Jan. 13, 1953 J. W. WARNER 2,625,368

BUILDING JACK

Filed May 29, 1948 2 SHEETS—SHEET 1

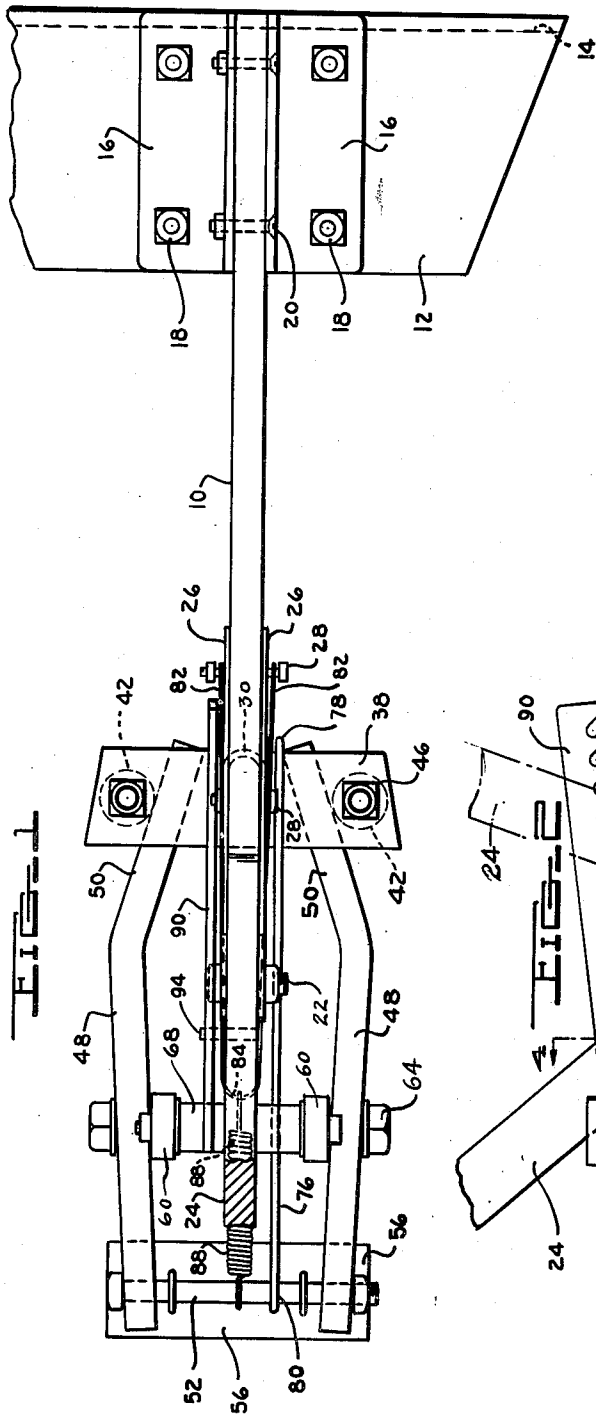


FIG. 1

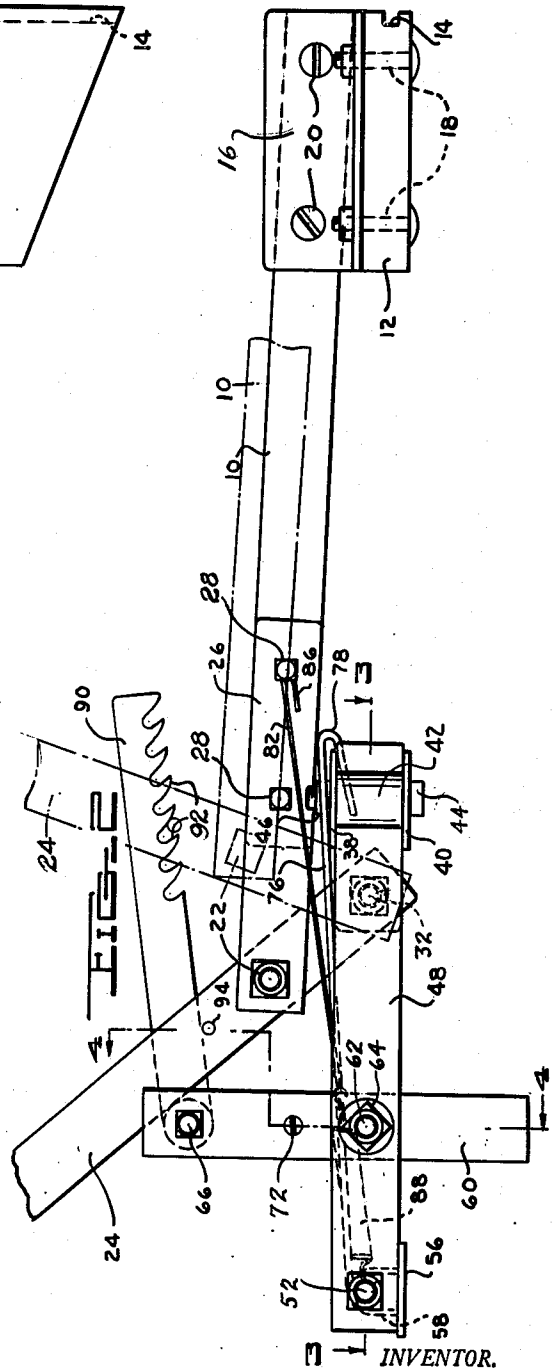


FIG. 2

INVENTOR.
JOHN W. WARNER
BY
Burton & Parker
ATTORNEYS

Jan. 13, 1953 J. W. WARNER 2,625,368

BUILDING JACK

Filed May 29, 1948 2 SHEETS—SHEET 2

FIG. 3

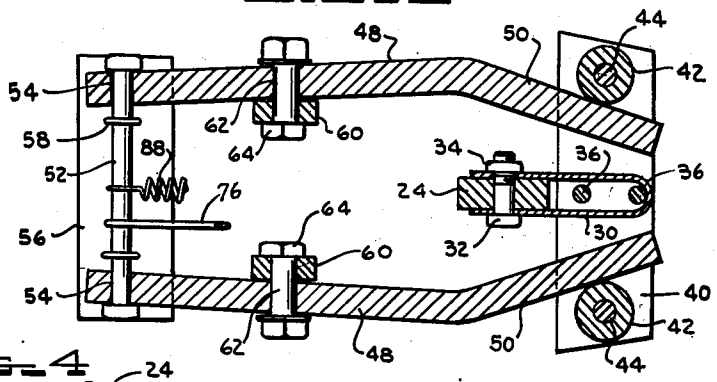


FIG. 4

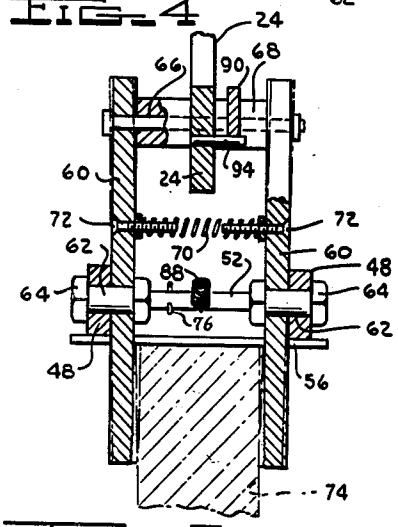


FIG. 7

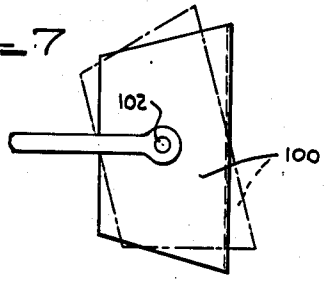


FIG. 5

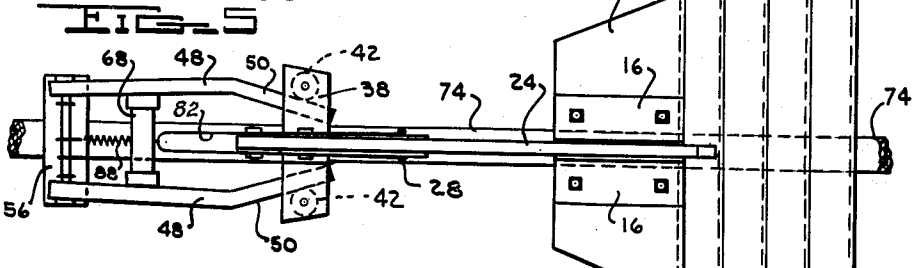
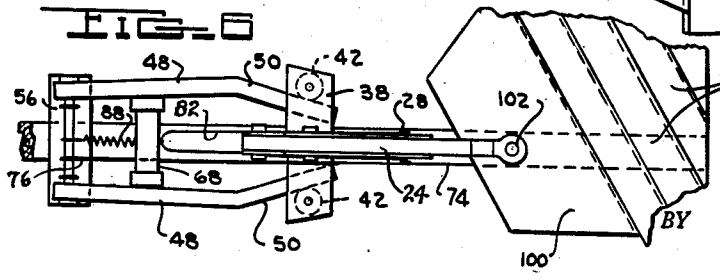


FIG. 6



INVENTOR.
JOHN W. WARNER

BY

Burton & Parker

ATTORNEYS

Patented Jan. 13, 1953

2,625,368

UNITED STATES PATENT OFFICE

2,625,368

BUILDING JACK

John W. Warner, Port Huron, Mich., assignor of one-half to C. Ervin Warner, Port Huron, Mich.

Application May 29, 1948, Serial No. 30,137

5 Claims. (Cl. 254—15)

1

This invention relates to a building construction jack and particularly to a jack for laying flooring and wall siding.

An important object of this invention is to provide an improved jack especially adapted for laying flooring and wall siding and the like which is constructed in a novel manner for applying a thrust and at the same time releasably gripping a fixed supporting element upon which it is mounted. Another important object of the invention is to provide an improved jack of this character which is readily portable and can be carried and operated by one carpenter as the flooring or siding is laid. Another