Feb. 13, 1968 C. FAZEKAS ETAL 3,368,423

SELECTIVELY COLLAPSIBLE STAY ARM

Filed Nov. 17, 1965

FIG. 1.

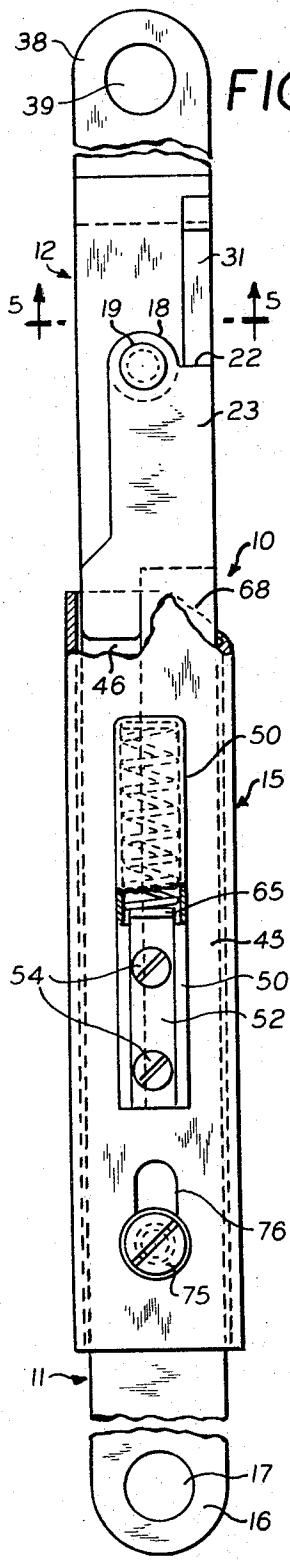


FIG. 2.

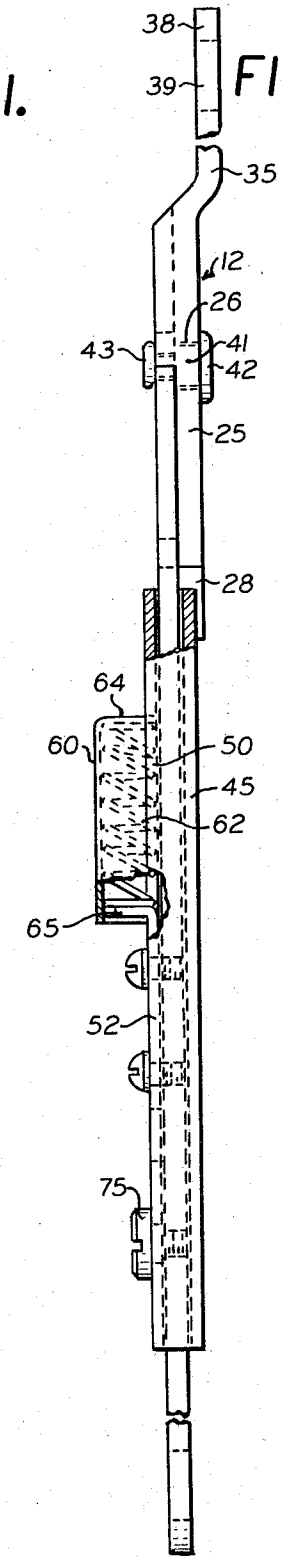


FIG. 3.

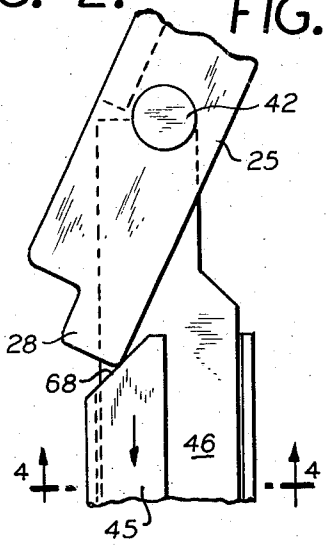


FIG. 4.

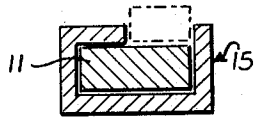
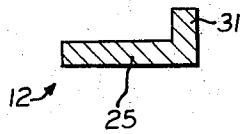


FIG. 5.



