J. H. FURTNEY.

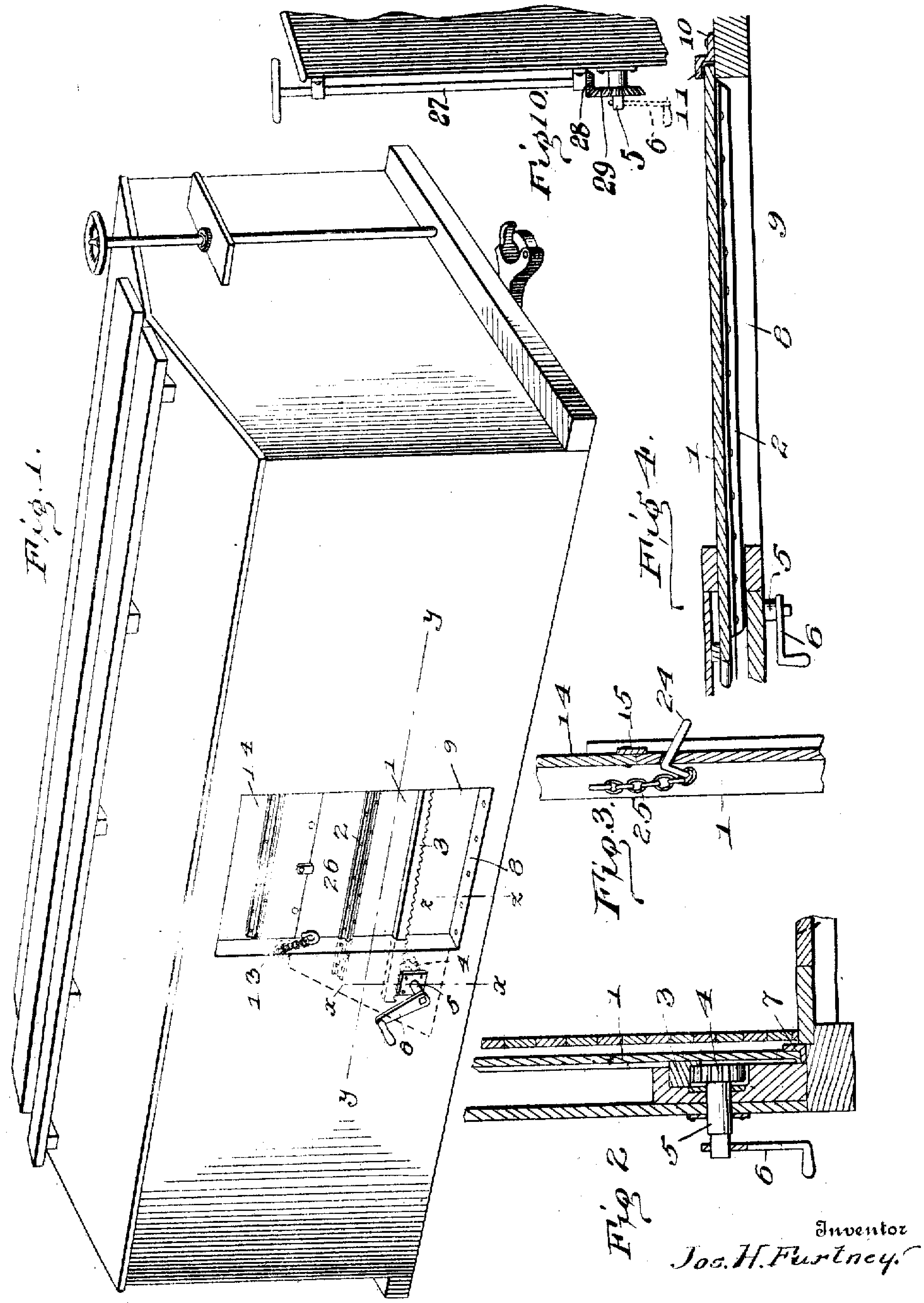
GRAIN DOOR.

APPLICATION FILED APR. 30, 1908.

908,086.

Patented Dec. 29, 1908.

2 SHEETS—SHEET 1.



Witnesses

Inventor
Jos. H. Furtney.

By Attorney

J. H. FURTNEY.

GRAIN DOOR.

APPLICATION FILED APR. 30, 1908.

908,086.

Patented Dec. 29, 1908.

