July 16, 1929. H. I. HAKE 1,721,112

GRAIN CAR DOOR

Filed July 24, 1928 2 Sheets-Sheet 1

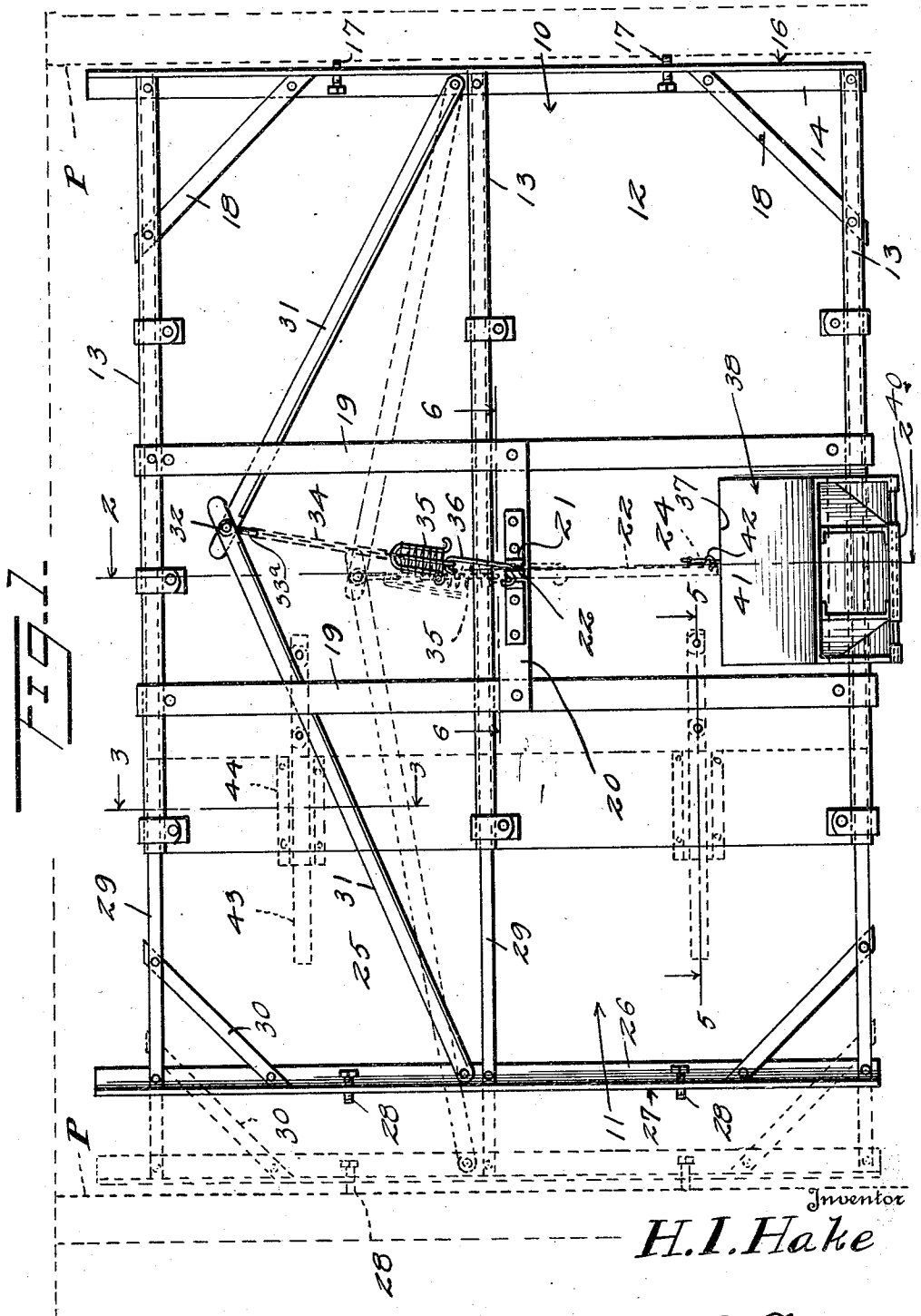


Fig. 1.