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SELECTIVELY COLLAPSIBLE STAY ARM

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ABSTRACT OF THE DISCLOSURE

A selectively collapsible stay arm formed by a pivotally interconnected body member and leg member with a locking sleeve telescopically arranged on said body member for longitudinal movement from a position overlying the body member to a position overlying both body member and leg member to secure said members in a fixed load supporting relationship.

Background of the invention

A variety of situations exist in which a collapsible stay armor strut is employed to support a shelf member, or the like, in a fashion permitting folding of the shelf member away out of operative position when desired. The supporting strut must be subject to collapse when it is desired to fold the supported surface out of operative position. Collapse of the strut should be attainable with minimum manipulative effort. However, the strut or arm when extended to supporting position must be sufficiently rigid and secure to provide desired support when the table surface or the like is arranged in operative position. It is desired that such stay arms or supporting struts automatically assume a distended operative supporting position when the table surface with which they are associated is lifted or otherwise arranged in operative position. Conversely it is desired that collapse of the strut be subject to attainment in a simple manner without requiring the exercise of particular skills. Previously evolved supporting struts of this type have presented problems in that the locking mechanism employed for maintaining the strut components in operative orientation to support a table surface are relatively expensive particularly when the loads supported are heavy. Where expense is avoided, the locking mechanism is often subject to failure. Other problems arise in that release of the locking mechanism to permit collapse of the table often results in a pinching of the fingers of the user.

Summary

It is with the above problems and desiderata in mind that the present improved stay arm or supporting strut has been evolved, a supporting strut of a simple nature permitting the use of relatively heavy structural components, so as to permit use of the strut for supporting relatively heavy loads, while providing a positive locking mechanism which prevents inadvertent collapse of the supporting strut, or conversely permits collapse in a simple fashion without endangering the hands of the user.

It is accordingly among the primary objects of this invention to provide an improved collapsible stay arm or strut particularly adapted for heavy-duty use.

Another object of the invention is to provide a collapsible stay arm or strut with a manually manipulable locking mechanism permitting manual manipulation without endangering the hands of the user.

A further object of the invention is to provide a collapsible stay arm or strut having a locking mechanism for maintaining the strut components in an operative supporting position with the locking mechanism automatically actuated as the stay arm components are oriented for use.

A further object of the invention is to provide a stay arm with a locking mechanism which though subject to relatively easy manual release is not subject to accidental or shock displacement.

These and other objects of the invention which will become hereafter apparent are achieved by forming a stay arm or strut assembly of two pivotally interconnected members. In the illustrated preferred embodiment of the invention, as will be hereafter more fully described, these members are of substantially equal length, and one of said members will be referred to as a body, while the other will be referred to as a leg. Slideably mounted on one of said members, preferably the body member, is a locking mechanism which is biased preferably by spring biasing to move to a limiting position engaging a part of the leg. The part of the leg which is engaged by the locking mechanism is in the form of a detent, and the locking mechanism is provided with a latch slot in which said detent is accommodated. A cam is formed at the entry end of the latch slot over which the detent will ride as pivotal movement takes place between the body and leg members. Thus as the body and leg members are pivoted with respect to each other so that the body and leg will assume an operative supporting orientation, the detent will be guided into the slideway for engagement by the locking mechanism in a positive fashion. Release of the detent from the locking slideway requires manual retraction of the locking mechanism against its spring biasing, thus freeing the detent, and simultaneously permitting pivoting of the body member with respect to the leg member.

A feature of the invention resides in the arrangement of the spring biasing element in a housing which forms a thumb engaging abutment on the locking mechanism which is dimensioned for ready manual gripping, so that release of the locking mechanism requires that the hands of an operator be positioned at a point preventing pinching of the fingers or any part of the hand.

Another feature of the invention resides in the provision of simple means for securing the locking mechanism in any desired position with respect to the leg or body members, so that the locking mechanism may either be deactivated, or may be maintained in a position preventing displacement of the locking mechanism, and collapse of the strut.