2 SHEETS—SHEET 2.

Fig 5

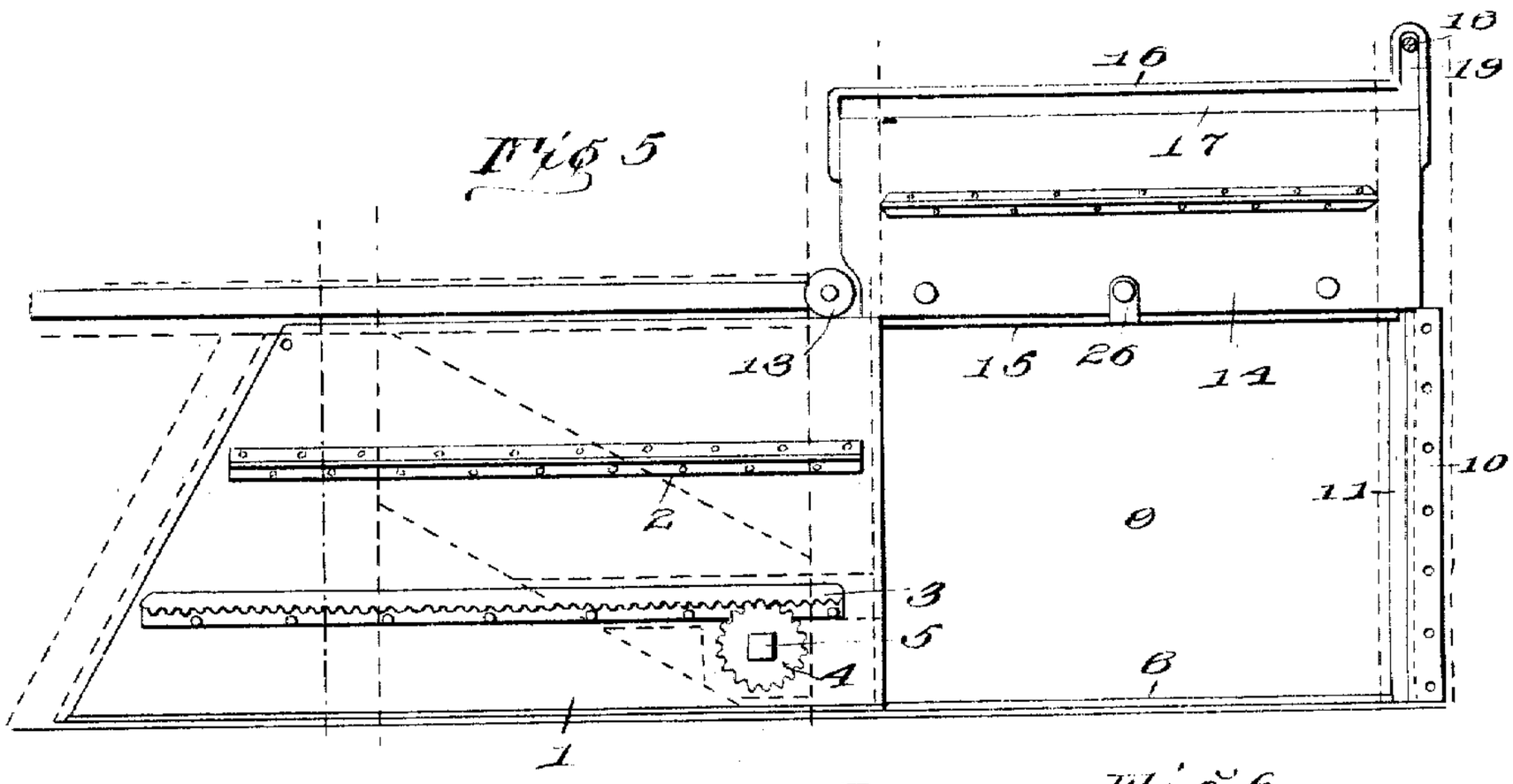
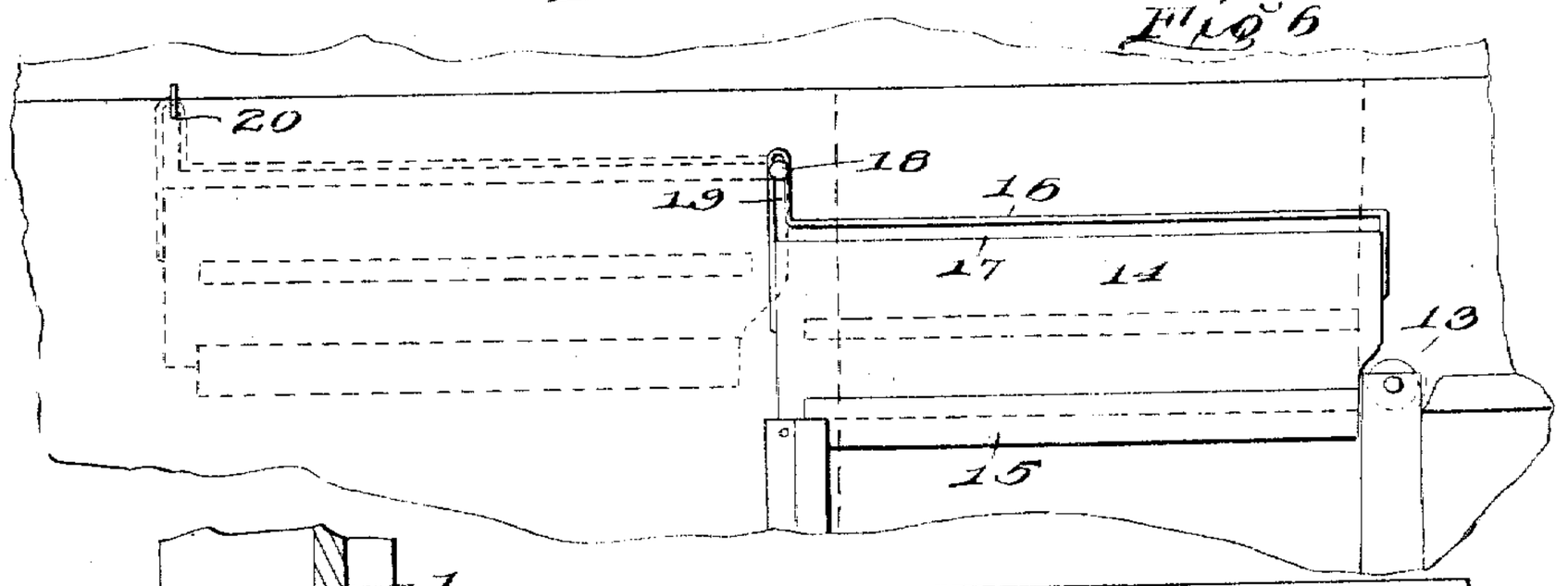


