J. A. RICHLEY.

GRAIN CAR DOOR.

APPLICATION FILED APR. 4, 1910.

993,876.

Patented May 30, 1911.

2 SHEETS—SHEET 1.

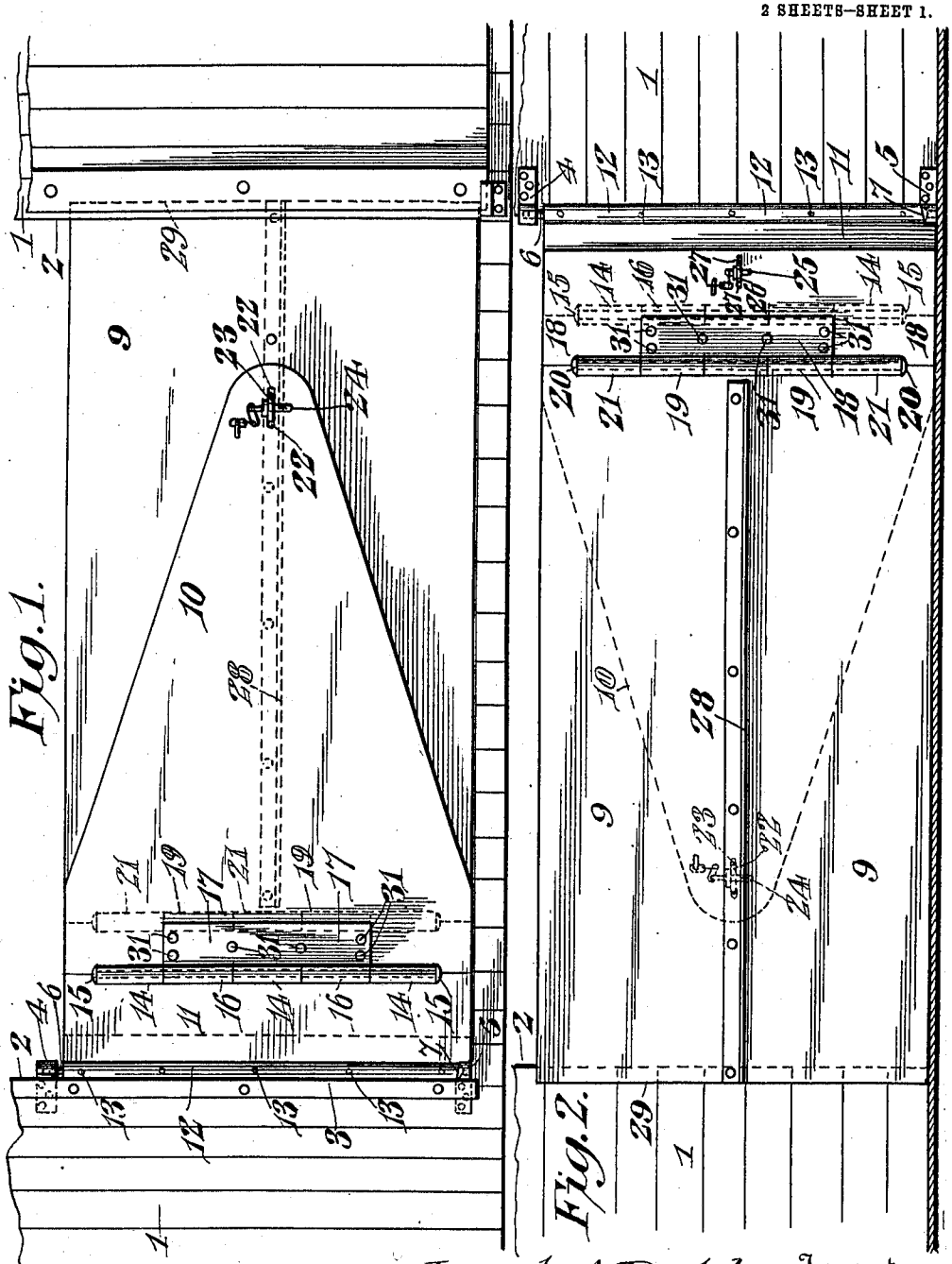

Fig. 1.

Fig. 2.

