Aug. 30, 1927. 1,640,411

F. J. JACKSON

JACK

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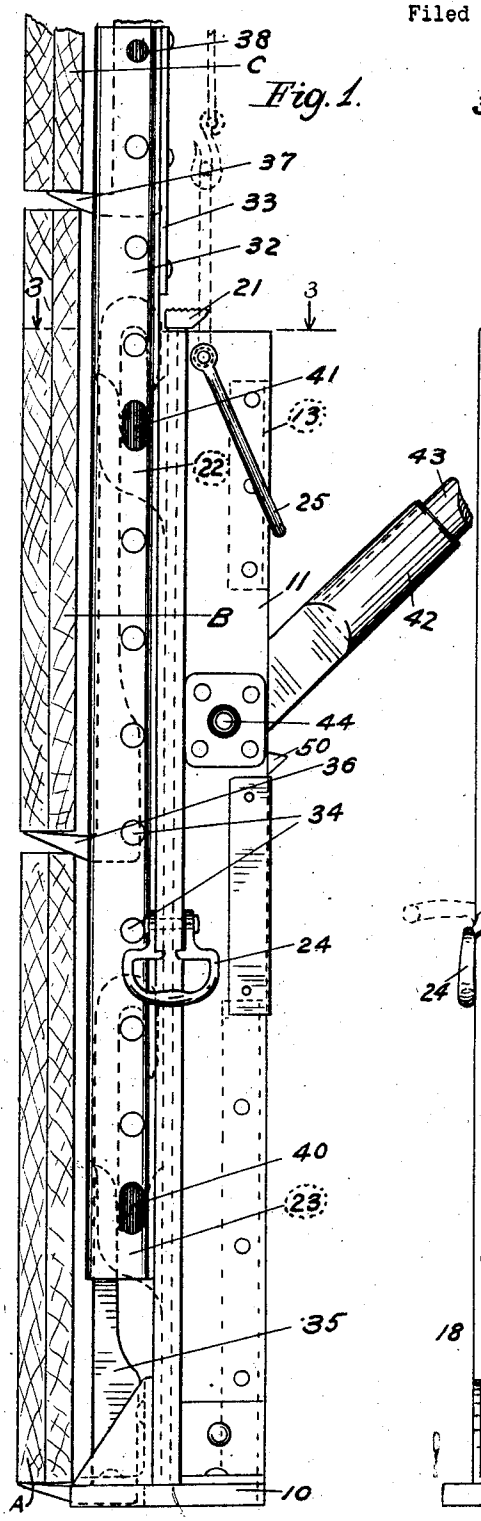


Fig. 1.

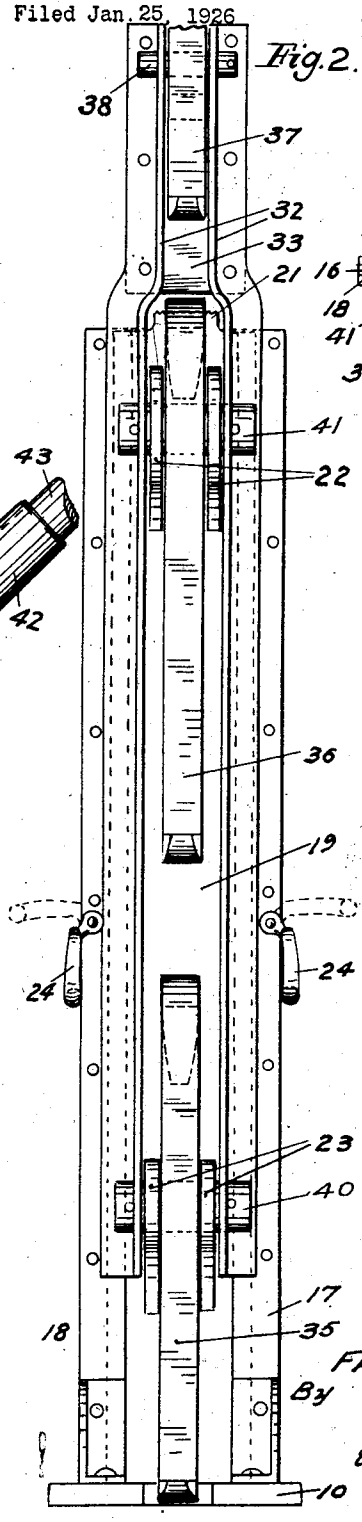


Fig. 2.

