Aug. 30, 1955 O. E. GONZALES 2,716,536

DOOR JACK

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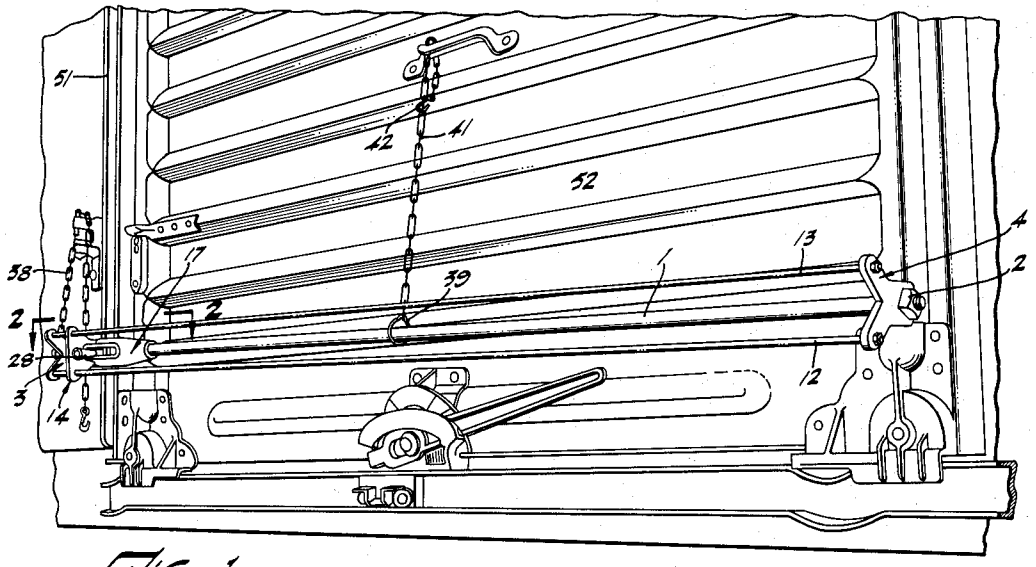


FIG. 1.

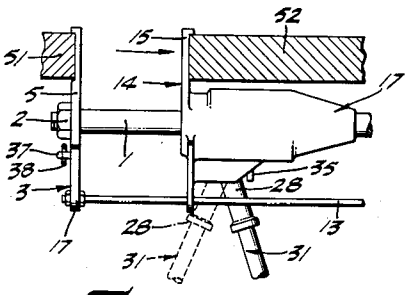


FIG. 2.

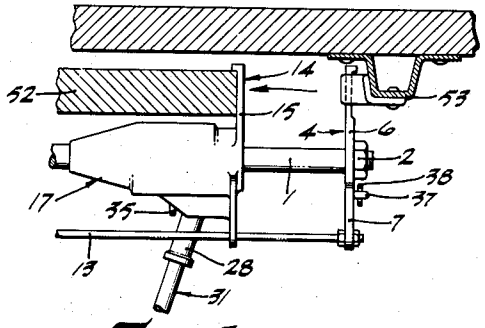


FIG. 3.

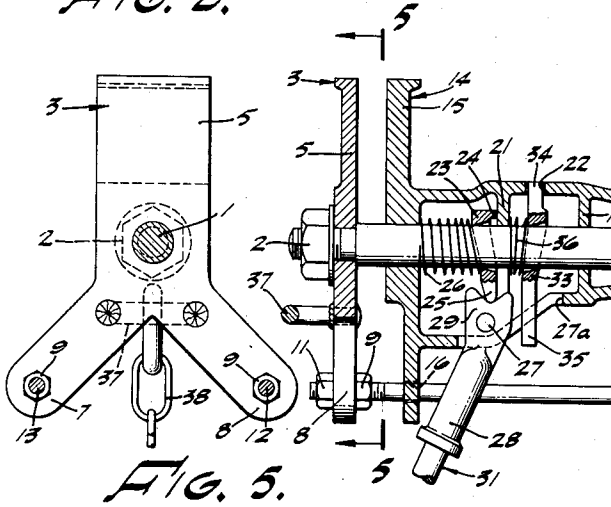


FIG. 5.

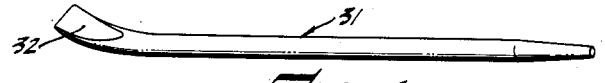


FIG. 6.