important object of this invention is to provide a device of this character which is readily removable from one fixed supporting element to another and which when thrust force is exerted thereby automatically grips the supporting element upon which it is mounted and when the thrust force is released enables the device to be readily removed for mounting on an adjacent supporting element.

The invention contemplates a device which is readily removable from one supporting element of a building construction to another and which when mounted upon one such element, such as a joist, will automatically grip the same when force is applied for laying a flooring strip or a wall siding strip in position. Upon completion of the operation on that joist the gripping mechanism is automatically released and the device can be moved to an adjacent joist. An important feature of the invention is the provision of a gripping mechanism which performs its operation only so long as force is applied upon the flooring strip or wall siding. The gripping mechanism is so operatively associated to the force applying mechanism that it automatically grips the supporting element or joist upon which the device is mounted and holds the device from any movement thereon as the force is applied. An important feature of the invention is the provision of a single manually operable lever adapted to actuate the thrust applying mechanism and as resistance is encountered thereby to cause the gripping mechanism to engage the support upon which the jack is mounted and temporarily hold the same against movement thereon. A further important feature of the invention is the provision of means for locking the device in thrust applying position in order that the carpenter may nail or otherwise secure the flooring or siding in place.

Various other objects, advantages and meritorious features of the invention will become

2

more fully apparent from the following specification, appended claims, and accompanying drawings wherein:

Fig. 1 is a top plan view of the device showing the parts in inoperative position,

Fig. 2 is a side elevation of the device showing the parts in the position of Fig. 1,

Fig. 3 is a horizontal sectional view through the device taken along line 3—3 of Fig. 2,

Fig. 4 is a vertical sectional view through the device taken along line 4—4 of Fig. 2,

Fig. 5 is a top plan view of the device mounted upon the joist and shown in the act of applying force to laying flooring strips in position,

Fig. 6 is a top plan view of a device similar to that in Fig. 5 but modified for laying flooring set at a kittering angle, and

Fig. 7 is a top plan view showing in full and dotted outline two adjustable positions of the thrust applying head of the device of Fig. 6.

In general, the invention comprises a thrust applying mechanism and a releasable gripping mechanism so operatively related that during the advance of the thrust member the gripping mechanism automatically engages and holds the device to a supporting element such as a floor joist.