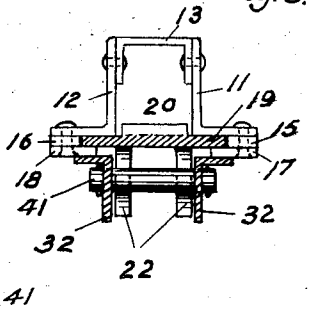


Fig. 3.

Inventor
FRED J. JACKSON
By
Attorney

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F. J. JACKSON

JACK

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Fig. 4.

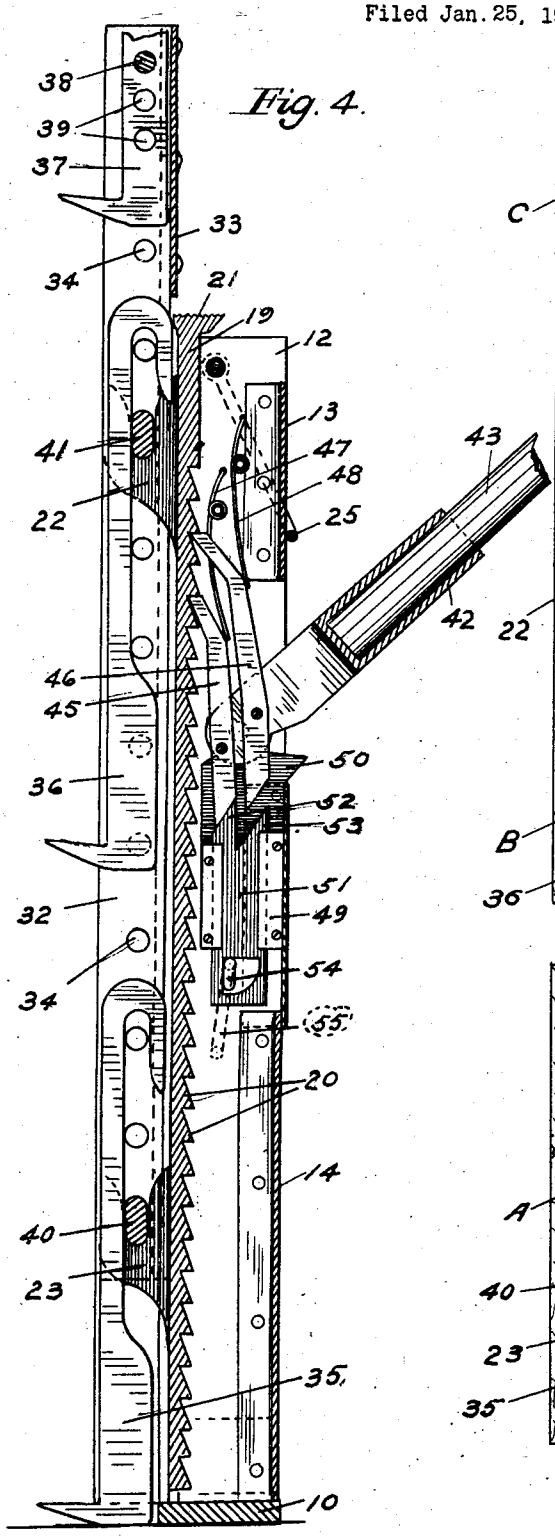
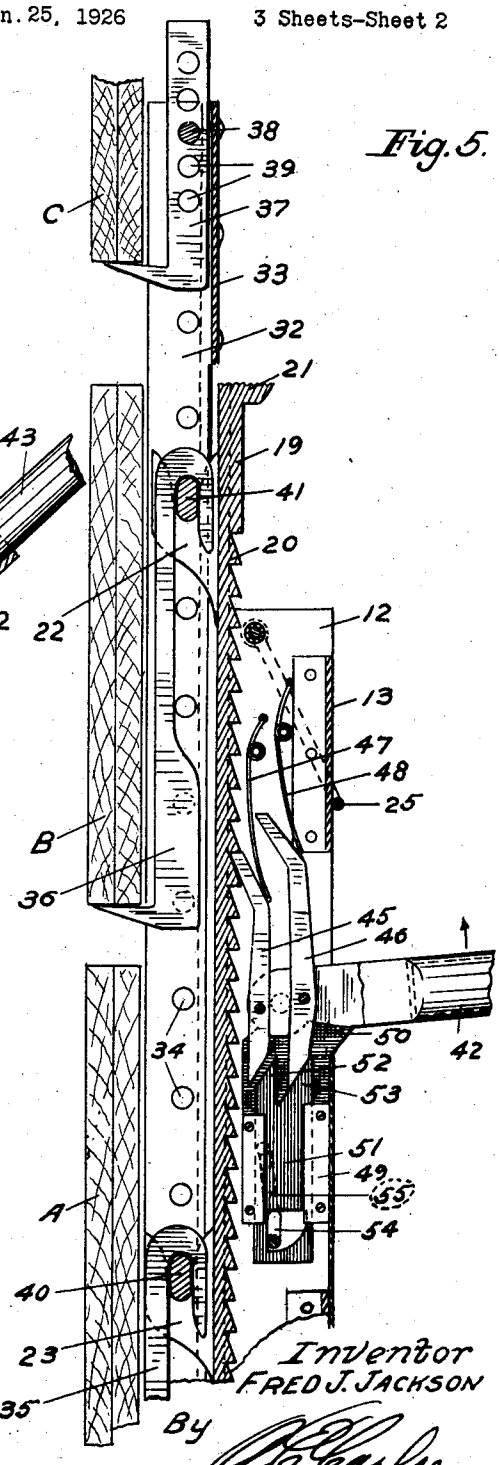