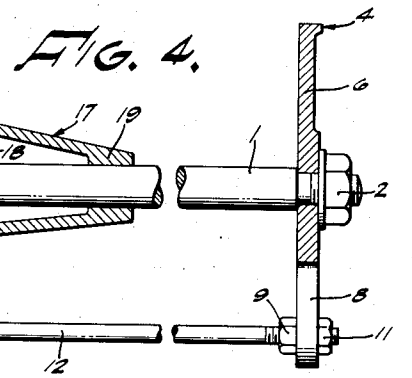


FIG. 4.

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DOOR JACK

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2 Claims. (Cl. 254—106)

This invention relates to and in general has for its object the provision of a jack or operator for closing and opening freight door cars and the like.

Although many types of door operators are currently in use, most of them are cumbersome and require two men to operate them.

More specifically, the object of this invention is the provision of a door opening jack including a rod or bar on which the jack mechanism proper is slidably mounted and wherein a pair of relatively light tie rods are provided in parallelism with the slide rod or bar for counteracting the bending moments to which the slide bar is subjected and for therefore preventing it from flexing. As a result of this construction, the slide bar as well as the tie rods can be made of relatively small cross-section and the weight of the entire mechanism can thereby be kept down to a point wherein it can be carried and manipulated by a single operator.

A further object of this invention is the provision in a door jack of the character above described of a simple novel inching mechanism for inching one of the pry plates of the device along the slide bar and including a pair of spring biased clutch rings disposed around the slide bar, one of these rings being operable by a lever pivoted to the jack housing.

The invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description where that form of the invention which has been selected for illustration in the drawings accompanying and forming a part of the present specification, is outlined in full. In said drawings, one form of the invention is shown, but it is to be understood that it is not limited to such form, since the invention as set forth in the claims may be embodied in other forms.

Referring to the drawings:

Fig. 1 is a fragmentary perspective view of a freight car and a door jack embodying the objects of my invention, the jack being shown in its operative position.

Fig. 2 is a horizontal section taken on the section line 2—2 of Fig. 1 showing my jack in use for opening a door.

Fig. 3 is a section similar to that illustrated in Fig. 2 but showing the jack in use for closing a door.

Fig. 4 is a vertical mid-section taken through the jack.

Fig. 5 is a vertical section taken on the section line 5—5 of Fig. 4, and

Fig. 6 is a perspective view of the jack operating handle.

As shown in these various figures, the objects of my invention have been embodied in a jack comprising a steel slide bar or rod 1 conveniently about one inch in diameter and 84 inches long and having threaded ends. mounted over the ends of the bar 1 and secured thereto by nuts 2 are fixed pry plates 3 and 4, each having transversely extending door or load engaging portions 5 and 6 and a pair of opposed tie rod supporting fingers 7 and 8.

Rigidly fastened to and between each longitudinally

opposed pairs of supporting fingers 7 and 8 by nuts 9 and 11 are tie rods 12 and 13 preferably of a diameter considerably smaller than the diameter of the slide rod 1.

Slidably mounted on the slide rod 1 intermediate the two fixed pry plates 3 and 4 is a slide rod 14 provided with a load engaging portion 15 in longitudinal alignment with the load engaging portions 5 and 6 of the fixed pry plates. The pry plate 14 as indicated in Fig. 4 is provided with a pair of holes 16 through which the tie rods 12 and 13 pass with positive clearance.

Formed integral with the intermediate pry plate 14 is an inwardly extending jack housing 17 provided with an intermediate slide rod bearing 18 and with an outer slide rod bearing 19. Extending into the housing 17 and formed integral therewith is a yoke 21 straddling the slide rod 1 and formed in the upper wall of the housing 17 intermediate the bearing 18 and the yoke 21 is an aperture 22. Surrounding the slide rod 1 intermediate the pry plate 3 and the yoke 21 is clutch ring 23 provided at its upper side with a fulcrum finger 24 and at its lower side with a depending lever arm 25. Surrounding the slide bar 1 with its ends in abutment with the pry plate 14 and the clutch ring 23 is a biasing compressing spring 26. Pivoted to the jack housing 17 by a pin 27 and extending through a slot is a hollow 27^a formed in the lower side of the housing operating lever 28 provided at its inner end with a fork 29 arranged to straddle the free end of the lever arm 25. Insertable in the hollow end of the operating lever 28 is a combination lever handle and pry bar 31 having a curved, wedged shaped outer end 32. Loosely surrounding the slide bar 1 between the yoke 21 and the bearing 18 is holding clutch ring 33 provided with a fulcrum finger 34 extending into the aperture 22 and formed on its lower side with a release finger 35 extending through the slot 27^a. Surrounding the slide bar 1 between the yoke 21 and the clutch ring 33 is a biasing spring 36.

