April 8, 1924. 1,489,643

K. R. KOSKINEN

FREIGHT CAR DOOR

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Fig. 2.

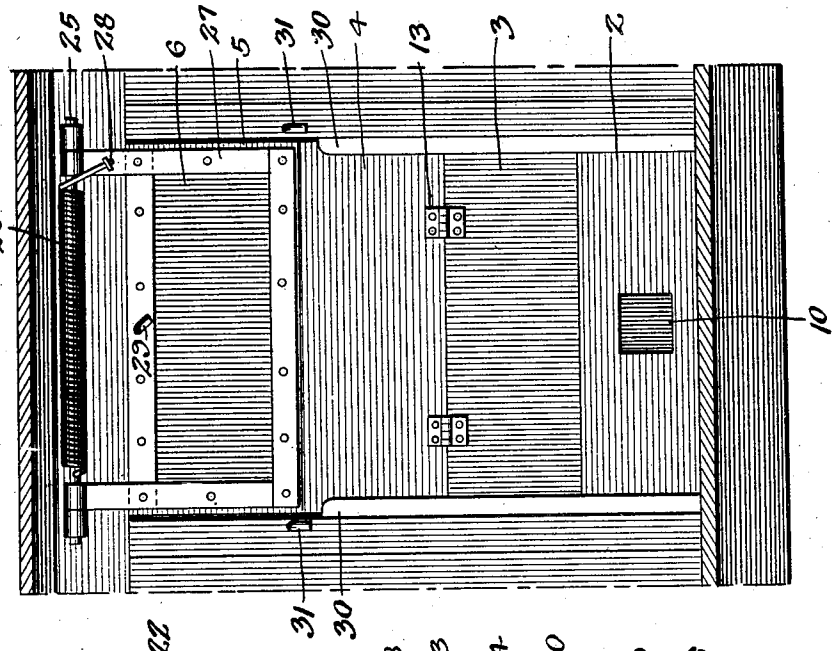
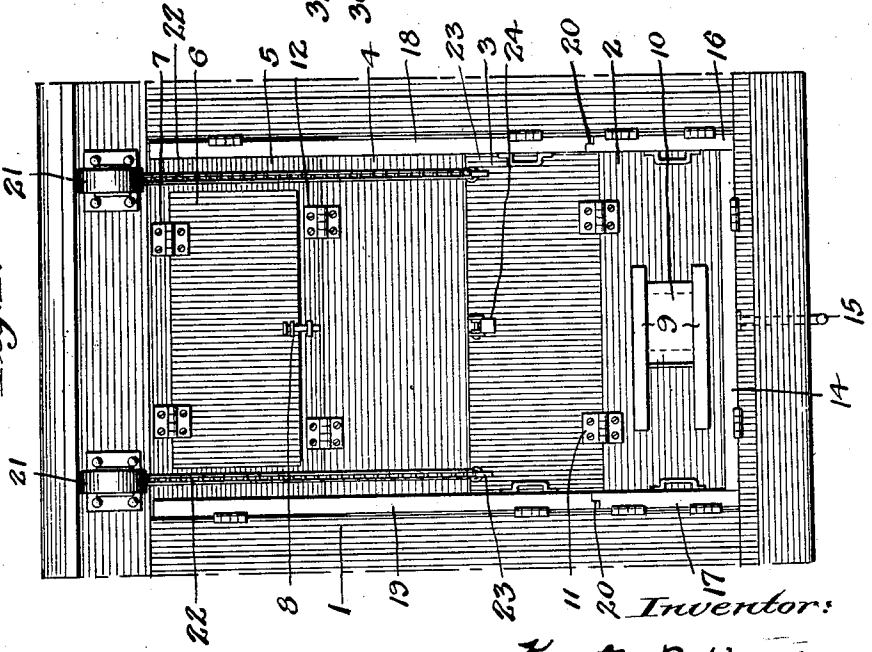


Fig. 1.



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Fig. 5.

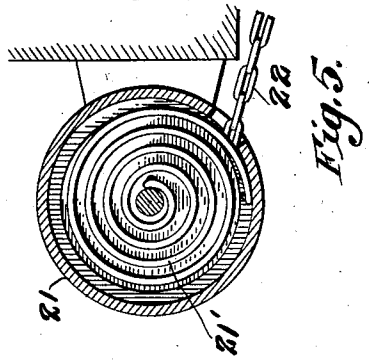


Fig. 4.

