Aug. 26, 1958 C. E. SHOESMITH 2,849,211

JACK

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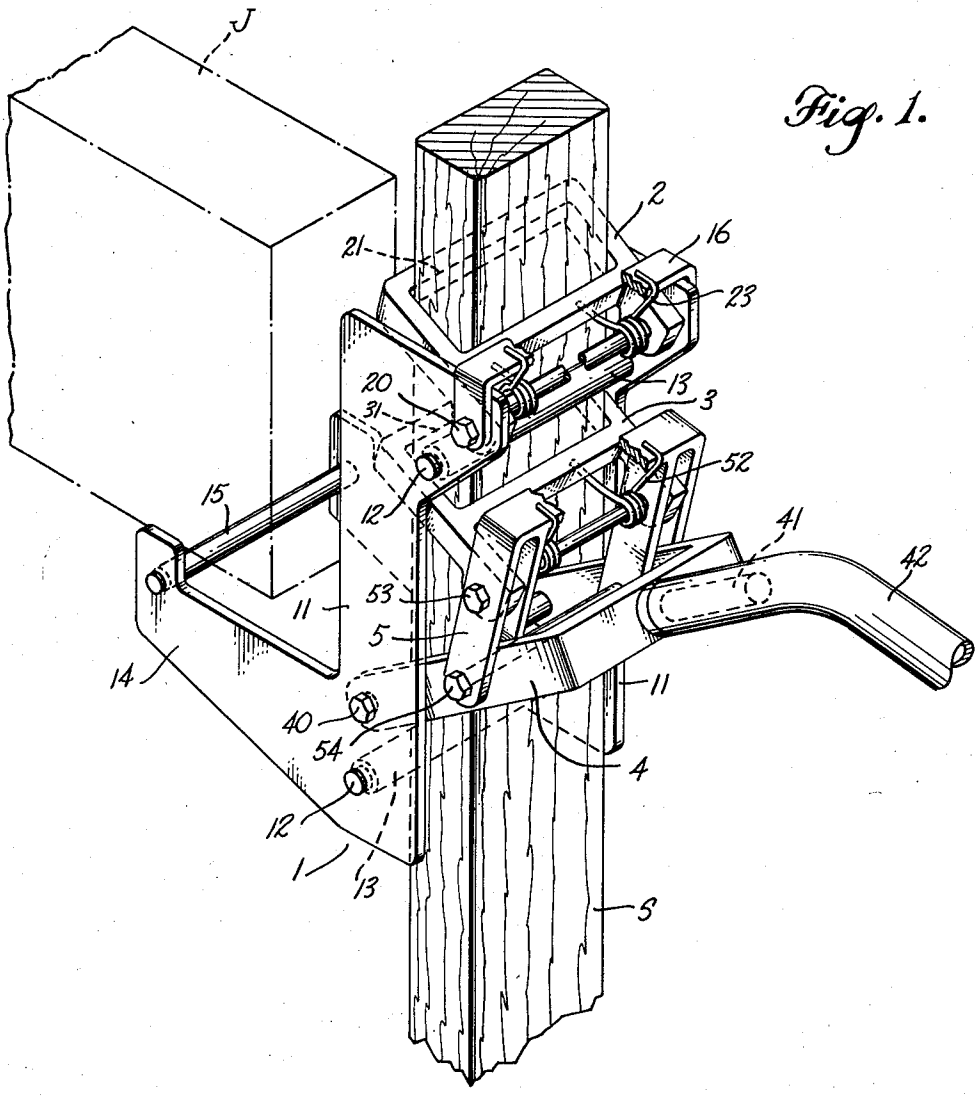


Fig. 1.

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Fig. 3.