A single manually operable lever is provided which actuates the thrust applying mechanism and is so operatively coupled to the gripping mechanism that it causes the latter to grip the supporting element upon which the jack is mounted only so long as resistance is encountered by the thrust applying mechanism.

The thrust applying mechanism comprises an arm or bar 10 of metal or the like carrying on its outer end a head shaped to engage and force into position a flooring strip or wall siding. The head comprises a transversely extended member 12 grooved or rabbeted as at 14 so as to engage the tongue edge of a flooring strip or wall siding. The member 12 extends under the bar 10 and crosswise thereof as shown in Figs. 1 and 2 and is secured to the outer end of the bar 10 by means of two bracket members 16—16. Each bracket member 16 is of L-shaped configuration having one section thereof secured by bolts 18 to the head member 12 and the other section thereof secured to the bar 10 by bolts 20. The bolts 20 extend completely through the arm 10 and serve to secure the bracket sections flat against the sides of the bar in the manner shown in Fig. 1. The bolts 20 secure the arm 10 to the head 12 at a slight inclination to the plane of the latter as shown in Fig. 2 in order that the rear end of the

arm may clear certain operating parts of the jack.

The rear end of the thrust applying bar 10 is pivotally connected by a bolt and nut assembly 22 to a lever member 24. This is preferably accomplished by two plate members 26—26 secured to the opposite sides of the rear end of the bar 10 by bolts 28 and projecting therebeyond to form a bifurcated or forked connection straddling the lever 24. The jack is usually mounted so that the lever swings in a vertical plane and the connection of the bar 10 thereto is such that the lower end of the lever projects below or bebeyond the pivotal connection 22 as shown in Fig. 2.

The lower projecting end of the lever 24 is pivotally connected to a movable part of the gripping mechanism. As shown in Fig. 3 a U-shaped member or strap 30 straddles the lower end of the lever 24 and is pivotally connected thereto by means of bolt 32 retained in position by nut 34. The U-shaped member or strap 30 extends forwardly of the jack and the closed end thereof partially encircles a pair of spaced apart vertical extending bolts 36—36. The latter are connected to top and bottom transversely extending plates 38 and 40 respectively which together constitute a cross member of the assembly projecting laterally of the device beyond the opposite sides of the strap 30. Secured to the opposite ends of the two plates 38 and 40 and bridging the distance therebetween are two cylindrical members 42—42 of corresponding shape and size. These members are each axially bored to receive a bolt 44 which extends through the member and through the top and bottom plates 38 and 40 and is secured in position by a nut 46 threaded to its extremities. The assembly consisting of the top and bottom plates 38 and 40 and the cylindrical members 42—42 forms a wedging implement which, as will be more particularly pointed out hereinafter, causes the gripping mechanism of the jack to releasably engage the supporting element of the building construction upon which the jack is mounted.

The gripping mechanism includes two correspondingly shaped side bars 48—48 extending for the major portion of their length at a slightly diverging angle as shown in Fig. 3 and having at their forward ends converging sections 50—50 which pass inside and close to the cylindrical members 42—42. The rear ends of the side bars 48—48 are connected together by a transverse pin 52 which extends through slightly oversize holes or apertures 54—54 in each of the side bars. Extending transversely of the side bars 48—48 and under their rear ends is a flat plate 56 upon which the rear ends of the bars rest. The plate is secured to the pin 52 by U-shaped members or hangers 58 shown in dotted outline in Fig. 2, and the mounting is such that the flat plate 56 prevents the side bars 48—48 from swinging relative to one another in their respective vertical planes. The oversize apertures 54—54 through which the pin 52 extends permit the side bars 48—48 to contract slightly toward one another.

Carried by the side bars 48—48 are gripping members or jaws adapted to engage the supporting element upon which the jack is mounted and to hold the jack from relative movement thereon. The gripping members are indicated at 60—60 and comprise vertical bars each associated with a side bar 48 and extending both above and below the latter. Each jaw member 60 is secured to the side bar with which it is associated intermediate the length of the latter by means of a bolt 62 and nut 64. The securement is such that the jaw members are held to their respective side bars against pivotal movement. The inner faces of the jaw members may be serrated to improve their grip upon the supporting element.