Inventor
H. I. Hake

By Watson E. Coleman
Attorney

July 16, 1929. H. I. HAKE 1,721,112

GRAIN CAR DOOR

Filed July 24, 1928 2 Sheets-Sheet 2

Fig. 2.

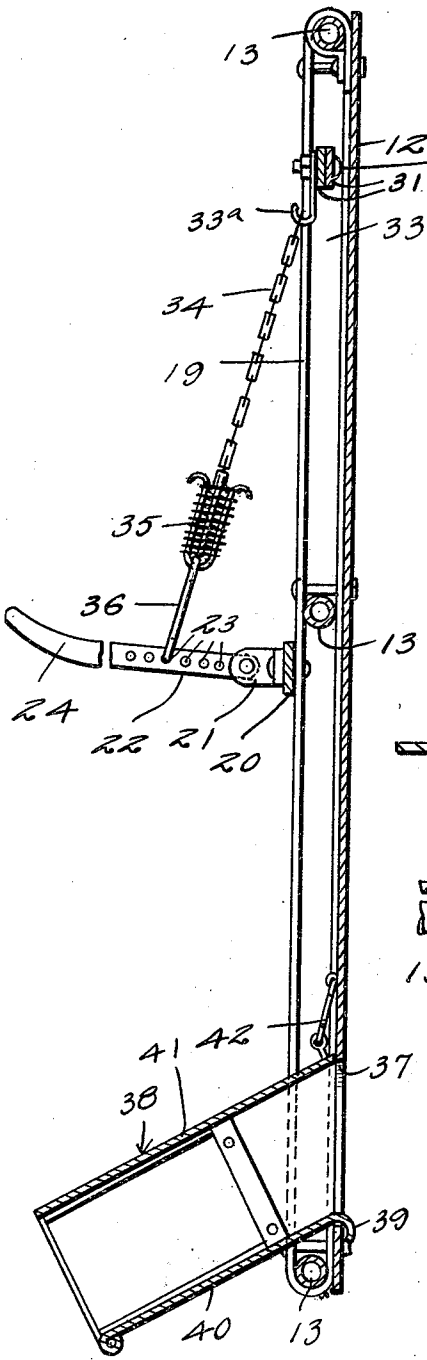


Fig. 3.

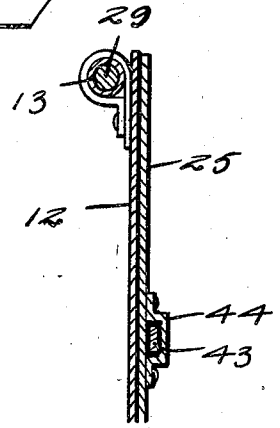


Fig. 4.

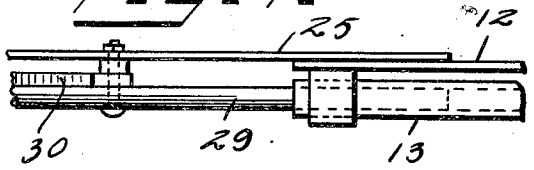


Fig. 5.

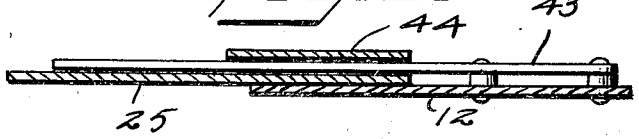
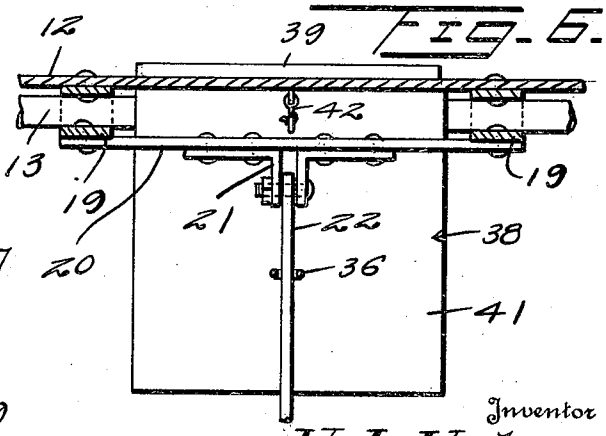


Fig. 6.