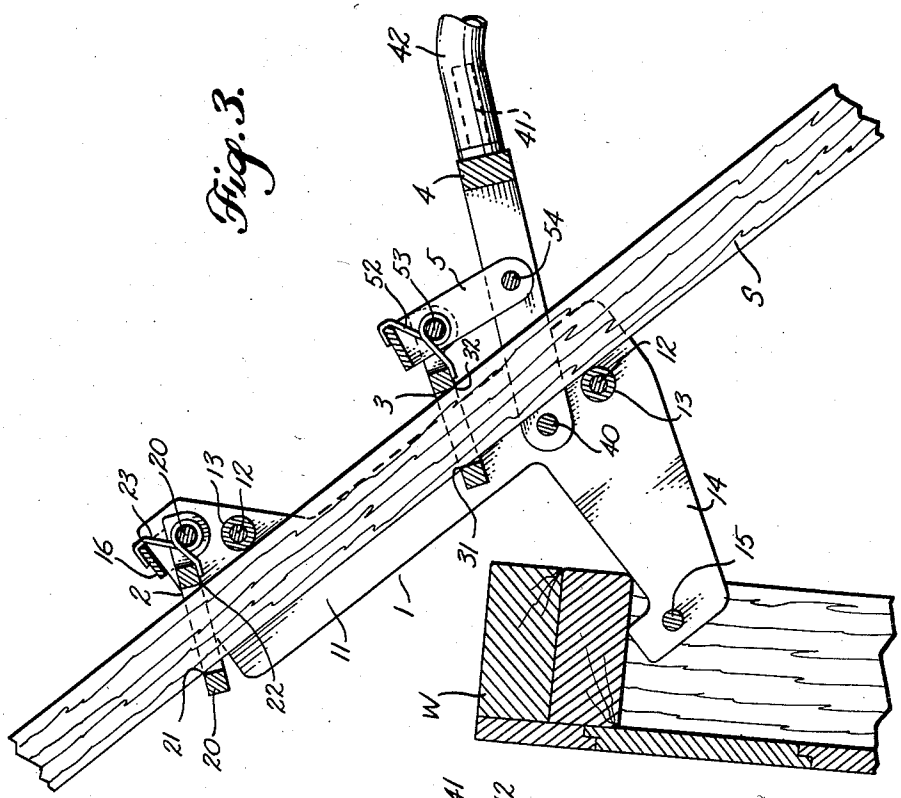
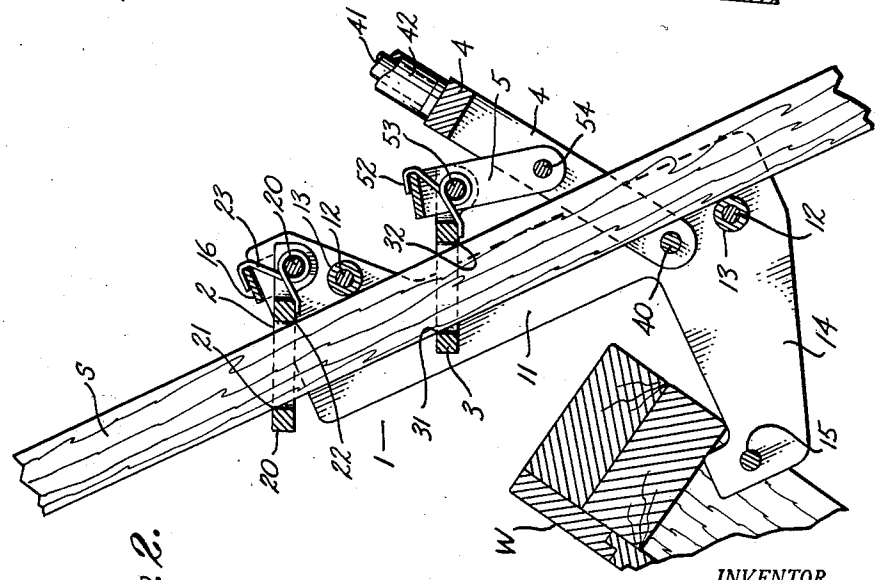


Fig. 2.



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Application June 29, 1956, Serial No. 594,752

1 Claim. (Cl. 254—106)

This invention relates to a jack such as will find wide usefulness in the construction industry, of the type which will "walk" in a single sense along a stud or similar post. Such a jack has the virtues of compactness and reasonably light weight, yet is capable of elevating a heavy load through long distances.