Witnesses

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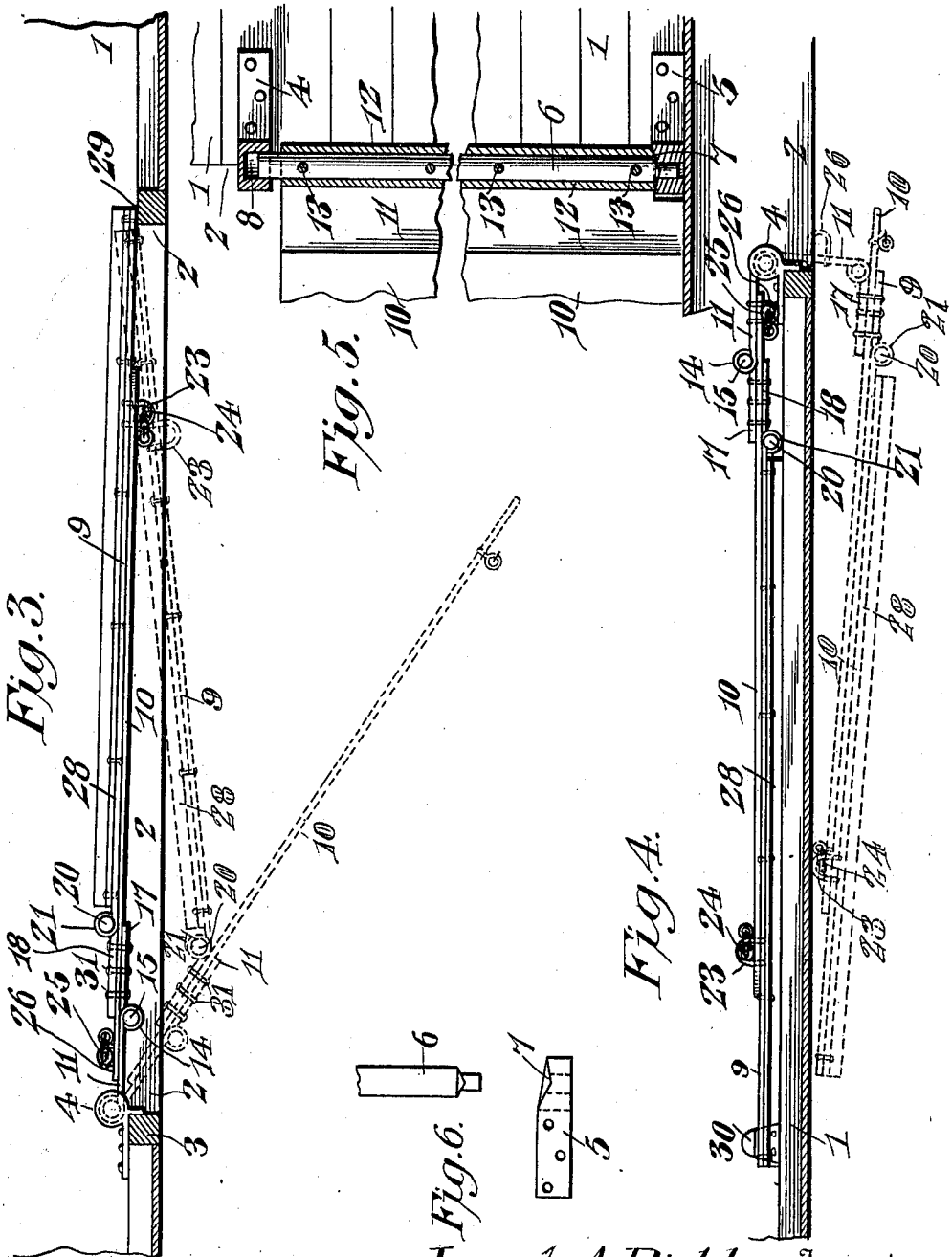

Fig. 3.

Fig. 5.

Fig. 4.

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOSEPH A. RICHLEY, OF MINNEAPOLIS, MINNESOTA.

GRAIN-CAR DOOR.

993,876. Specification of Letters Patent. Patented May 30, 1911.

Application filed April 4, 1910. Serial No. 553,322.

To all whom it may concern:

Be it known that I, JOSEPH A. RICHLEY, a citizen 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-Car Doors, of which the following is a specification.

This invention relates to grain car doors and has for its object the provision of a door of simple construction which may be readily opened and which, when not in position to close the door opening, may be folded and secured against either the inside or the outside of the car.

The invention also seeks to provide a door which may be readily fitted in place on any freight car now in use and which may be constructed at a slight expense and operated without requiring any excessive exertion on the part of the operator.

The invention also seeks to provide a door which, when extended across the door opening in closed position, will be held firmly in place by the pressure of the grain and which, when in the act of opening or closing, will automatically rise so as to clear the floor of the car.

These several objects, and such other objects as will hereinafter incidentally appear, are attained in such a device as is illustrated in the accompanying drawings, and the invention consists in certain peculiar features of the same as will be hereinafter first fully described and then more particularly defined in the claims.