Fig. 5.



Inventor
FRED J. JACKSON
By
Attorney

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F. J. JACKSON

JACK

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Fig. 6.

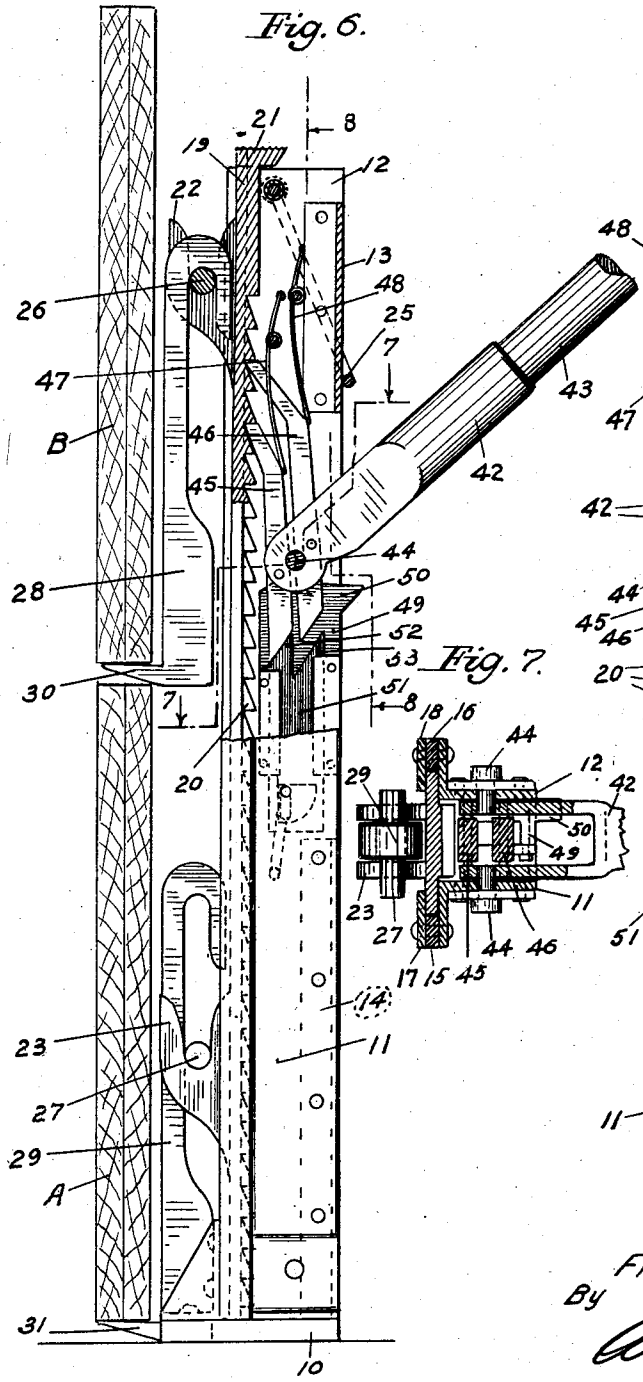


Fig. 7.