It is the object of the present invention to provide a jack of the nature generally indicated above, which is of simple and rugged construction, capable of being manufactured to sell at a reasonable price, requiring no maintenance other than occasional oiling, and having little probability of malfunctioning over the long term of its useful life.

In the accompanying drawings the invention is shown embodied in a form presently preferred by me, and applied to typical lifting operations in building construction.

Figure 1 is an isometric view of the jack in the process of executing a vertical lift.

Figure 2 is a longitudinal sectional view through the jack, shown in process of elevating a completed wall which has been constructed while lying flat upon a floor, and Figure 3 is a similar view of the jack showing the lifting operation substantially completed.

Such a jack is intended for jobs such as lifting a heavy floor joist J (Figure 1) vertically into position where it is to be supported, or for elevating a wall W (Figures 2 and 3) which has been constructed while lying flat upon a floor, into vertical position. The jack does not include a base nor telescopic members or the like, nor any post of its own, but is intended to advance in a single sense along a stud S or similar improvised post such as is available upon any construction job. Such a stud may be, for example, an ordinary two-by-four stud of rectangular cross-section, although the parts of the jack may be made of a shape and size to cooperate with any other suitable form of stud or post.

A carriage, generally designated by the numeral **1**, is of a size to embrace the stud S, and to advance therealong. It may comprise, for instance, two cast or forged side plates **11** connected by transverse elements **12**, to space the side plates apart by a distance somewhat greater than the greatest cross-sectional dimension of the stud S. One such transverse element **12** is intended to be located at one flat face of the stud and the other element **12** at the opposite face of the stud, and these elements **12** may conveniently support guide rollers **13**. Projecting laterally from the carriage **1** and preferably formed integrally with the side plates **12**, are brackets **14** connected across by the transverse member **15**, the whole constituting a work-engaging bracket for accomplishing the lifting. The guide rollers **13** are so located with relation to the load upon the bracket **14** that these rollers **12** will permit the carriage to travel readily along the stud S except as it is held in fixed position by means which are about to be described.

Two cramping rings are employed. These are of a size and shape to encircle the stud S, and to clear the stud for movement along it when the cramping rings

are disposed in planes generally at right angles to the length of the stud, but when these cramping rings are tilted, their opposite sides engage and grip the opposite faces of the stud and prevent retrograde movement, or constitute a base against which to force the carriage lengthwise of the stud in the advancing sense.

One such cramping ring **2** is pivotally mounted directly upon the carriage **1**, and preferably the pivot bolt **20** for this cramping ring **2** is offset somewhat outwardly of the carriage at the end of the latter opposite the bracket **14** and at the opposite side of the carriage, wherefore the pivot bolt **20** extends across and somewhat outwardly from the face of the stud. This cramping ring **2** is preferably cast or forged of one piece, and its open center is large enough that when the cramping ring **2** is disposed in a plane generally at right angles to the length of the stud it will not engage the stud, but when tilted somewhat its edges **21** and **22** will grip the opposite faces of the stud, and will strongly resist any retrograde or downward movement, as viewed in the several figures of the drawing. This cramping ring **2** is urged into the cramping or gripping position by spring means indicated at **23**, reacting between the cramping ring and the carriage **1** or a strap **16** which, in effect, is a part of the carriage.

The second cramping ring **3** is of similar size and shape and similarly oriented with respect to the stud S, but instead of being mounted upon the carriage directly it is supported from the carriage through the medium of an oscillatable actuating lever **4**, pivoted upon the carriage at **40**, and a link **5** which is pivotally connected at **54** to the actuating lever outwardly of its fixed pivot at **40**, and which is pivotally connected at **53** to the cramping ring **3**. Spring means **52** reacting between the cramping ring **3** and the link **5** urge the cramping ring into its tilted, gripping position just as the spring means **23** urge the first-mentioned cramping ring **2** into its gripping position. Just as in the case of the cramping ring **2**, the cramping ring **3** when thus tilted engages the opposite faces of the studs by its edges **31** and **32**.