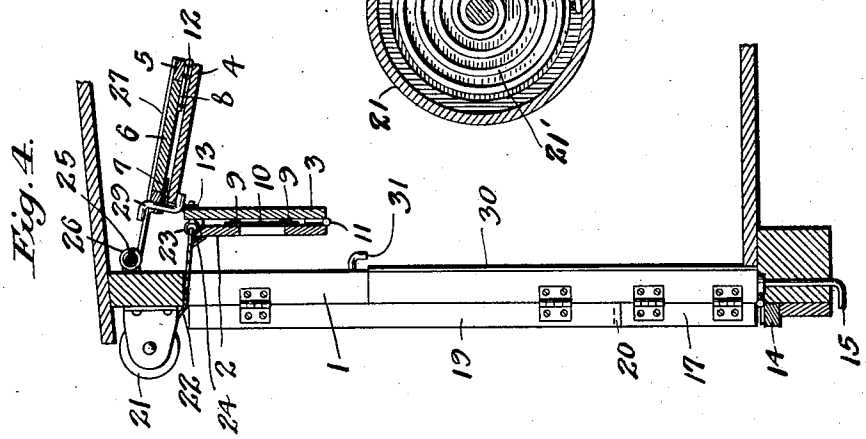
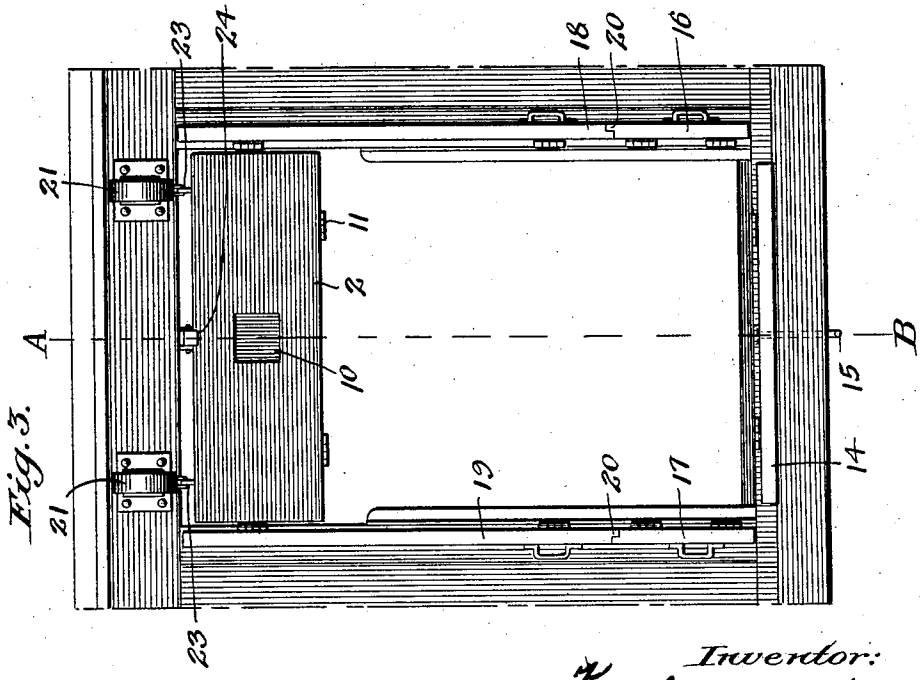


Fig. 3.



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Patented Apr. 8, 1924. 1,489,643

UNITED STATES PATENT OFFICE.

KUSTA R. KOSKINEN, OF DULUTH, MINNESOTA.

FREIGHT-CAR DOOR.

Application filed August 5, 1919. Serial No. 315,481.

To all whom it may concern:

Be it known that I, KUSTA R. KOSKINEN, a subject of the Russian Government, residing at the city of Duluth, in the county of St. Louis and State of Minnesota, have invented new and useful Improvements in Freight-Car Doors, of which the following is a specification.

This invention relates to a freight car door and aims to more particularly provide a door of this nature which is made up of sections which may be opened from the bottom up thus permitting the gradual removal of the contents of the freight car, such contents being grain, for which this door is more particularly constructed, so that a loss of the same upon wasting upon the ground is eliminated.

My invention further aims to provide a door of this construction which will be readily operable in contradistinction to the doors now in use which are very cumbersome.

As illustrating my invention I refer to the accompanying drawings in which:—

Figure 1 is a front elevation of my device.

Figure 2 is a rear elevation thereof.

Figure 3 is a view similar to Figure 1, but in which the panels of the door have been raised.

Figure 4 is a sectional view taken along the line A—B of Figure 3.