In the drawings, which illustrate the preferred embodiment of my invention, Figures 1 and 2 are elevations of a grain car door showing the same in position in a car and extending across the door opening, Fig. 1 showing the door as it appears from the outer side of the car, and Fig. 2 showing the same as it appears on the inside of the car. Fig. 3 is a plan view of the door showing the same closed in full lines, and in dotted lines showing the movement of the parts to open the door. Fig. 4 is a similar view showing the door folded back against the inner side of the car in full lines, and in dotted lines showing the same folded against the outer side of the car. Fig. 5 is a detail vertical section through the hinge. Fig. 6 is a detail view of the hinge connection at the lower corner of the door.

The car body 1 is of the usual construction and provided with a door opening 2 in its side, as will be readily understood, and to the inner side of the body at the edge of the door opening and around the door post 3, I secure upper and lower sockets 4 and 5 adapted to receive a hinge rod 6 to which the door is secured so as to swing therewith. The lower socket 5 has its upper surface beveled around its central opening, as shown at 7, and the upper socket 4 has a central recess 8 in which the upper end of the hinge rod is slidably held, as shown in Fig. 5. The door is composed of three members or leaves 9, 10 and 11, which will be designated the main, the intermediate, and the hinge sections, respectively. The hinge leaf or section 11 has it inner edge formed into a hinge sleeve 12 which fits around the hinge rod 6 between the sockets 4 and 5 and is secured to the said rod by rivets or bolts 13 inserted diametrically through the same. The lower end of this hinge sleeve 12 is beveled to correspond to the beveled portion 7 of the socket 5 and bears directly against the said beveled portion or surface 7 so that when the member or leaf is rotated, the said beveled surfaces will impart a vertical movement to the hinge sleeve and its attached hinge rod and thereby lift the door slightly so that it will clear the floor of the car and will not drag thereon in the opening and closing movements. The hinge section 11 is provided at its outer edge with tubular offsets 14 through which a pintle or pin 15 is inserted, and the said pintle or pin 15 passes through corresponding sleeves or offsets 16 formed on the edge of a hinge plate 17 which is secured rigidly to the outer face of the intermediate section of the member 10 of the door. This intermediate section or member 10 is also secured rigidly to a hinge plate 18 which is disposed in rear of the said section, parallel with and immediately in rear of the hinge plate 17 and is provided with tubular offsets 19 which receive a pintle or pin 20 passing through tubular sleeves or offsets 21 formed at the inner edge of the main section or member 9 of the door, the said hinge plates and the intermediate leaf being secured together by the same sets of rivets 31.

It will thus be seen that the hinge section or leaf is hingedly secured to the door post 3, while the intermediate section is hinged to the hinge section and the main section is hinged to the intermediate section.

In order to provide for rigidity in the door when the same is in its closed position, the intermediate leaf or section is provided at or near its outer end with a slot 22 through which projects a staple 23 on the outer side of the main leaf or member, and a pin 24 is carried by the said intermediate leaf or section and adapted to be inserted through the said staple 23 and thereby prevent the intermediate leaf swinging outward away from the main leaf, as will be readily understood. In like manner, the inner end of the intermediate leaf is secured to the hinge leaf by a pin 25 carried by the said intermediate leaf and adapted to be inserted through a staple 26 projecting from the inner side of the hinge leaf through a slot 27 in the intermediate leaf, as will be readily understood. The main leaf 9 of the door is, of course, the full height desired for the door and the hinge leaf is of the same height, while the intermediate leaf is of equal height with the other leaves at its inner end and the three leaves consequently present a complete closure for the door opening when extended across the same as shown in Figs. 1 and 2, but, in order to avoid undue weight in the door, and to reduce the cost, the intermediate leaf is tapered toward its outer end as clearly shown in Fig. 1, while the main leaf, in order to assure the requisite strength, is provided with a reinforcing rib or bar of angle iron 28 secured along its medial horizontal line on its inner side, as shown.