The upper projecting ends of the jaw members 60—60 are connected together by a pin 66 shown best in Fig. 4 enclosed within an encircling spacer member 68. The latter is loosely mounted on the pin 66 and has an axial dimension slightly less than the normal spacing of the jaw members. The jaw members are yieldingly urged apart by spring means such as that illustrated at 70 in Fig. 4. The spring 70 is in the form of a coil and the opposite ends thereof are received over screw members 72—72 secured to and projecting inwardly from the gripping members 60—60.

It is evident from the description of the invention thus far made that upon rearward movement of the wedging implement consisting of the plate members 38 and 40 and cylindrical members 42—42 the latter will ride upon the inclined faces of the converging sections 50—50 of the side bars and cause the latter to move toward one another. This movement will be transmitted by the side bars to the jaw members 60—60 and cause the latter to contract toward one another and assume a position such as that shown in dotted outline in Fig. 4. The jaw members 60—60 are spaced apart from one another to straddle a conventional supporting element of a building such as the joist shown at 74 in Fig. 4 or a vertical studding or the like. When the jack is mounted upon a supporting element such as the joist 74 the contractible movement of the jaw members will bring them into gripping engagement with the opposite sides of the joist. As will be described hereinafter, this contractible movement will serve to clamp the jack to the hoist or other fixed support against movement relative thereto.

When the jack is mounted upon a supporting element, such as the joist 74, the back plate 56 of the side bar assembly and the bottom plate 40 of the wedging implement bear against the supporting element. In the case of a horizontal joist upon which flooring is laid, the two plates rest thereon and support the jack in the upright position shown in Fig. 4. Side members 48, jaw member 60, plates 38 and 56, and associated connecting parts constitute a base which serves to support the jack in an upright position upon the joist as described. When the jaw members 60—60 are not in gripping engagement with the joist or other supporting element, the jack may be shifted longitudinally of the element to position it within operating range of the flooring or siding being laid. In expanded position, the jaw members 60—60 loosely straddle the joist or other supporting element and, with the assistance of the heads of the bolts 18 and 44 which project below the plates 40 and 56 on opposite sides of the joist, serves to hold the jack in proper alignment on the joist as it is shifted therealong.

Certain auxiliary mechanisms are associated with the jack to assist in its operation. Means is provided for preventing complete separation of the wedging implement from the gripping mechanism. This is accomplished in any suitable manner such as by the provision of a wire

member 76 best shown in Figs. 1 and 2 which is hooked at its forward end 78 for loosely engaging the top plate 38 of the wedging device and at its rear end 80 for connection to the cross pin 52. This wire member limits the advance of the wedging device relative to the side bars 48—48 but allows the wedge to move rearwardly and compress the side bars together to perform the gripping action.

Another feature of the invention which materially assists in the operation thereof is the provision of means for yieldingly maintaining the forward inwardly bent sections 50—50 of the side bars in contact with the round wedging elements 42—42. This means comprises a U-shaped wire member 82 straddling the lever 24 and having its closed end 84 spaced rearwardly from the lever. The two legs of the U-shaped wire member extend forwardly along the opposite sides of the plate members 26—26 of the thrust member 10 and are hooked at 86 over the forward bolt 28 securing the side plates 26—26 on the thrust member. As shown in Fig. 1 the bolt 28 to which the wire member 82 is connected is assembled so as to provide clearance for receiving the hooked ends 86 of the wire member. The opposite closed end of the wire member is yieldingly connected by a coiled spring 88 to the cross pin 52. The wire member 82 and the coiled spring 88 forms a yieldable connection between the thrust member and the gripping mechanism which when the thrust member is initially moved forwardly in force applying direction causes the gripping mechanism to follow its movement and to maintain close contact between the converging end sections 50—50 of the side bars and the round wedging elements 42—42.

