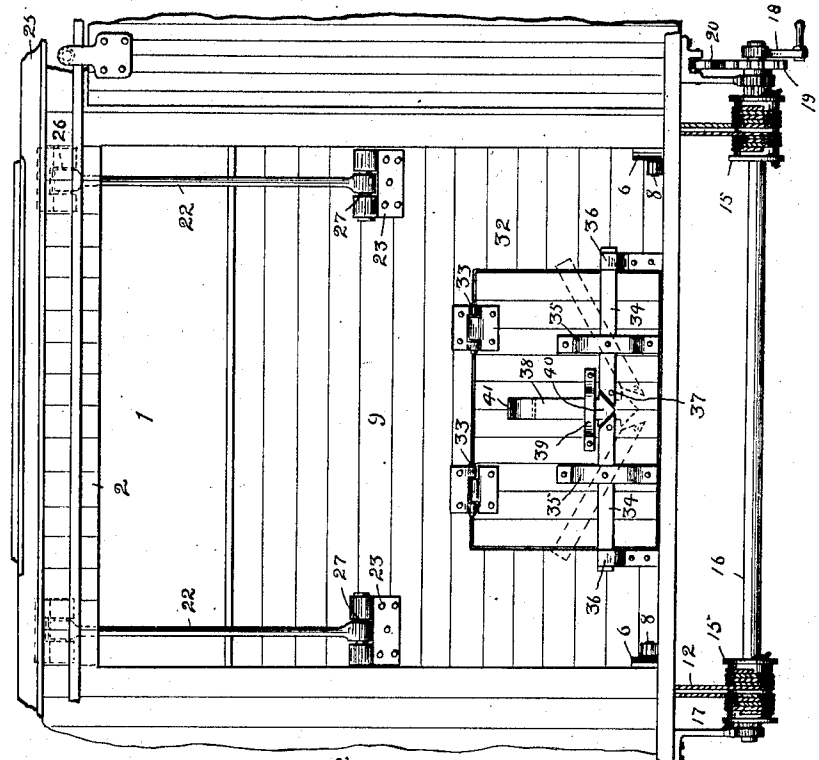


Fig. 1.

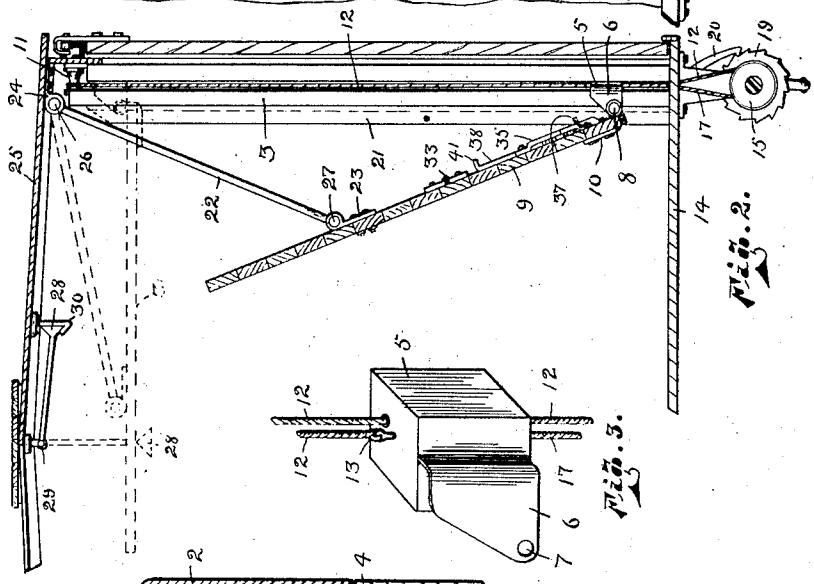


Fig. 2.

Fig. 3.

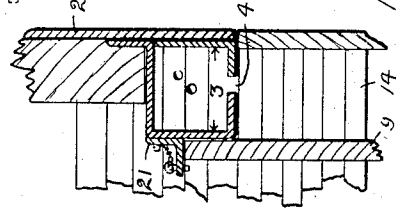


Fig. 4.

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GRAIN-DOOR.

1,357,407. Specification of Letters Patent. Patented Nov. 2, 1920.

Application filed February 21, 1920. Serial No. 360,508.

To all whom it may concern:

Be it known that I, WILLIAM C. LANG, a citizen of the United States, residing at Superior, in the county of Douglas and State of Wisconsin, have invented certain new and useful Improvements in Grain-Doors, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain improvements in car doors and has special reference to what is commonly called a grain door.

The principal object is to provide a door having improvements over what is at present known in the art.

Other objects and advantages of the peculiar construction will appear in the further description of the invention.

In the accompanying drawings forming part of this application and in which like reference characters indicate like parts:

Figure 1 is an outside elevation of one of my improved doors in position in the door opening of a car.

Fig. 2 is a transverse sectional view of one side of the car showing an edge view of the door partly open.

Fig. 3 is a perspective view of one of the sliding blocks which operate the door, and

Fig. 4 is a horizontal sectional view through one of the vertically disposed channels in which the sliding blocks operate.