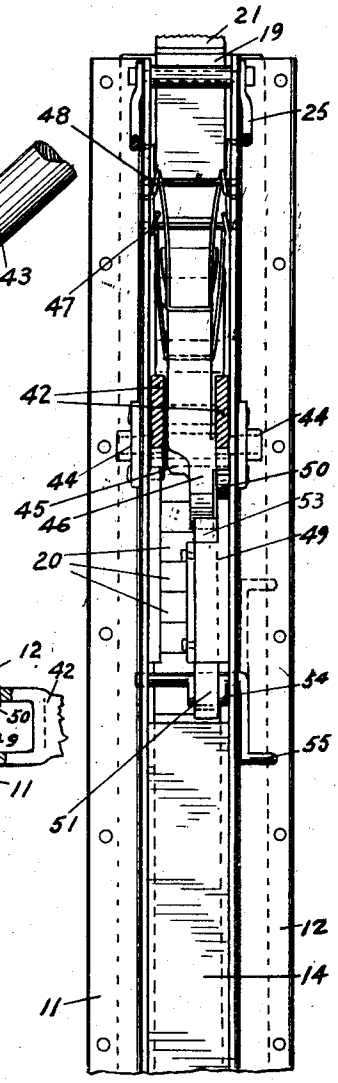


Fig. 8.

Inventor
FRED J. JACKSON
By
Attorney

Patented Aug. 30, 1927. 1,640,411

UNITED STATES PATENT OFFICE.

FRED J. JACKSON, OF MINNEAPOLIS, MINNESOTA.

JACK.

Application filed January 25, 1926. Serial No. 83,753.

This invention relates to lifting jacks and the primary object is to provide a highly novel, practical and efficient jack which is particularly adapted for use in opening grain car doors of the type in which transversely arranged sections are slidably secured in channels in the door frame. Such door sections, due to the internal pressure of the grain in the car, are almost always so tightly secured that it is impossible to remove them except by successively loosening and raising them with great pressure. In order to efficiently apply such pressure I have perfected the jack shown in the accompanying drawings, in which:

Fig. 1 is a side elevation of the jack, a portion of the lever handle and the upper end being broken away.

Fig. 2 is a rear or door side view of the jack as shown in Fig. 1.

Fig. 3 is a cross sectional view on the line 3—3 in Fig. 1.

Fig. 4 is a substantially central sectional elevation of the jack as shown in Fig. 1, the ratchet mechanism being adjusted for raising action.

Fig. 5 is a sectional elevation substantially similar to Fig. 4, but showing the ratchet mechanism as arranged for lowering action.

Fig. 6 is a side elevation of the jack, partly broken away, showing how it may be employed without the extension device shown in Figs. 1–5.

Fig. 7 is a sectional view as seen on the irregular line 7—7 in Fig. 6.

Fig. 8 is a sectional elevation on the irregular line 8—8 in Fig. 6.

Referring to the drawings by reference characters A, B and C designate the sections of a grain car door which are to be forced open or upwardly by my improved jack. When the door is fully closed these sections abut each other, and when it is to be open it is found most practical to loosen the sections by successively raising them apart from each other, before attempting to raise them all up to completely free all the grain, rather than to exert the tremendous force required to raise them all at once from their initial positions.

The jack comprises a base member 10, upon which is secured a standard consisting of a pair of spaced parallel angle iron members 11 and 12, rigidly connected by channel members 13 and 14. To the backs of the side flanges of the angle irons 11 and 12 are secured narrow vertical strips 15 and 16 and wider vertical strips 17 and 18, forming with the angle irons, inwardly opposed channels which slidably receive the sides of a rack member 19 having teeth 20. The upper end of this rack is provided with a head 21 which may be applied directly under any object to be raised. This rack is raised and lowered by a mechanism which will later be described. The sides of the jack are provided with handles 24, by which it may be carried, while a bail 25 is provided at its upper end by which it may be engaged by a hoist.

The back of the rack is provided with upper and lower pairs of hooks 22 and 23, adapted to carry removable pins 26 and 27 for releasable engagement with a pair of removable hooks 28 and 29, as shown in Fig. 6. These hooks have fingers 30 and 31 which engage, respectively, under the door sections B and A. To raise a door, with this construction, the fingers 30 and 31 are first driven under the respective doors so that the hooks 28 and 29 will be held in the respective positions shown in Fig. 6. The jack is then set in place with the lifting rack in a lowered position. As the rack is then lifted up the pin 26 first engages the hook 28, and thus moves the section B up from about four to eight inches before the lower pin 27 engages the hook 29 to lift the lower door section. Thus the sections will first be successively loosened before they are lifted completely upward together.

