June 9, 1964 R. W. EATOUGH 3,136,528

RESILIENT JACKING MECHANISM

Filed July 2, 1962 3 Sheets-Sheet 1

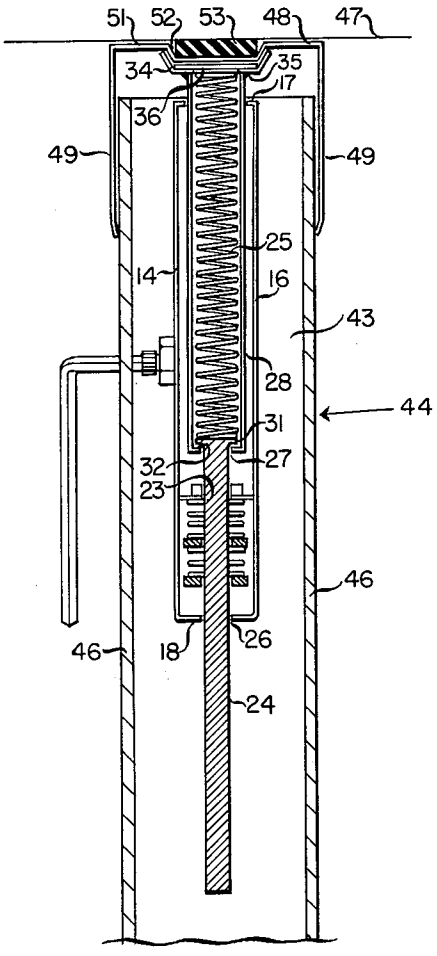


FIG. 1

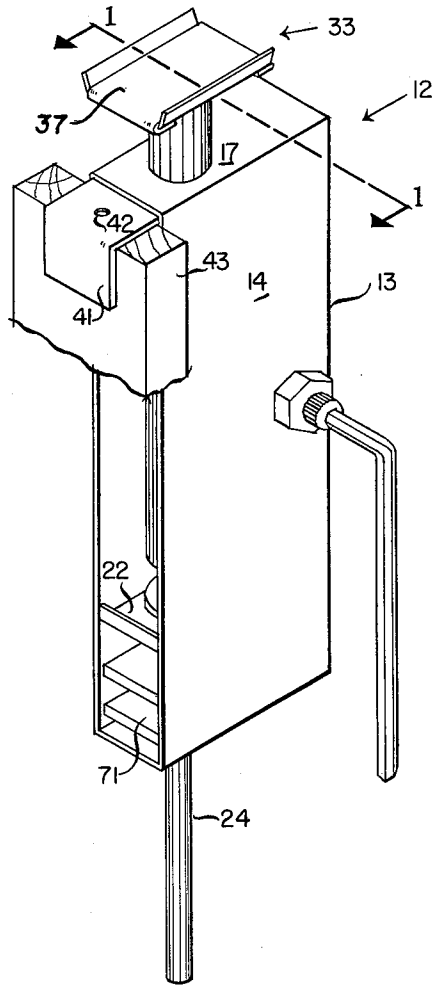


FIG. 2

INVENTOR.
RALPH W. EATOUGH
BY Lothrop & West
ATTORNEYS

June 9, 1964 R. W. EATOUGH 3,136,528

RESILIENT JACKING MECHANISM

Filed July 2, 1962 3 Sheets-Sheet 2

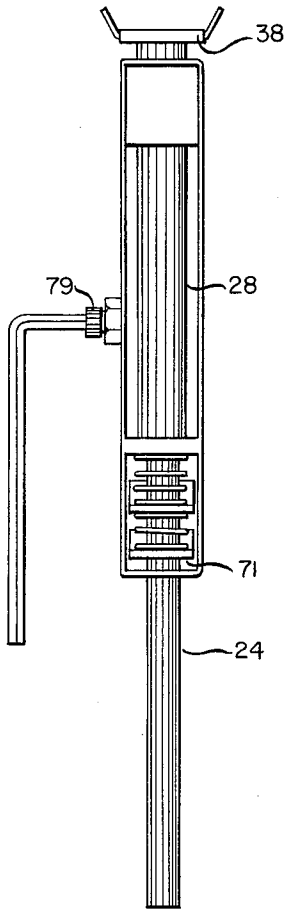


FIG. 3

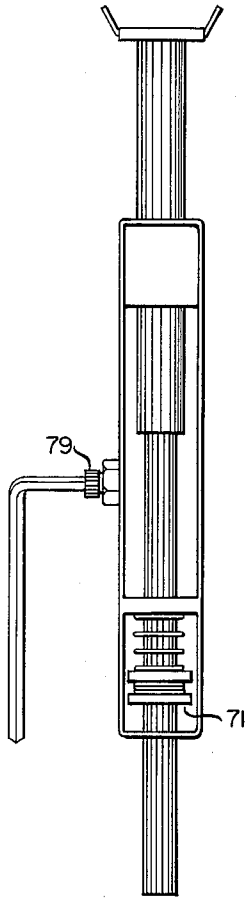


FIG. 4

INVENTOR.
RALPH W. EATOUGH
BY Lothrop & West
ATTORNEYS

June 9, 1964 R. W. EATOUGH 3,136,528

RESILIENT JACKING MECHANISM

Filed July 2, 1962 3 Sheets-Sheet 3

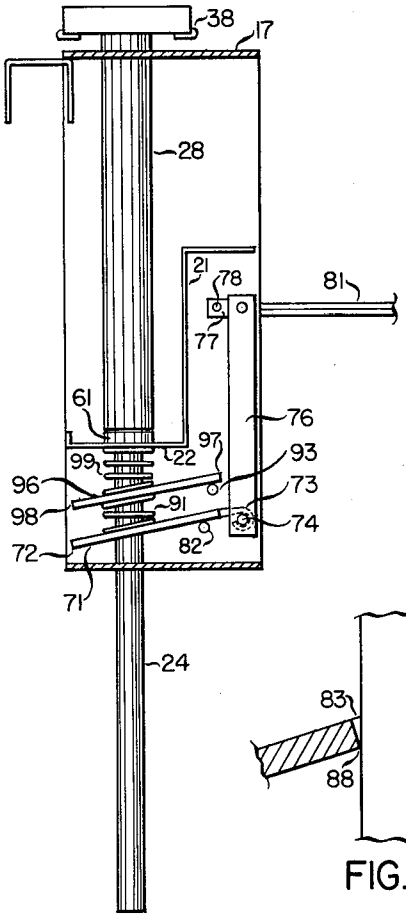


FIG. 5

FIG. 7

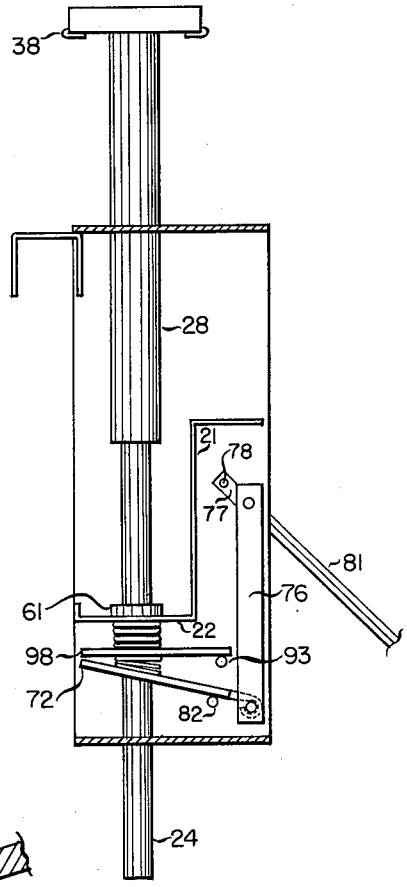


FIG. 6

INVENTOR.
RALPH W. EATOUGH
BY Lothrop & West
ATTORNEYS

United States Patent Office 3,136,528 Patented June 9, 1964

3,136,528

RESILIENT JACKING MECHANISM

Ralph W. Eatough, Orange, Calif., assignor to Edwin K. Dole, Carl W. Eatough, and Ralph W. Eatough, doing business as Architectural Products and Development Company, Sacramento, Calif., a co-partnership

Filed July 2, 1962, Ser. No. 206,702
2 Claims. (Cl. 254—106)

The invention relates to jacks and, more particularly, to jacking devices for securely positioning movable building partitions.

One of the more important recent advances in architecture and building construction has been the growing demand for and use of interior walls or partitions which can be moved to meet the requirements of changing conditions and uses of the enclosed space.