A feature of the invention is the provision on the jack of means for releasably locking the parts in force applying position. This enables a single carpenter to operate the jack to force a flooring or siding strip into position and thereafter remove his hands from the jack to nail or otherwise secure the strip in place. This means comprises an arm 90 pivoted at one end to the spacer 68 on the cross pin 66. The arm is mounted so as to swing in a plane slightly offset to the plane of the operating lever 24 and is provided with slanting notches or teeth 92 on its bottom edge. The operating lever 24 is provided with a laterally projecting pin 94 which as the lever is moved rides along the bottom edge of the arm 90. When it is desired to use the locking arm it is swung to the position shown in Fig. 2 to rest on the pin 94. One side of each notch 92 is curved or flared outwardly so that as the lever is moved forwardly in thrust applying direction the pin 94 will readily slip by the notches. However, when manual pressure on the operating lever is released the pin 94 will fall into a notch 92 and lock the parts in force applying position. The thrust member is easily released for retracting movement by swinging the arm 90 upwardly out of the way.

In the application of the device to the laying of flooring strips the jack is mounted in upright position upon a joist, such as that indicated at 74 in Figs. 4 and 5, upon which the flooring strips are being laid and within stroke range of any previously laid strips. In Fig. 5, certain earlier laid strips are indicated at 96. The last laid strip which is being forced into position against the previously laid strips is indicated at 98. When the jack is positioned on the joist 74 the lever arm 24 is in a rearwardly inclined position preferably abutting the spacer member 68 as shown in Fig. 2. In this condition the jaws 60—60 of the gripping mechanism loosely embrace the joist and, if necessary, the jack may be slid toward or away from the flooring strip 98 for the most satisfactory operating position. The lever 24 is now swung forwardly and for the major portion of this swinging movement the lever pivots on the bolt 32 as a fulcrum. Since the thrust applying member 10 is connected to the lever above the bolt 22 it is forced forward by the lever. As the thrust member 10 is projected forwardly, the yieldable connection between the thrust member and the gripping mechanism formed by the spring 88 and the U-shaped member 82 causes the gripping mechanism to shift forwardly with the thrust member and maintain relatively close relationship between the side bar converging end sections 50—50 and the rounded wedging members 42—42.

In the later part of the forward swinging movement of the lever 24, the head 12 on the thrust member abuts the outside edge of the flooring strip 98. As further resistance is encountered by the lever in its forward swinging movement, it commences to pivot about bolt 22 as a fulcrum forcing the bolt 32 and the metal strap 30 rearwardly. The strap 30 as previously described encloses the two bolts 36—36 connecting the top and bottom plate members 38 and 40 of the wedging mechanism and as the strap moves backward it abuts the leading bolt 36 and causes the plates and the cylindrical wedging elements 42—42 to travel rearwardly. The shifting movement of the wedging elements 42—42 rearwardly causes them to travel along the converging end sections 50—50 of the side bars 48—48 and draw them together under high pressure. The contractible movement of the side bars in turn draws the jaw members 60—60 toward one another and into tight clamping engagement with the opposite sides of the joist. The joist is clamped by the jaws with such pressure that the jack, with the exception of the lever and thrust member, is immovably held on the joist. Thereafter any further swinging movements of the lever forwardly will cause the lever to pivot again on the bolt 32 as a fulcrum and such movement will thrust the member 10 forward with greater force. The last positioned flooring strip 98 is thus forced into position by a single swinging movement of the lever and may be immediately nailed or otherwise secured to the joist 74.

After resistance to forward movement is encountered by the lever and initial clamping pressure has been applied to the joist, any further forward movement of the lever applies a toggle action on the thrust member and the wedging implement tending to spread the same apart. This results from the location of the two pivotal axes with respect to the operating level of the head 16 of the thrust member. The axis of the lower pivotal connection formed by the bolt 32 lies in the plane of the head 16 and the floor board engaged thereby. However, the axis of the upper pivotal connection formed by the bolt 22 is above the operating level of the head 16. During the later movements of the lever in the forward direction after clamping pressure has been brought to bear on the joist, the upper pivotal axis traverses an arcuate path directed downwardly toward the plane of the head 16 and be-

tween the same and the lower pivotal axis. A toggle action results which applies an extremely strong force in opposite directions causing the thrust member to increase its pressure on the floor board and at the same time increasing the pressure of the clamping members on the joist to hold the jack from movement.

If only one carpenter is laying the flooring, the notched arm 90 may be swung to the operating position shown in Fig. 2 where it will self-lock the thrust member in substantially its maximum forward position. Thereafter, the carpenter may remove his hands from the lever and nail the flooring strip in place.