1 represents the usual door opening in the side of the car 2. Upon either side of the door opening is installed a vertically disposed rectangularly shaped metal channel 3 which may be formed in any desired manner, of channel bars. These channels have vertically disposed slots 4 formed longitudinally the face thereof toward the door opening and in each of these channels reciprocably operate the door manipulating blocks 5 they being made to slidably fit within such channels with the arms 6 extending through said slots. Each block 5 has rigidly fixed thereto a thin metal angularly shaped door engaging arm 6 having a hole 7 in the extreme lower corner thereof in which the pin 8 pivotally engages the lowermost corner of the door 9, there being a suitable strap 10 fixed to each corner of the door coöperatively forming such pivotal connection with the member 6.

At the top of each channel 3 and directly thereover is mounted a small roller or sheave 11 over which the lifting block-operating line 12 is passed, one end of which line is attached to the upper face of the block 5 as at 13 and the opposite end passing through the floor 14 of the car and is passed about the drum 15 on the winding shaft 16 which is journaled directly beneath the doorway of the car and in direct alinement with the slots 4. The body portion of the line 12 passes freely through a suitable hole provided therefor in the block 5 adjacent the attachment 13 to said block.

A similar line 17 is attached to the under face of each block 5, passes down through the floor alongside of the line 12, and is wound about the same drum 15 as is the line 12 but in the opposite direction to that of said line, the ends of the ropes 12 and 17 about the drum being securely fixed thereto at opposite ends so that when the drum is rotated one line will be unwound and the other wound up thus reciprocating the blocks 5 in accordance with the direction of rotation of the drums, it being understood and as clearly illustrated that there is a drum upon each end of the shaft 16 each of which is coöperatively connected with its respective block. A crank 18 is mounted upon one end of the shaft 16 and has adjacent thereto a suitable ratchet wheel 19 and pawl 20 for holding the shaft in any predetermined degree of rotation. In this manner when the drum is rotated the door may be either raised or lowered, and as a stop for the edges of the door I have illustrated an angle bar 21 fixed to the innermost corner of each channel housing 3, which act as guides for the door, and also provides the necessary stops to prevent grain or other granular material from working out past the side edges thereof.

Approximately one-third the distance down from the upper edge of the door and adjacent each side thereof is pivotally attached a suspending rod 22, there being hinge-like members 23 fixed to the door to provide such attachment. Members 24 similar to the members 23 are fastened to the under side of the roof 25 of the car from which the rods 22 pivotally depend, the pivotal connection with the roof of the car being shown at 26 and that of the rods 22, to the door, being shown at 27. The door being thus pivotally suspended adjacent its uppermost edge will when raised by its blocks 5, assume a horizontal elevated position adjacent the ceiling of the car as illus-

trated in dotted lines at 31, and as an additional support for the door when in this position I have shown a swinging cradle or cross bar 28 pivotally suspended as at 29 from the center of the car roof, and such cradle when not used for engagement with the door may be swung upwardly against the ceiling of the car and engaged in a suitable hook 30 for such purpose, and may not necessarily be used except upon special occasions.

In the lowermost central portion of the door 9, I have shown a small auxiliary door 32 hingedly attached as at 33 to the door 9, the lowermost edge of which forms a continuation of the bottom of said door 9, and the purpose of which is to provide convenient means for affording relief of the outward pressure against the door 9 when the car is loaded, during the initial opening of the door from the exterior of the car.

I am aware that relatively small auxiliary doors of this character have been used in connection with grain doors for cars but I have shown a coöperative holding and fastening device in connection with the auxiliary door which is deemed novel and may prove of value in such combinations. This fastening device comprises two alined horizontally disposed fastening bars 34—34 which are pivotally mounted in outwardly arched vertically disposed straps 35—35 fastened to the exterior of the door. The outermost end of the bars 34 engage behind lugs 36, suitably installed for the purpose at the lowermost corners of the opening in the door 9 for the auxiliary door 32, while the innermost ends of the bars 34 are each cut away upon their upper corners forming a V-shaped space intermediate of the ends thereof when the bars are in their horizontal locked position, and I have shown adjacent each lowermost corner of the inclined ends of the bars 34 an outwardly projecting slotted pin 37, into which any form of seal or locking means may be attached, as is evident.

Centrally disposed intermediate of the straps 35 is reciprocably mounted the operating bar 38 behind the horizontally disposed strap 39, said bar 38 having an arrow-like head 40 which normally rests within the V-shaped space intermediate of the ends of the bars 34. The upper termination of the bar 38 is turned outwardly as at 41, forming a convenient projection for manually manipulating the same.

By this construction it is evident that the outer ends of the bars 34 may be quickly raised from behind the lugs 36 by depressing the bar 38, the bars 34 having a normal tendency to remain locked or engaging the lugs 36, by their pivotal connection being nearer the inner ends thereof than the outer ends.

It is to be understood that various modifications and changes within the scope of the appended claim may be resorted to without departing from the spirit of the invention.

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

The combination with a door of the character described for partly closing the door opening in a car, of supporting means suspended from above the opening and pivotally attached to the door, vertically disposed channels at the sides of the door opening, reciprocal blocks housed within the channels, arms extending therefrom and pivotally attached to the door, operating lines or ropes within the channels for raising and lowering the blocks, and a horizontally disposed manually rotative drum-carrying shaft below the door and externally of the car for simultaneously operating the lines or ropes in the manipulation of the door.

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

WILLIAM C. LANG.

Witnesses:
H. L. Laliberte,
S. Geo. Stevens.