Inventor

H. I. Hake

By Watson E. Coleman

Attorney

Patented July 16, 1929. 1,721,112

UNITED STATES PATENT OFFICE.

HENRY I. HAKE, OF TIPTON, KANSAS.

GRAIN-CAR DOOR.

Application filed July 24, 1928 Serial No. 294,983.

This invention relates to grain car doors for use with railway cars and more particularly to a temporary door for installation in the railway car door outwardly of the ordinary grain car door to hold the grain while permitting removal of the sections of the main grain door without the necessity of destroying the same.

An important object of the invention is to produce a device which is capable of use with various types of grain car doors without regard to the distance between the door posts between certain limits and which may be very readily inserted and removed.

A further object of the invention is to provide an extensible door having means whereby it may be securely held in its closed position without regard to the extent to which it is expanded.

A still further object of the invention is the production of an extensible door of this character which may be readily and cheaply manufactured, which will be durable and efficient in service and a general improvement in the art.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a front elevation of a temporary grain car door constructed in accordance with my invention;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a fragmentary plan view thereof;

Figure 5 is a section on the line 5—5 of Figure 1;

Figure 6 is a section on the line 6—6 of Figure 1.

Referring now more particularly to the drawings, the door is formed in two sections 10 and 11, hereinafter referred to as the main and auxiliary sections. The section 10 comprises a metal sheet 12 preferably comprising galvanized tin of about twenty gauge having secured thereto at the edges thereof and at its center tubular reinforcing bars 13. At one edge of the sheet, these reinforcing bars and the sheet 12 are secured to one flange 14 of the vertical angle bar, the other flange 16 of which has directed therethrough set-screws 17, the purpose of which will presently appear. The upper and lower tubular bars 13 are preferably connected to this angle bar by angular braces, designated at 18. Adjacent the opposite edge of the sheet, the tubular bars are connected by spaced vertical braces 19, each of which is in the form of a piece of strap iron bent to form a loop through which the upper and lower tubular bars are passed. These braces about midway the height thereof are connected by a transverse bracket 20 from which extends outwardly a pivot bracket 21, to which is pivoted a lever 22 having adjacent its pivot a plurality of openings 23. The outer end of this lever is formed as a handle 24, by means of which it may be manipulated.

The auxiliary section 11 comprises a sheet 25 similar to the sheet 12, to the outer edge of which is secured one flange 26 of an angle bar 27, the other flange of which has set-screws 28 directed therethrough. To this angle bar are secured the ends of rods 29 corresponding in number and arrangement to the tubular bars 13. The upper and lower rods are braced by angular braces 30, the inner ends of which engage the rods and are secured thereto and to the sheet. These braces are inserted between the rods and the sheet, so that the surface of the sheet is spaced from the face of the rods. The sheet 25 overlaps the sheet 12 and the rods 29 are slidably engaged in the tubular bars 13.

Pivotally connected to the angle bars 27 and 16 immediately above the central bar 29 and the central tubular rod 13 are the ends of toggle links 31, the inner ends of which are pivotally connected to one another, as at 32. These links extend through and operate in the slots 33 formed between adjacent runs of the intermediate vertical braces 19. The pivotal connection between the toggle links 31 provides a mounting for a hook 33^a with which may be engaged a selected link of a chain 34. The opposite end of this chain is connected to one end of a tension spring mechanism 35, the opposite end of which is in turn connected to a hook element 36 adapted to be selectively engaged in an opening 23 of the lever 22.

It will be noted that the pivotal connection of the lever 22 is offset outwardly from the face of the sheet 12 as respects the hook 36 to which the chain is adapted for connection,

so that if the connection between the hook 36 and lever 22 is under strain when the lever is vertically disposed and lies against the face of the sheet, this strain will tend to move the lever toward the sheet which, of course, acts as a check for its motion, so that the strain is held.