Fig 6



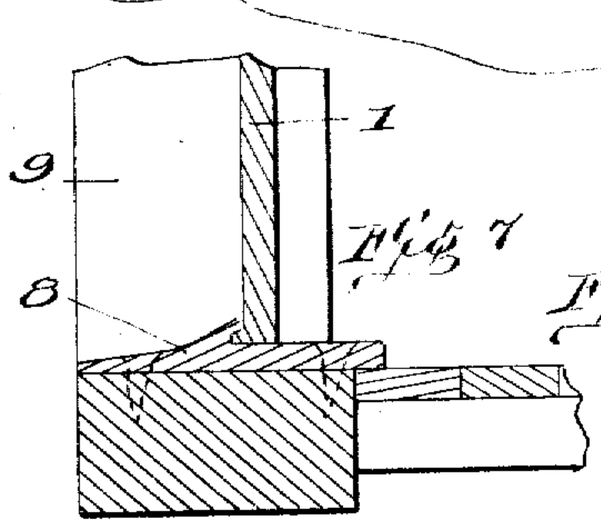


Fig 7

Fig 8

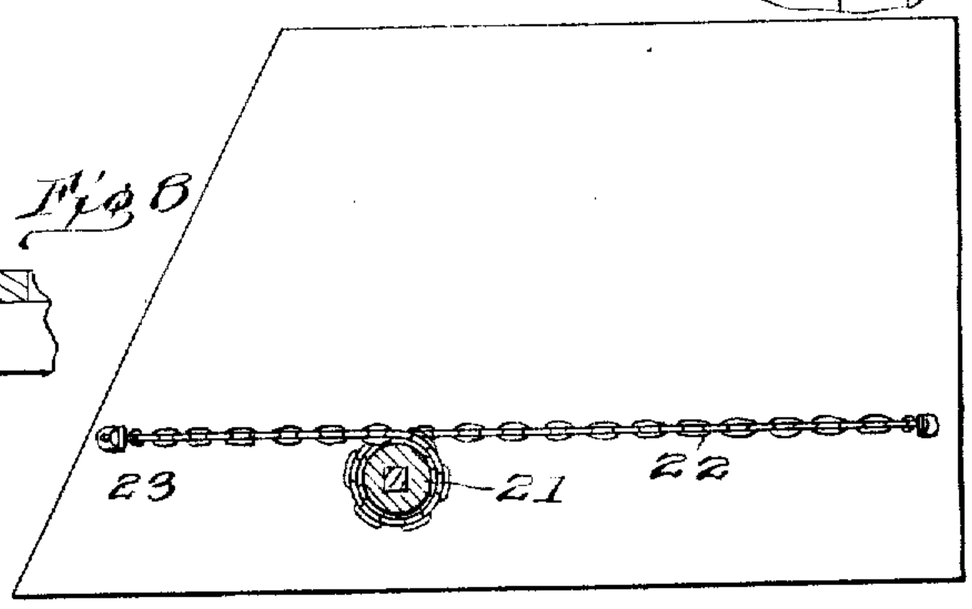
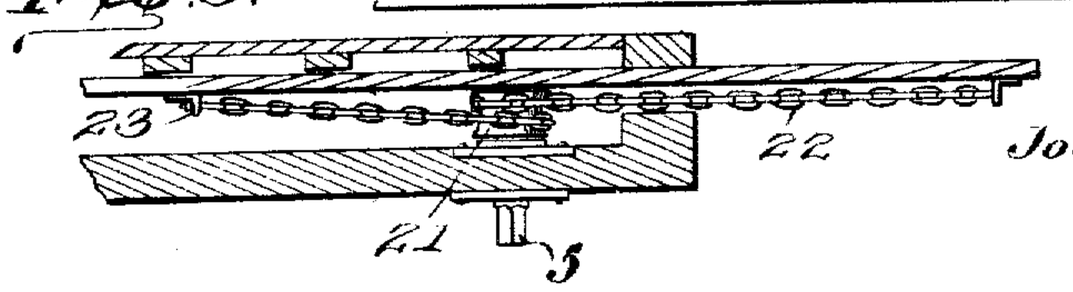


Fig 9.



Witnesses

Inventor

Jos H Furtney.

By

Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH H. FURTNEY, OF GLENWOOD, MINNESOTA.

GRAIN-DOOR.

No. 908,086. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed April 30, 1908. Serial No. 430,168.

To all whom it may concern:

Be it known that I, JOSEPH H. FURTNEY, a citizen of the United States, residing at Glenwood, in the county of Pope and State of Minnesota have invented certain new and useful Improvements in Grain-Doors, of which the following is a specification.

The present invention relates to closures for protecting the openings in the sides of box or grain cars and aims to provide a door which may be positively and easily operated both to close the opening and to expose the same as the car is to be loaded or unloaded.

The invention combines with a longitudinally slidable door means for positively moving the same in each direction, such as cog gearing or the substantial equivalent, a pulley and a cable or chain.

The invention also contemplates a supplemental door for closing the space above the main door, said supplemental door being mounted in a novel manner and supplied with indicating means coöperating with the main door and door frame to hold it securely when in operative position.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a perspective view of a box or grain car provided with a door embodying the invention. Fig. 2 is a sectional view on the line *x*—*x* of Fig. 1. Fig. 3 is a sectional view showing the pin in position for holding the door closed. Fig. 4 is an enlarged horizontal section on the line *y*—*y* of Fig. 1. Fig. 5 is a view in elevation showing the main door open and the supplemental door in position. Fig. 6 is a front view, the full lines showing the supplemental door closed, and the dotted lines the position of the supplemental door when open. Fig. 7 is a sectional view on the line *z*—*z* of Fig. 1, showing the parts on a larger scale. Fig. 8 is a modification showing a pulley and chain for sliding the door. Fig. 9 is a horizontal section of the modification shown in Fig. 8, illustrating a portion of the box into which the door slides. Fig. 10 is a modification.