After the flooring strip is nailed to the joist upon which the jack is mounted, the jack may be quickly removed from the joist for use on the next or nearby joist by simply swinging the lever 24 rearwardly. The rearward movement of the lever accomplishes two functions. It retracts the thrust member 10 and releases the clamping pressure of the jaws 60—60. All the parts of the gripping mechanism and the wedging device become relatively loose and the spring 70 between the jaws urges them apart sufficiently that the jack may be immediately picked up and transferred to another joist. In fact, the jack of the illustrated embodiment of the invention is sufficiently light that after the retraction of the lever the carpenter without removing his hand from the lever can use the lever to lift the body of the jack from the joist and transfer it to another joist. Thus, by handling the lever alone, a carpenter can drop the jack in place upon a joist or other supporting member, swing the lever forward to shift the flooring strip in place, nail the strip in place, retract the lever and lift the jack from the joist for use on another joist, without touching any other part of the device.

Figs. 6 and 7 illustrate a modification of the invention wherein the head 12 previously described is adapted by laying flooring at an angle other than a right angle to the joists. In Fig. 6, the operating head corresponding to member 12 is indicated at 100. Instead of being fixed to the thrust member 10 the head is pivotally connected thereto. As shown in Fig. 6 the forward extremity of the thrust member is widened and bored to receive a pin 102 which extends through the plate member 100 constituting the operating head and pivotally connects the same thereto. As a result, the head may be turned on the pivot 102 to any desired position, one of which is indicated in dotted outline in Fig. 7. Referring to Fig. 6, the modified form of joint is shown mounted on a joist and urging the last positioned flooring strip against previously laid flooring strips 104 extending at an acute or kittering angle. The pivotal mounting 102 enables the head to adjust itself to the angle at which the flooring strips are laid and apply equal force throughout its length against the last positioned strip.

What I claim is:

1. A floor laying jack comprising, in combination, a base for supporting the jack in an upright position on the upper edge of a floor joist, a pair of laterally disposed clamping members depending below the base and adapted to clampingly engage the opposite sides of the floor joist upon which the jack is supported, a pair of similarly shaped side bars extending forwardly from the clamping members and having their forward end sections converging toward one another, each bar being secured to the clamping member on its respective side of the jack for joint inward and outward movement relative to the adjacent side of the joist upon which the jack is supported, wedging means reciprocatingly movable in a fore and aft direction and effective upon rearward movement to engage the converging ends of the side bars and draw the same and the clamping members toward one another, a forwardly extending thrust member having a floor board engaging head and a rearwardly extending arm, a lever swingable in the vertical plane of the floor joist upon which the jack is supported, means pivotally connecting the lower end of the lever to the wedging means on a transverse axis lying substantially in the plane of the head of the thrust member, means pivotally connecting the lever to the arm of the thrust member on a transverse axis spaced above the first mentioned pivotal axis and at a level above the head of the thrust member, said pivotal axes serving as alternate fulcrums for the lever and functioning to advance the thrust member when the lever is swung in a forward direction about the lower axis and to move the wedging means rearwardly when the lever is swung in the same direction about the upper axis.

2. In a building jack, a downwardly inclined forwardly movable thrust member, a rearwardly movable cross member located on a level below that of the rear end of the thrust member, a pair of inwardly movable laterally disposed clamping jaws for engaging the opposite sides of a beam, means operable upon rearward movement of the cross member to draw the jaws toward one another into clamping engagement with the opposite sides of a beam, an upwardly projecting lever, means pivotally connecting the lower end of the lever to the cross member on a transverse axis, means pivotally connecting an intermediate part of the lever to the rear end of the thrust member on a transverse axis elevated with respect to the first pivotal axis, said pivotal axes serving as alternate fulcrums for the lever and causing the thrust member to move forwardly when the lever is swung in a forward direction about the lower pivotal axis and causing the cross member to move rearwardly when the lever is swung in the same direction about the higher pivotal axis, the lever alternately pivoting on one or the other of said axes as it moves in a forward direction depending on the extent of the resistance encountered by the thrust member and the cross member to forward and rearward movements respectively.