Brief description of the drawing

The specific details of a preferred embodiment of the invention, and their mode of functioning will be particularly pointed out in clear, concise and exact terms in conjunction with the accompanying drawings wherein:

FIG. 1 is a plan view of a stay arm or strut assembly made in accordance with the teachings of this invention, looking down at the thumb engageable spring housing, the illustrated strut being of the type normally used on the left-hand side of a downwardly pivoted table or shelf;

FIG. 2 is a side view looking at the structure shown in FIG. 1 from the right-hand side thereof;

FIG. 3 is a fragmentary view showing the pivot portion of the strut, looking at the structure shown in FIG. 1 from the obverse side shown in FIG. 1;

FIG. 4 is a cross-sectional view taken on line 4—4 of FIG. 3 illustrating the relationship between the locking sleeve, the body, and the leg; and

FIG. 5 is a cross-sectional view taken on line 5—5 of FIG. 1 showing the stop member.

Description of the preferred embodiment

Referring now more particularly to the drawings, like numerals in the various figures will be employed to designate like parts.

As best seen in FIGS. 1 and 2, the strut assembly **10** is seen to comprise three major cooperating parts in which the body member is generally designated by the numeral **11**, the leg member is generally designated by the numeral **12**, and the locking mechanism is generally designated by the numeral **15**.

Body member **11** is formed of an elongate strip of relatively rigid material such as steel or the like, and is preferably of rectangular cross-section, as best seen in FIG. 4. A free end **16** of body member **11** is rounded and provided with a pivot pin aperture **17**. The other end of body member **11** is pivotally connected to leg **12** and is referred to as pivot end **18**. Pivot end **18** is rounded and is formed with a pivot pin opening **19**. A shoulder **22** is formed on pivot end **18** which extends perpendicular to the plane of the body member **11**, and a transition area **23** of reduced cross-section is provided for a purpose to become hereinafter apparent.

Pivotally secured to the body member **11** is the leg member **12**, which as best seen in FIGS. 1 and 2 is similarly formed of an elongate rigid material, preferably of bar stock rectangular in cross-section. Leg **12** is formed with a pivot section **25** having a pivot hole **26** adapted for alignment with pivot hole **19** of body member **11**. Extending from this pivot portion **25**, as best seen in FIG. 3 is a detent **28**, preferably dimensioned of a cross-section less than that of the cross-section of the leg **12**. Upstanding from the plane of pivot portion **25**, on the side thereof contacting body member **11**, is a stop **31**, which as seen in FIG. 5 extends from the surface of pivot portion **25** a distance substantially equal to the thickness of body member **11**, and is of a width substantially equal to the width of shoulder **22**, as best seen in FIG. 1. Beyond the pivot portion **25**, leg member **12** is formed with an offset portion **35**, as best seen in FIG. 2, which is preferably offset from the plane of pivot portion **25** an amount equal to the thickness of leg member **12**. The free end **38** of leg **12** is rounded and is provided with a pivot pin opening **39**, as best seen in FIGS. 1 and 2.

Pivot pin **41** is extended between body member **11** and pivot portion **25** of leg member **12** by inserting the pivot pin through pivot apertures **19** and **26** respectively. One end of pivot pin **41** is provided with a head **42** and the other end is upset as at **43** to effect locking of the pin **41** in desired operative position.

Locking mechanism **15** comprises a sleeve **45** formed of sheet material such as steel or the like. Sleeve **45** is preferably dimensioned of a length such as to permit the hand of an average user to extend comfortably about the sleeve. A length between three and five inches is found particularly suitable. Sleeve **45** is formed with a detent slot portion **46**, as best seen in FIGS. 1 and 3, which is dimensioned to slideably accommodate detent **28**. The sleeve **45** is formed with a slideway **50**, preferably on the side thereof opposite slot **46**. A key **52** of an L-shaped configuration, as best seen in FIG. 2, is secured to body member **11** within slot **50**, the dimensioning of key **52** being such as to permit free movement of the slideway over the key. The key **52** in the illustrated embodiment is secured to body **11** by means of machine screws **54**. A spring housing **60** formed of sheet steel is welded to

the sleeve **45** over a part of slideway **50**. The length of slideway **50** is such as to accommodate therein compression spring **62** and key **52**. One end of housing **60** is closed to provide a thumb rest **64**, while the other end of housing **60** is open, with upstanding foot **65** of key **52** acting as a closure to contain spring **62** within the housing **60**. A cam surface **68** is formed on sleeve **45** adjacent the entry to slot **46**, so as to cooperate with detent **28**, as best seen in FIG. 3, and guide same into slot **46** while displacing the sleeve **45** against the biasing action of spring **62**.