With doors having three or more sections, as in Figs. 1 and 5, I prefer to use an extension device which will enable sections above the jack proper to be engaged and raised. This extension consists of a frame 32 having a vertical pair of angle iron members secured together as by a plate 33. Flanges of the frame irons are provided with holes 34 in which pins may be selectively placed either for engaging the lifting hooks 35, 36 and 37, or for hanging the frame on the rack hooks 22 and 23. The hooks 35 and 36 are similar to the previously described hooks 28 and 29, and may be the same ones, while the hook 37 is preferably constructed, as shown, so that the pin 38, may be secured in any one of the series of holes 39 in the shank of the hook to effect various adjustments. The hooks 35 and 36 are narrower than the space between each pair of hooks 22 and 23 so that they may be engaged either by separate pins in the holes, 34, or by the same pins 40 and

41 which hang the frame 32 on the rack hooks 22 and 23.

In lifting a three section door, as indicated in Figs. 1–5, the hooks 35, 36 and 37 are first driven under the respective door sections so as to be held in place. The frame and jack are then placed in position and the pins 38, 41 and 40 are inserted. As the rack 19 is now slowly raised the hook 37 will first raise the section C a predetermined distance before the pin 41 will engage the hook 36. The sections C and B will now be raised a short distance before the pin 40 will engage the hook 35 to loosen the section A. The jack will then continue to raise all the loosened door sections, A, B and C, until the desired clearance is effected.

The rack engaging, raising and lowering device may now be described, as follows: A lever member, consisting of a forked casting 42 and a long handle 43, is pivotally secured as by stud bolts 44 between the flanges of the irons 11 and 12. The stud bolts 44 do not extend entirely across but only into the forked lever arms, so as to leave room for the insertion and movement of a pair of operating pawls 45 and 46 which are pivoted in the lever 42 and on opposite sides of the center of 44, so that when the lever is operated the pawls will be alternately raised and lowered. The upper ends of the pawls 45 and 46 are engaged, respectively, by springs 47 and 48, which always tend to keep the pawls in operating engagement with the rack teeth 20.

A casting 49, secured in the standard, has a stationary lip 50 which serves to limit the downward movement of the lever, and in the casting 49 is slidably arranged a so-called reversing block 51 having teeth 52 and 53 for respective engagement with the lower ends of the pawls 45 and 46. The block 51 is raised and lowered to its respective upper and lower positions by a cam 54 operated by a hand lever 55.

When the block 51 is in its lower position, as shown in Figs. 4, 6 and 8, the jack is in a rack raising position, the teeth 52 and 53 being idle. As the lever 42—43 is now worked up and down the upper ends of the pawls 45 and 46 are alternately engaged in successive teeth of the rack and ride down over them by virtue of the springs 47 and 48. Thus when the outer end of the lever handle 43 is forced down the pawl 45 will move the rack up until the pawl 46 slips into engagement under the tooth it previously engaged, so that when the handle is then raised up the pawl 46 will force the rack up until the pawl 45 secures a new and lower hold.

When it is desired to lower the rack 19 to its initial position the handle 55 is lifted up, as indicated in Fig. 5, whereby the teeth 52 and 53 are raised to a pawl engaging position. It will now be noticed that when the pawl 46 and hand lever 42—43 are in their lowered positions the tooth 52 will hold the upper end of the pawl 46 away from the rack. As the handle 43 is then lifted the rack 19 will follow down with the pawl 45 until the pawl 46 is released by the tooth 52 and snaps into engagement with the rack. Shortly thereafter the pawl 45 strikes the tooth 53 and is thus disengaged from the rack until the latter is lowered and the tooth 53 disengages from the pawl 45 which then re-engages the tooth immediately above the one last engaged.

It is understood that suitable modifications may be made in the general design and structural details of the invention as herein shown and described, provided, however, that said modifications come within the spirit and scope of the appended claims.

Having now therefore fully shown and described my invention, what I claim to be new and desire to protect by Letters Patent is:

1. A jack, for raising grain car doors having separable vertically movable sections, comprising a rack, means for raising the rack, section engaging devices, and means for associating the section engaging devices with the rack whereby the upward movement of the latter will successively engage the devices to space the sections from each other before raising the entire door.

2. A jack, for raising grain car doors having separable vertically movable sections, comprising a lifting member, a vertical series of hooks for respective engagement with said door sections, means carried by the lifting member for successively engaging the hooks, and means for raising the lifting member.

3. A jack, for raising grain car doors having separable vertically movable sections, comprising a standard, a rack vertically movable in the standard, a hand lever for raising the rack, and a series of removable hooks adapted to be carried by the rack and successively lifted thereby independently of each other, said hooks being engageable with the respective door sections.

4. The method of raising a grain car door having separable vertically movable sections, which consists in forcibly spacing the sections from each other, and then raising all the sections simultaneously and while so spaced from each other.

In testimony whereof I affix my signature.

FRED J. JACKSON.