3. In a floor laying building jack, a base for supporting the jack in an upright position on the upper edge of a floor joist, a forwardly movable thrust member having a floor board engaging head and an arm extending rearwardly from the head at an upward inclination, a cross member reciprocatingly movable in a fore and aft direction, a pair of laterally disposed clamping jaws located below the base and movable toward one another to clampingly engage the opposite sides of the floor joist upon which the jack is supported, means responsive to the rearward movement of the cross member for moving the clamping jaws toward one another into clamping engagement with the opposite sides of the joist upon which the jack is supported, an upwardly extending lever, means pivotally connecting the lower end of the lever to said cross member on a transverse axis below the level of the rear end of the inclined arm of the thrust member, means pivotally connecting an intermediate portion of the lever to the rear end of the arm of the thrust

member on a transverse axis on a level above that of the first mentioned pivotal axis, said lever adapted upon initial forward swinging movement to pivot about the lower axis and move the thrust member forwardly but upon encountering resistance to forward swinging movement to pivot about the upper axis and move the cross member rearwardly to clampingly engage the jaws with the opposite sides of the joist upon which the jack is supported.

4. In a floor laying building jack, a base plate for supporting the jack in upright position on a floor joist, a forwardly extending thrust member having a floor board engaging head and an arm extending rearwardly from the head at an upward inclination, a cross member reciprocatingly movable in a fore and aft direction and located below the level of the rear end of the arm of the thrust member, a pair of opposed clamping jaws supported for movement toward one another for clampingly engaging the opposite sides of the floor joist upon which the jack is supported, wedging means responsive to the rearward movement of the cross member and operable to move the clamping jaws toward one another into clamping engagement with a floor joist, a lever swingable in the vertical plane of the floor joist upon which the jack is supported, means pivotally connecting the lower end of the lever to the cross member for swinging movement about a transverse horizontal axis, means pivotally connecting a higher portion of the lever to the rear end of the arm of the thrust member for swinging movement about a transverse horizontal axis spaced above the level of the floor board engaging head of the thrust member, said pivotal axes serving as alternate fulcrums for the lever and being so spatially related to one another and the floor board engaging head of the thrust member that upon forward swinging movement of the lever about the lower pivotal axis the upper pivotal axis will traverse an arcuate path directed forwardly and downwardly toward the level of the floor board engaging head and between the same and the lower pivotal axis to apply a toggle action tending to simultaneously move the thrust member forwardly and the cross member rearwardly.

5. In a building jack, a base for supporting the jack in upright position on a beam of a building, a forwardly extending thrust member having a work engaging head and an arm extending rearwardly from the head and at an upward inclination therefrom, a cross member projecting laterally from opposite sides of the jack and being mounted for reciprocating movement in a fore and aft direction, a pair of laterally disposed clamping jaws located at a level below the base and mounted for movement toward one another for engaging the opposite sides of the beam upon which the jack is supported, means carried by said jaws and formed with side faces which converge toward one another in the forward direction of the jack, wedging means carried by the laterally projecting ends of the cross member and engageable with said side faces and effective upon rearward movement of the cross member to ride along said side faces and cause the jaws to be drawn toward one another into clamping engagement with the opposite sides of the beam upon which the jack is supported, a lever swingable in a vertical plane, means pivotally connecting the lower end of the lever to the cross member for swinging movement about a transverse horizontal axis, means pivotally connecting a higher intermediate portion of the lever to the raised rear end of the arm of the thrust member for swinging movement about a second transverse horizontal axis, said lever being alternately swingable about said pivotal axes and being effective upon forward swinging movement to cause said second pivotal axis to traverse an arcuate path directed forwardly and downwardly between the head of the thrust member and the first mentioned pivotal axis and to apply a toggle leverage action simultaneously exerting a forward thrust on the thrust member and a rearward thrust on the cross member.

JOHN W. WARNER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
780,054	McDaniel	Jan. 17, 1905
1,638,985	Daniel	Aug. 16, 1927
1,911,705	McMullan	May 30, 1933
2,351,691	Mansir	June 20, 1944
2,391,657	Tavelin	Dec. 25, 1945

FOREIGN PATENTS

Number	Country	Date
4,355	Great Britain	of 1909