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The door may be applied to any type of box or grain car and may be constructed of any suitable material either of metal or wood, or a composition of such materials. In the preferable construction both the main and supplemental doors are formed of plate metal of proper gage and stiffened and braced in any suitable way. The main door 1 is arranged to slide in a pocket or space formed between the wall of the car and the framework and is thereby protected and out of the way when opened. Being of sheet metal, the door occupies a minimum amount of space, hence the pocket provided to receive the door when opened may be exceedingly narrow, thereby not materially diminishing the capacity of the car. Longitudinal bars 2 may be secured to the door to stiffen, strengthen and brace the same. A rack bar 3 is also secured to the door and extends lengthwise thereof and a gear wheel 4 has its teeth in mesh therewith to effect positive movement of the door in either direction upon turning said gear wheel upon its axis. A shaft 5 mounted in bearings provided at one side of the car, has the gear 4 fast thereto and is adapted to receive a crank handle 6 upon its outer end which projects from the side of the car a short distance for this purpose. A metal plate 7 is secured to the upper side of the sill of the car and forms a bracket for the door 1 to travel upon. This plate projects into the pocket into which the door slides a sufficient distance to form a support for said door. A second plate 8 is secured to the upper side of the sill between the jambs of the door opening 9, and said plate is of such construction and arrangement as to have its inner longitudinal edge in a higher plane than the plate 7 so as to form a shoulder for the lower edge of the door to abut against when closed, and thereby resist pressure upon the inner side of the door to prevent outward displacement thereof. A vertical bar or plate 10 is secured to the inner side of the door jamb against which the door closes and provides a space to receive the outer end of the door when closed. As shown, the vertical plate 10 has its outer portion off-set and bent to provide a keeper 11 which is adapted to