A machine screw **75** is arranged in threaded engagement with body member **11** and the head end of the machine screw **75** extends through slot **76** formed in sleeve **45**, as best seen in FIGS. 1 and 2.

Operation

The aforedescribed stay arm or supporting strut assembly **10** may be employed in any of a large variety of situations where it is desired to provide a collapsible supporting member. Thus when it is necessary to provide support for a foldaway shelf or table, one or more strut assemblies of the type here disclosed may be employed. Additionally the strut assembly or stay arm may be employed in connection with a vertically hinged member such as a door to maintain the door in an open position.

In use, it is preferred to pivotally secure one end of the strut assembly between a wall of the member to which the shelf is hinged, and pivotally secure the other end of the strut to the shelf. It will be understood that the strut is arranged at a distance from the hinge point of the shelf, table, or door which is being supported so that the pivot connections between the ends of the strut and the shelf and cabinet respectively form an isosceles triangle, or a slide pivot is formed at one of the pivot connections in the event that this isosceles arrangement cannot be obtained. The strut is arranged with the housing **60** extending outwardly of the strut. Thus the illustrated stay arm or strut is of a left-hand type in which it is intended that the left hand of the user be employed to grip the sleeve **45**, with the thumb of the user bearing against thumb rest **64**.

When the shelf in connection with which the stay arm is employed is brought to an operative position, leg member **12** will pivot with respect to body member **11** about pivot pin **41** until detent **28** contacts cam surface **68** of sleeve **45**, as best seen in FIG. 3. Continued movement of the detent against cam **68** displaces sleeve **45** against the biasing action of spring **62** until the detent is aligned with latch slot **46**, at which time the biasing action of the spring **62** causes the sleeve **45** to assume the position illustrated in FIG. 1 securely locking leg **12** in an extended operative position with respect to body member **11**. In order to prevent detent **28** from overriding the entry to detent slot **46**, stop **31** engages shoulder **22** to limit the relative pivoting between leg **12** and body **11**.

Thereafter when it is desired to close the shelf, which necessitates collapse of the stay arm **10**, the sleeve **45** is gripped with the thumb resting against thumb rest **64**. By pulling on the thumb rest **64** sleeve **45** is retracted to release detent **28** and the application of manual pressure transverse to the axis of body member **11** results in a pivoting of the body member with respect to the leg member to cause collapse of the strut. In collapsed position the stop **31** folds into the space provided by the reduced cross-section of transition area **23**.

The above disclosure has been given by way of illustration and elucidation, and not by way of limitation, and it is desired to protect all embodiments of the herein disclosed inventive concept within the scope of the appended claims.

What is claimed is:

1. A stay arm comprising a leg member pivotally connected to a body member; an end projecting portion of said leg member providing a detent portion; locking means including a sleeve telescopically arranged on said body

member for longitudinal movement; a cam on said sleeve cooperating with said detent portion on said leg member; and a detent slot portion on said sleeve engaging said leg member projecting detent portion.

2. A stay arm as in claim 1 having: a spring mounted between said body member and said sleeve for yieldably urging said sleeve in a direction towards said pivot connection between said leg and body members.

3. A stay arm as in claim 2 in which: a housing is formed on said sleeve within which said spring is mounted; and a thumb rest on said housing; said housing having a slideway; and a key in said slideway guiding said sleeve.

4. A stay arm as in claim 1; further comprising manually operable means for selectively fixing said sleeve with respect to said body, said manually operable means comprising a fastener threadably engageable with said body and extending through a slot provided in said sleeve to fix the locking means with respect to the body member.

5. A stay arm as in claim 1 in which said slot portion of said locking means has an entry end adjacent said cam.

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