Heretofore, however, the task of installing and removing the partitions has been a difficult one owing to the length of time required, first to mount the partitions so they would remain securely in place, and later to dismount them. The jacking devices previously used, in other words, have been slow in operation.

Furthermore, these earlier mechanisms, generally of the screw jack type, have been so rigid and unyielding as to create a problem in the event the ceiling and floor separate even slightly in excess of the distance or spacing between the ceiling and floor when the partition was initially installed. Such additional separation can occur over a period of time, as by sagging of the floor, or, more quickly, as a result of large temperature changes or an earthquake. If separation occurs, lateral forces on the partition could cause the partition to fall over.

Still other previous types of partition mounting devices have utilized the principle of vertically extending the partition as by use of a gas in an elongated horizontally disposed bag or casing disposed between the partition and the ceiling. While such mechanisms have provided the resiliency lacking in the unyielding screwjack devices, the air-bags tend to leak, even though slowly, and, in time, unless periodically checked and re-inflated, create a risk of separation from the ceiling, with attendant risk of the partition's falling over.

It is therefore an object of the invention to provide a resilient jacking mechanism which not only provides a very secure mounting, but which also possesses a permanent resiliency capable of accommodating to all but the most violent distortions of the building ceilings and floors.

It is another object of the invention to provide a resilient jacking mechanism which is highly reliable and which lends itself to particular use in connection with movable walls and partitions.

It is a further object of the invention to provide a jack which is rapid in operation.

It is still another object of the invention to provide a jack which is relatively economical and which has but few moving parts to get out of order.

It is yet another object of the invention to provide a jack which can readily be operated even by unskilled personnel.

It is another object of the invention to provide a generally improved resilient jacking mechanism.

Other objects, together with the foregoing, are attained in the embodiment described in the following description and shown in the accompanying drawings in which:

FIGURE 1 is a vertical section of the device in a typical environment, the plane of the section being generally indicated by the line 1—1 in FIGURE 2, the crank member also being shown to illustrate its relative vertical position on the jack;

FIGURE 2 is a perspective view of the jack to an enlarged scale, showing the mechanism secured against downward movement by attachment to a vertical stud or stile;

FIGURE 3 is an end elevational view showing the lift rod in lowermost position;

FIGURE 4 is a view comparable to that of FIGURE 3 but with the lift rod in an elevated position;

FIGURE 5 is a side elevational view of the structure shown in FIGURE 3 and with portions of the device being broken away to reveal interior details;

FIGURE 6 is a view comparable to that of FIGURE 5, but with the parts arranged preparatory for lowering; and

FIGURE 7 is a fragmentary sectional view, to an enlarged scale, of the holding (or lifting) plate.

While the resilient jacking device of the invention is susceptible of numerous physical embodiments, depending upon the environment and requirements of use, substantial numbers of the herein shown and described embodiment have been made, tested and used and all have performed in an eminently satisfactory manner.

The mechanism of the invention, generally designated by the reference numeral **12**, comprises a hollow, box-like housing **13** including a front side **14**, a rear side **16**, an upper end **17** and a lower end **18**.

Extending between and mounted on the front and rear sides is a stepped wall **21** (see FIGS. 5 and 6) including a lower, horizontal web portion **22** having an opening **23** formed therein to accommodate a vertical lift rod **24**, or push rod. The rod **24** projects downwardly through an opening **26** in the lower end **18** of the housing and upwardly through an opening **27** in the lower end of a tube **28**. The upper end of the rod terminates in an annular shoulder **31** adapted to overlie, in lower-most position of the rod, an annular flange **32** surrounding the opening **27**. Disposed above and in engagement with the rod shoulder **31** is a strong compression spring **25**.

Surmounting the upper end of the tube **28** is a cap member, generally designed by the reference numeral **33**. The cap member includes a trough-shaped plate **34** fastened to the tube by a weldment **35**, the plate **34** having a central opening **36** through which the rod and the spring are inserted at the time of assembly. After the rod and spring are assembled or placed within the tube, a cover plate **37** is placed on the trough plate **34** and the elongated ends **38** of the cover plate are recurved about the ends of the trough plate (see FIGS. 5 and 6) to secure the cover plate to the trough plate.