Having thus made known the construction and arrangement of the several parts of my improved grain car door, the operation and advantages of the same will, it is thought, be readily understood and appreciated. When the door is in its closed position, the free end of the main leaf will extend slightly beyond the side of the door opening and will bear against the door post, as indicated at 29 in Fig. 3. The pressure of the grain, or other commodity with which the car is loaded, against the door will, consequently, hold the same against the side of the car so that accidental opening of the door will be positively prevented. The pin 24 may be guarded against pilferers or accidental displacement by means of any of the well-known forms of seals or otherwise secured, as will be readily understood, so that the removal of the contents of the car prior to its arrival at its destination will be prevented. When it is desired to unload the car, the pin 24 is disengaged from the staple 23 and the intermediate leaf 10 is then swung outward, as indicated by dotted lines in Fig. 3, around the hinge rod 6 and this movement will cause the main leaf 9 to swing upon the pin or pintle 20 relatively to the intermediate leaf so that the free end of the said main leaf will be drawn from its engagement with the door post and may be swung outward beyond the side of the car, as will be readily understood. As the door is swung outward, the beveled surfaces of the lower socket and the hinge sleeve 12 will impart a slight vertical movement to the door so that the lower edge of the same will be lifted from the floor of the car and the swinging movement of the door facilitated. The wagons into which the contents of the car are to be loaded may be backed close against the side of the car so that when the door is opened, the grain or other commodity will flow directly into the wagon and consequently loss of the same will be avoided. When it is desired to fold the door against the outer side of the car so that it will be out of the way while loading or unloading, the pin 25 is released from a staple 26 and the main and intermediate leaves will then turn upon the pin 15 as a center, while the hinge leaf will continue to swing upon the hinge rod as a center so that the several parts will assume the position shown in dotted lines in Fig. 4 and fold around the side of the door opening and against the side of the car, as will be readily understood. Should it be desired to ship the car empty and to have the door against the inner side of the car body, the pins 24 and 25 may be both inserted through their respective staples and the door swung bodily around the hinge rod so as to lie against the inner side of the door and be held in that position by any convenient form of door stop 30 on the floor of the car, as will be readily understood.

It will be noted that the hinge sleeve 12 fits closely against the corner of the door post 3 so that in all positions of the door, there will be no space between the same and the said post to permit the escape and loss of the grain. The door will swing easily and smoothly into any of its positions and will possess the minimum weight for the necessary strength. The socket 4 will be so disposed that it will receive the upper end of the hinge rod and maintain the said rod in its desired vertical position while at the same time it permits the vertical movement of the said rod without allowing the rod to escape from its sockets and thereby render the door inoperative or useless. The several leaves of the door are preferably constructed of sheet steel so that while they will be very light, they will at the same time be very strong, and when in the closed position will extend completely across the door opening and thereby retain the entire contents of the car within the same.

The advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. The combination with a car having a door opening, of a hinge rod mounted immediately adjacent to one side of the door opening and rotatable about its longitudinal axis in its mounting, and a door consisting of a hinge member secured to and movable with said hinge rod and also constituting a portion of the closure for the door opening, an intermediate member hinged to the first named member at the edge thereof remote from the hinge rod, and a main member hinged to the intermediate member in spaced relation to its connection with the hinge member and adapted to bear against the inner side of the car at the opposite side of the door opening from the hinge rod, the intermediate member overlapping both the main and hinge members and where bridging the space between them constituting a closure for the corresponding portion of the door opening.

2. A grain car door consisting of a hinge member, an intermediate member hinged thereto and overlapping the same, a main member hinged to and overlapping the intermediate member, and means for locking the intermediate member to the hinge member and to the main member respectively.

3. A grain car door having an intermediate closure member and end closure members, the intermediate member having portions each overlapping a respective one of the end members, and the intermediate member also having hinge connections to said end members at spaced points on opposite sides of said intermediate member.

4. The combination, in a grain car door, of a hinge member, a hinge plate disposed adjacent the outer edge of the hinge member and pivotally connected thereto, an intermediate member arranged against the inner side of said hinge plate, a second hinge plate arranged against the inner side of said intermediate member, both said hinge plates being permanently secured to the intermediate member, and a main member pivotally attached at its inner end to the last mentioned hinge plate and bearing against the inner side of the intermediate member.

5. A grain car door having a main closure member, a hinge member also constituting a closure member of equal height with the main member and spaced therefrom, and an intermediate member spanning the space between the other two members and overlapping and hinged to both of said members, the intermediate member where spanning the other two members being of equal height therewith and constituting a closure member.

6. A grain car door having a main closure member, a hinge member also constituting a closure member of equal height with the main member and spaced therefrom, and an intermediate member spanning the space between the other two members and overlapping and hinged to both of said members, the intermediate member where spanning the space between the other two members being of equal height with the latter and constituting a closure member, and fastening means for securing together the respective overlapping portion of the intermediate member to the main member and the respective overlapping portion of the intermediate member and the hinge member.

7. The combination with a car having a door opening, of a hinge rod rotatably mounted immediately adjacent the door opening, and a door having a hinge member rigidly secured to the hinge rod and passing between the same and the side of the car to fit closely against the side of the door opening, an intermediate member hinged to the hinge member, a main member hinged to the intermediate member and having its free end adapted to bear against the inner side of the car at the far side of the door opening, and means for locking the main and hinge members to the intermediate member, the main and hinge members being hinged to the intermediate member on opposite sides thereof and at points spaced apart longitudinally of the same whereby the door may be bowed in the door opening or may be secured close against either the inside or the outside of the car at one side of the door opening.

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

JOSEPH A. RICHLEY.

Witnesses:
NORMAN E. PETERSON,
ELIONORE HANSON.