The actuating lever is preferably in the form of an integral cast or forged U-shaped element formed with a stud **41** for the reception of a removable pipe handle **42**, by which the length of the lever is increased to afford adequate leverage for lifting a heavy load.

Assuming that the work piece to be lifted is a wall which has been constructed while lying flat upon a floor, the wall is raised at its upper or plate edge sufficiently to introduce the bracket **14** beneath the plate, and the carriage is mounted upon an upright stud S placed with its one end resting upon the floor adjacent the plate of the wall to be lifted. Now, by pumping the actuating lever **4** up and down the carriage is caused to travel upwardly along the stud.

Upward movement of the actuating lever **4** acts downwardly at the pivot **40** and applies a downward load upon the carriage **1**, causing the cramping ring **2** to grip the stud the more tightly, and to prevent downward movement of the carriage. The upward force, acting upon the link **5**, urges upwardly the pivot at **53** and tends to tilt the cramping lever **3** into a plane more nearly at right angles to the length of the stud, in opposition to its spring means at **52**. This lessens the grip of the cramping ring **3** upon the stud, and this ring **3** slides upwardly along the stud. Now, when the actuating lever **4** is moved downwardly from its uppermost position, the reverse movement of the link **5** causes the cramping ring **3** to grip the stud the more tightly, and imposes an upward force on the pivot at **40** and thence upon the carriage **1**. This upward force, acting at the pivot **20**, tends to tilt the cramping ring **2** into a plane more nearly at right angles to the length of the stud S, and so the grip of the cramp-

ing ring 2 upon the stud is lessened and this cramping ring 2 and the carriage 1 whereon it is mounted will slide upwardly along the stud. As soon as the sense of oscillation of the actuating lever 4 is reversed again, the ring 2 grips and the ring 3 slides, and so the carriage advances upwardly along the stud, lifting the wall W with it. From time to time it may be desirable to relocate the foot of the stud, but it has been found that with a jack of this type, two or three men can lift a long and heavy wall into upright position and secure it there, having first constructed it while it lies flat upon a floor, for this is the most economical way of constructing a wall. When the wall has been erected, it is a simple matter to shift the carriage, in the same sense it moved upwardly, off the end of the stud, and only the carriage and its associated mechanism need be stored and carried about, and the stud can be put to use in the building.

The same jack can be used to hoist a heavy joist J, such as is shown in Figure 1, into position for incorporation in a building. Here the stud S is placed vertically at the initiation of the lift, and one end of the joist is supported upon the bracket 14 and its crossbar 15, whereupon the carriage is "walked" upwardly along the stud, lifting its end of the joist. Such a jack will find many uses, not only in the construction industry, but in others.

I claim as my invention:

A jack comprising a carriage formed of two side plates and crossbars joining the plates at their opposite ends and located to engage respectively opposite faces of a stud or like post, a work-engaging bracket projecting from the side plates at the lower end of the latter, an actuating lever of U-shape straddling the post and oscillatably mounted adjacent the lower end of the carriage, at the side thereof adjacent the bracket, a first cramping ring for encircling the stud with some clearance when disposed generally in a plane transverse to the stud's length, but to grip the stud when tilted with respect to the stud's length, pivot means supporting said first cramping ring directly from the carriage, at the upper end of the latter and at the side of the latter opposite the oscillatory axis of the actuating lever, spring means reacting between the carriage and the first cramping ring to urge the latter into tilted gripping disposition, a second cramping ring formed and positioned similarly to the first, intermediate the first ring and the actuating lever, said second cramping ring positioned between the two side plates and the crossbars, a link pivotally connected to and operatively interconnecting each of the second cramping ring and the swinging portion of the actuating lever, for shifting said second cramping ring, by oscillatory movement of the actuating lever in one sense, from its tilted gripping position and lengthwise of the stud while the first cramping ring resists retrograde movement, and spring means reacting between the second cramping ring and the link to urge the former into tilted gripping position while the first cramping ring and the carriage are being advanced along the stud by oscillatory movement of the actuating lever in the opposite sense.

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