As appears most clearly in FIGS. 1 and 2, the jack is secured against downward movement by a bracket **41** attached, as by a fastening **42**, to a vertical stud **43**, or stile. The stud **43** covers the end of a laminated wall (see FIGURE 1), generally designated by the reference numeral **44**, the wall including a pair of outer panels **46** (the outer panels **46** not being shown in FIGURE 2).

The upper end of the stud **43** and the panels terminate somewhat below the ceiling **47**, or overhead member. A channel member **48** having a pair of depending trim skirts **49** spans the distance from the top of the wall **44** to the ceiling **47**. On the top of the channel is a horizontal web **51** having a central trough-shaped depression **52** adapted to register and engage with the trough plate on the cap member. Disposed within the depression **52** is a resilient cushioning and frictional member **53** which is brought into tight contact with the ceiling as will subsequently be described.

With particular reference to FIGURE 5, it will be noted that when the rod **24** and the tube **28** are in lowermost position that the bottom of the tube **28** rests upon a resilient washer **61** and the cap member **38** extends above the top end **17** of the housing only a short distance.

When, however, the tube **28** and the rod **24** are in

elevated position (see FIGS. 4 and 6), the cap 38 extends well above the top of the housing. The considerable amount of possible upward travel of the cap member enables the jack to effect its holding or securing effort even though the ceiling is considerably above the top end of the housing and the wall 44.

In other words, the movable wall or partition member 44, being, say, three feet in width and seven feet ten inches in height, can be located with its bottom edge on the floor directly below the line on the ceiling 47 to which the partition is to be secured. Then, with the channel member 48 and the resilient strip 53 located on top of the resilient jack mechanism (of which there would perhaps be a pair, one located adjacent the upper outer corners of the partition member), the jack mechanism would be actuated (actually, both jacks would be operated substantially concurrently so as to lift the channel member and the strip 53 in a level fashion. Actuation of the jack would be continued until the rod, the tube, the channel and the resilient strip are elevated and the strip 53 abuts the ceiling, the height of which, for example, could be eight feet.

As the strip 53 first comes into engagement with the ceiling 47 the helical spring 25 is in fully extended condition, as in FIG. 1. Additional upward movement of the rod 24, however, will compress the spring 25 and force the resilient strip 53 upwardly against the ceiling to effect a very strong securing effort. Furthermore, a resiliency is provided in that the cap, the channel and the resilient strip "float," as it were, under spring pressure, enabling these members to follow any fluctuations and distortions which might occur in the vertical separation or distance between the floor and ceiling, as from an earthquake.

Lifting of the rod is achieved by a series of upward reciprocating movements of a lifting plate 71 inclined from a normally lower end 72 to an upper end 73 (see FIG. 5) the upper end 73 being down-turned and recurved to encompass a horizontal pivot pin 74, the pin 74 also having pivotally mounted thereon the lower end of a vertical lever 76.

In turn, the upper end of the lever 76 is pivotally mounted on the outer end of a crank arm 77, which is itself secured to a shaft 78 appropriately secured to an Allen head nut 79, for example, the nut and the shaft being cranked or reciprocably rotated by the customary Allen head wrench 81. A horizontal stop pin 82 acts as a fulcrum (see FIGURE 6) and also limits the downward movement of the lifting plate (see FIGURE 5).

Intermediate the ends of the lifting plate 71 is a circular opening 83 (see FIG. 7) through the plate, thus forming a cylindrical collar 84 encompassing the rod 24. The opening 83 is slightly larger in diameter than the rod 24 and, since the plate is inclined or cocked, the lower left-hand marginal portion 88, or lower lip engages the adjacent surface of the rod. In comparable fashion, the upper right-hand marginal portion 89, or upper lip, also engages the rod.

A fairly weak compression spring 91 biases the left-hand end (see FIG. 5) of the lifting plate downwardly, about the pin 82 as a fulcrum. Thus, when the wrench 81 is rotated so as to lift the lever 76, the pin 74 and the right hand or upper end 73 of the lifting plate, the spring 91 causes the lips 88 and 89 (see FIG. 7) to "bite" into the rod and to lift the rod concurrently with the lifting plate. In the form of the device as it appears most clearly in FIGURE 5, the lifting plate can be elevated until it abuts a horizontal fulcrum pin 93. Then, the wrench is released and the lifting plate will return under pressure of the spring 91 to the base position shown in FIGURE 5. Each subsequent similar movement of the wrench and upward movement of the lifting plate elevates the rod correspondingly.