Fastened to pry plate 3 by its U-bolt 37 is a chain 38 and slidable on the slide bar 1 is a ring 39 to which is fastened a supporting chain 41 terminating at its free end in a fastener 42.

To open a freight car door with this device the door is first pried open with a pry bar 31 to an extent sufficient to permit the fixed pry plate 3 and the slidable pry plate 14 to be inserted between the door jam 51 and the door 52 as illustrated in Fig. 2. The door opener is then suspended from wall 51 of the car and from the door 52 in a horizontal position by the two chains 38 and 41 as illustrated in Fig. 1. When in this position, the pry plates can be readily inserted in place between the door jam and the door and the door opened by reciprocating the lever 28.

Upon the initial movement of the operating lever in a counterclockwise direction from its position as shown in Fig. 4, the clutch ring 23 binds on and is locked to the slide bar 1, the clutch ring 33 is free to advance to the right on the slide bar and consequently the jack housing is caused to advance an increment to the right. It should here be noted that the forward movement of the housing is brought about by the same sort of action by which a rowboat is advanced through the water by a pair of oars and that in such action it is the free ends of the oars that can be considered as being fulcrumed at relatively fixed points in the water. Upon the initiation of the return or clockwise stroke of the lever 28, the clutch ring 33 takes a bite on the slide bar 1 and the clutch ring 23 is free to slide forwardly on the slide bar 1 under the influence of the biasing spring 26. In this manner the housing is inched to the right until the door is in its full open position.

If it is desired to close the door, the fixed pry plate 4

and slidable pry plate 14 are inserted between a stiffening channel 53 and the right side of the door 52 and the operation above described reversed.

From an inspection of Figs. 2, 3 and 4, it will be noted that since the door and jam contacting portions 5 and 15 of the pry plates 3 and 14 are located at an appreciable distance from the slide rod 1, these portions constitute lever arms and that consequently a couple is formed tending to make the outer ends of the contacting portions 5 and 15 diverge from each other. This in turn means that the slide bar 1 is subjected to a bending moment and in the absence of the tie rods 12 and 13, would have to be made of very heavy steel. It is to avoid this additional weight and expense that resort is had to the relatively light tie rods 12 and 13 and in to placing them at a point generally opposite the contacting portions 5 and 15 of the pry plates. By doing this, any bending moment to which the slide bar 1 is subjected is transmitted to the tie rods 12 and 13 to an extent which maintains the system in balance in so far as bending moments are concerned, at least to a point wherein for practical purposes the slide bar 1 is always substantially straight and the pry plates square therewith. The total weight of the entire device need not be over 34 pounds.

From the above description, it will be seen that I have provided a simple, inexpensive and positively acting freight car door opener, sufficiently light to be carried and manipulated by one operator.

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

1. A door jack comprising: a slide bar; a pry plate rigidly fixed to each end of said slide bar, and extending laterally therefrom, each of said pry plates including longitudinally aligned load engaging portions; a tie rod extending between and rigidly fixed to said pry plates in parallelism with said slide bar at the side thereof opposite said load engaging portions; a movable pry plate slidably mounted on said slide bar intermediate its ends; a jack housing formed integral with said movable pry plate and slidably mounted on said slide bar; and a lever operated inching device mounted within said housing.

2. A door jack comprising: a slide bar; a fixed pry plate rigidly secured to each end of said slide bar, and extending laterally therefrom, each of said plates including load engaging portions and said load engaging portions being longitudinally aligned; a pair of tie rods extending between and rigidly fixed to said fixed pry plates in parallelism with said slide bar on the side thereof generally opposite said load engaging portions; a movable pry plate slidably mounted on said slide bar and tie rods; a jack housing formed integral with said movable pry plate and surrounding said slide bar; and a lever operated inching device mounted within said housing for inching said housing and its associated pry plate along said slide bar.

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