Figure 5 is a detail sectional view of one of the casings 21, showing interior mechanism.

In these drawings like reference numerals refer to like parts, and 1 designates the framework of the car door.

The door itself comprises panels 2, 3, 4 and 5, the upper panels being additionally provided with a door 6 hinged as at 7 and secured in position as indicated at 8. The panel 2 is also provided with guide members 9 in which a sliding door 10 is mounted.

It will be understood that the door 6 is provided, so that the grain may be inspected during transit and a slide door 19 to inspect the bottom layers thereof as well as for securing samples of the grain contained within the car.

The panels 2 and 3 are hingedly secured together by means of the hinges 11 while the panels 4 and 5 are likewise secured by hinges 12, the panels 3 and 4, as shown in Figure 2, being secured by hinges mounted upon the opposite face from the aforementioned hinges, as indicated by 13.

Hingedly secured to the base of the frame 1 is a strip 14 which is swung upwardly by means of the pin 15. Side strips 16 and 17 are provided for engagement with the sides of the panels 2, such side strips being also hingedly connected to the framework 1. Additional side strips 18 and 19 extend from the upper faces of the strips 16 and 17 to the top of the door, such strips 18 and 19 being also hingedly secured to the framework 1. It will further be noted that at the point of engagement between the strips 16 and 18 and 17 and 19, there is an interlocking joint 20 provided which effectually prevents any movement of the strips 18 and 19 until subsequent to the movement of the strips 16 and 17.

Heavy coil springs, not shown, are provided in casings 21 which springs are secured, in any convenient manner, to chains 22, the lower ends of which are fastened to panels 3 by means of hooks 23, a catch 24 being mounted upon such panel adjacent the upper edge for a purpose hereinafter set forth.

Referring now more particularly to Figure 2 it will be seen that the rear of such door is constructed as follows:

Mounted above the upper panel of the door and firmly secured to the framework thereof is a shaft 25 mounting a very strong spring 26 which engages a framework 27, which is bolted to the rear side of the panel 5, as indicated at 28, thus exerting a swinging force to such panel. Mounted upon and extending through the upper edge of the panel 5 is a catch 29 the function of which will be hereinafter explained.

Guide members 30 are provided along the vertical edges of the door framework and terminate at a point slightly below the joint between the panels 4 and 5, catches 31 being mounted in the framework 1 in a position slightly above the upper edges of the guides 30.

In operation it will be seen, assuming that the door is in the position shown in Figure 1, that all that is necessary for the opening of the door is to knock the pin 15 upwardly resulting in the folding back of the hinged strip 14. The hinged strips 16 and 17 may then be opened permitting such

grain as will come out by reason of the force of gravity to come through the opening thus provided between the lower edge of the panel 2 and the framework 1. If desired, a certain amount of grain may be fed out through the door 10 thus further eliminating waste.

Having proceeded this far, the strips 18 and 19 may be swung back and the panel 2 folded back upon the panel 3 and secured in position by means of the catch 24. All of the grain which will come out by means of the force of gravity will now fall through the opening thus provided and subsequently it is perfectly safe to pull the panels 2 and 3 slightly forward thus breaking the toggle formed at the hinges 12 between panels 4 and 5. The springs provided within the casing 21 will now begin to act upon the door through medium of the chains 22, secured to the panel 3 as at 23. The rising motion imparted to the panels 2 and 3 and swinging motion to the panel 4 by the springs in the casing 21, will continue until the panel 4 is folded up against the panel 5 and in this position may be secured by means of the catch 29.

It will be noted that in the above mentioned position all of the panels are now clear of the guide 30 and that the catches 31 may now be swung back from engagement with the panel 5 permitting the spring 26 to function resulting in the elevation of all of the panels to the position indicated in Figures 3 and 4.

It will be understood that my invention is subject to certain modifications without departing from the scope thereof and it will be seen that I have provided a greatly improved car door which, while working with a maximum ease, provides for a minimum of wastage of the car contents.

It will be further understood that to close the door the operation described in opening the same will simply be reversed.

Having thus described my invention, what I claim is:—

In a structure of the class described, a door frame, a door comprising a number of panels, hinges connecting the lower side of the uppermost panel to the upper side of the second panel and hinges connecting the upper side of the third panel to the lower side of the second panel and arranging said panels to close together, pivotal supporting means for the upper panel permitting the door, when folded, to swing inwardly and upwardly, a spring to so swing the door, and yieldable hoisting means on the outer side of the door frame and above the door, including chains connected to one of the lower panels.

KUSTA R. KOSKINEN.