As the lifting plate returns, each time, from elevated to base position, the right-hand end of the lifting plate (see FIGURE 5) moves downwardly more or less in unity with the left hand end of the plate under downward urgency of the spring 91. Consequently, the lips 88 and 89 when lowering do not "bite" with the same degree of effort as on the upward stroke, and the lifting plate slides down the rod without moving the rod.

During this downward movement of the lifting plate, the rod is maintained in its elevated position by a holding plate 96, the plate 96 having a central opening forming a collar with a lower biting lip and an upper biting lip substantially identical to that previously described for the lifting plate and shown in FIGURE 7.

The right-hand end 97 (see FIG. 5) of the holding plate is supported on the fulcrum pin 93 and the left-hand end 98 is biased downwardly by quite a strong spring 99 interposed between the holding plate 96 and the housing web 22.

As can be seen by reference to FIGURE 7, upward movement of the rod 24 (assuming FIG. 7 represents the holding plate situation) tends to lift the left hand end of the holding plate, thus making the holding plate more horizontal and permitting upward movement of the rod through the collar. However, when the lifting plate 71 completes its upward stroke and starts downwardly, the left hand end of the holding plate 96 drops slightly downwardly (owing to the spring 99) and into the position shown in FIGURE 7 in which the lips are in biting or binding engagement with the rod.

Thus, in successive fashion, the lifting plate lifts the rod, the rod being held by the holding plate during the period in which the lifting plate returns to base position.

FIGURE 6 illustrates the manner in which the rod, tube and cap are all returned quickly to base position. By depressing the lever 76, the left-hand end 72 of the lifting plate is urged upwardly into elevating engagement with the left-hand end 98 of the holding plate. This causes the holding plate to assume a substantially horizontal attitude, removes the lips 88 and 89 from binding engagement with the rod and permits immediate return of the rod, tube and cap member to the lowered position shown in FIGURE 5 under urgency both of the spring 25 and gravity.

It can therefore be seen that I have provided a highly reliable and quick acting resilient jacking mechanism.

What is claimed is:

1. A movable wall mounting mechanism comprising:

(*a*) a housing adapted to be secured to a vertical movable wall;

(*b*) a vertical lifting rod translatably mounted on said housing, the upper end of said rod being disengaged from the ceiling above the wall in a lower first position of said rod and being in engagement with the ceiling in an elevated second position of said rod;

(*c*) a holding plate pivotally mounted adjacent one end thereof on said housing and including adjacent the other end an opening defined by walls encircling said rod with a clearance such that said rod is engaged by said opening walls in a first downwardly inclined attitude of said holding plate and is substantially clear thereof in a second substantially horizontal attitude of said holding plate;

(*d*) first spring means on said housing for biasing said holding plate toward said first attitude;

(*e*) a lifting plate pivotally mounted adjacent and removed from one end on said housing below said holding plate and including adjacent the other end an aperture defined by walls encompassing said rod with a clearance such that said rod is engaged by said aperture walls in a first downwardly inclined angle of said lifting plate and is substantially clear thereof in a second more nearly horizontal angle said other end of said lifting plate being engageable with said other end of said holding plate as said lift-

ing plate is tilted from said first angle toward said second angle;

(*f*) second spring means for biasing said lifting plate toward said first angle; and

(*g*) crank means connected to said one end of said lifting plate for elevating said one end of said lifting plate in a vertically upward direction of motion, and for upwardly tilting said other end of said lifting plate in a vertically downward direction of motion of said crank means, said downward motion of said crank means being effective to overcome the bias of said first and said second spring means and for urging said other end of said lifting plate into engagement with said other end of said holding plate and thereby moving said holding plate toward said second substantially horizontal attitude.

2. The device of claim 1 further characterized by third spring means interposed between the ceiling and said upper end of said rod for biasing said rod downwardly away from said ceiling, said third spring means being ineffective to resist the upward force exerted on said rod by said lifting plate and said lifting plate elevating means in said vertically upward motion of said crank means.

References Cited in the file of this patent

UNITED STATES PATENTS

1,125,713	Rellay	Jan. 19, 1915
1,499,755	Stebbins	July 1, 1924
2,217,403	Gunn	Oct. 8, 1940
2,227,397	Lucker	Dec. 31, 1940
2,893,470	Peller	July 7, 1959