overlap the outer end of the door when closed and confine the same between the inner side of the jamb 12 and the said keeper 11. A guide wheel 13 is located at the upper outer corner of the pocket in which the door 1 slides and is arranged to engage with the upper edge of the door to prevent binding of the same and facilitate the sliding movements of the door when opening and closing the same.

A supplemental door 14 is adapted to close the space above the main door when the latter is closed and is adapted to rest upon the upper edge of said grain door. A metal strip 15 is secured to the lower edge of the door 14 upon the inner side and projects a short distance below said edge to overlap the upper edge of the main door and thereby securing close joint between the two doors, as also to prevent outward movement of the supplemental door when pressure is brought to bear upon the inner side thereof. The supplemental door is of a length to enable its end portions to engage with the inner sides of the door jambs. A rod or bar 16 is secured at its ends to opposite ends of the door 14 and is spaced a short distance from the upper edge of the door to form a guide slot 17 in which a headed fastening 18 secured to the jamb 12 operates. The rod or bar 16 is bent at one end to form a vertical loop 19, which admits of the door 14 having a drop when closed so as to rest upon the main door. The loop 19 also forms suspending means for the inner end of the door when the latter is open, said loop being adapted to engage a hook 20 provided upon the inner side of the car near the top thereof to receive the same. When the supplemental door is closed, its lower corners engage the confining means of the main door, such as the keeper 11 and the upper corner portion of the aforementioned pocket. In the modification shown in Figs. 8 and 9, a pulley 21 is fast to the shaft 5 and receives a chain or cable 22 which is connected at opposite ends to end portions of the door 1, said chain or cable 22 making a turn around said pulley so as to insure sufficient engagement to cause positive sliding movement of the door in each direction upon rotating said shaft in one or the other direction. A tightening device 23 is provided at one end of the chain or cable 22 to take up slack and insure proper engagement of said chain or cable with the pulley. The construction just described is preferable in some instances to the rack and gear wheel, but is the mechanical equivalent thereof. When the door is closed, it is secured by means of a pin 24 passed through an opening of said door and adapted to engage with the jamb at the outer end of the pocket in which the door slides. A chain or like connection 25 is fast to the pin and is secured to the car, thereby preventing loss or misplacement of the pin. To prevent inward displacement of the supplemental door, a clip 26 is attached to the lower edge and overlaps the outer portion of the door 1.

It is desirable to provide for operating the door from the top of the car so that the brakeman may pass from one car to another both to set or release the brakes and to open or close the grain door and thereby obviate the necessity of climbing upon and climbing down each car in succession to effect this result. For this purpose, the construction shown in Fig. 10 is provided, the same consisting of a vertical shaft 27 mounted in bearings at one side of the car and having a hand wheel at its upper end and provided at its lower end with a gear wheel 28 in mesh with a gear wheel 29 mounted upon the shaft 5.

Having thus described the invention, what is claimed as new is:

In combination with a car having a door opening, a longitudinally slidable door for closing said opening, a supplemental door adapted to rest upon the main door and provided at its lower edge with a strip to overlap the upper edge of the main door upon the inner side, a rod secured at opposite ends to end portions of the supplemental door and spaced from the upper edge of said supplemental door, and provided at one end with a vertical loop to admit of the door having a drop, a headed fastening applied to a jamb of the door opening and operating in the space formed between said rod and the upper edge of the supplemental door, and a suspending device to engage with the aforesaid vertical loop to support the door when open.

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

JOSEPH H. FURTNEY. [L. S.]

Witnesses:

HENRY T. RONNING,

MAE NELSON.