It will also be obvious that a downward strain of the pivotal connection between the toggle links will tend to urge the auxiliary section 11 outwardly, so that if the device is arranged between door posts, this strain will force the angle bars into engagement with the door posts and maintain the door in position therein. The set-screws will assist in preventing side slip of the door when applied.

In inserting the door, the toggle links are preferably pulled downward until the door is firmly engaged after which the lever may be elevated and the connection of the chain 34 with the hook 33ª altered, so that when the lever is again forced downwardly to its vertical position, the full strain of the spring 35 will be acting upon the toggle links to urge them into alignment with one another and accordingly acting to spread the sections of the door and cause a tighter fit between the angle irons and the door posts P of the car. The sheet 12 adjacent its bottom and preferably between the vertical braces 19 is formed with an opening 37 and a detachable spout 38 is preferably provided for engagement with the edges of these openings. In the present construction, this spout is shown with a curved lip 39 upon the lower wall 40 adapted to engage over the lower edge of the opening and the upper wall 41 of the spout and sheet 10 are shown as provided with coacting fasteners 42 for holding the upper end of the spout in engagement.

To further assist in maintaining the sheets 12 and 25 in proper engagement with one another, the sheet 12 has preferably secured to the rear face thereof, as designated at 43, bars which slidably engage the rear face of the sheet 25. The sheet 25 has secured thereto guides 44 through which these bars are slidably directed.

It will be obvious that with a construction of this character, the auxiliary door may be very readily inserted and when it is in position, the main grain door can be removed a section at a time without destroying the boards from which it is formed.

It will also be obvious that the construction hereinbefore set forth is capable of a certain range of change and modification without materially departing from the spirit of the invention and I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In a temporary grain car door and in combination, slidably connected door sections, links each connected at their outer ends to one of the door sections and at their inner ends to one another and swinging in a plane paralleling the door sections to widen or contract the door, and a spring connected at one end to the links and at the other to a member secured to one of the door sections for urging the links into alignment with one another.

2. In a temporary grain car door and in combination, slidably connected door sections, links each connected at their outer ends to one of the door sections and at their inner ends to one another and swinging in a plane paralleling the door sections to widen or contract the door, and a spring connected at one end to the links and at the other to a member secured to one of the door sections for urging the links into alignment with one another, said member comprising a lever pivotally connected to the door and shiftable about the pivot thereof to increase or decrease the tension of the spring.

3. A device as claimed in claim 2, wherein the structure includes a part limiting movement of the lever in a direction to tension the spring and the spring connection between the lever and the links bears such relation to the pivot of the lever, when the lever is engaged with said part, that the lever is urged toward the means by the tension of the spring.

4. In a temporary grain door for cars, two slidably connected sections one of which has an opening for the reception of a spout and each of which has its outer edge adapted for engagement with the door post of a grain car, a pair of links each connected at its outer end with one of the sections and pivotally connected to one another at their inner ends, one of the door sections having guides in which the links operate, a pivoted lever and a connection between the lever and the links for urging said links into alignment with one another.

5. In a temporary grain door for cars, two slidably connected sections one of which has an opening for the reception of a spout and each of which has its outer edge adapted for engagement with the door post of a grain car, a pair of links each connected at its outer end with one of the sections and pivotally connected to one another at their inner ends, one of the door sections having guides in which the links operate, a pivoted lever, and a connection between the lever and the links for urging said links into alignment with one another, said connection being adjustable longitudinally of the lever.

6. In a temporary grain door for cars, two slidably connected sections one of which has an opening for the reception of a spout and each of which has its outer edge adapted for engagement with the door post of a grain car, a pair of links each connected at its outer end with one of the sections and pivotal-

ly connected to one another at their inner ends, one of the door sections having guides in which the links operate, a pivoted lever, and a connection between the lever and the links for urging said links into alignment with one another, said connection including a spring, the structure including a part limiting rotation of the lever in a direction to align the links with one another, said spring when the lever is engaged with said part constantly urging the lever toward said part.

In testimony whereof I hereunto affix my signature.

HENRY I. HAKE.