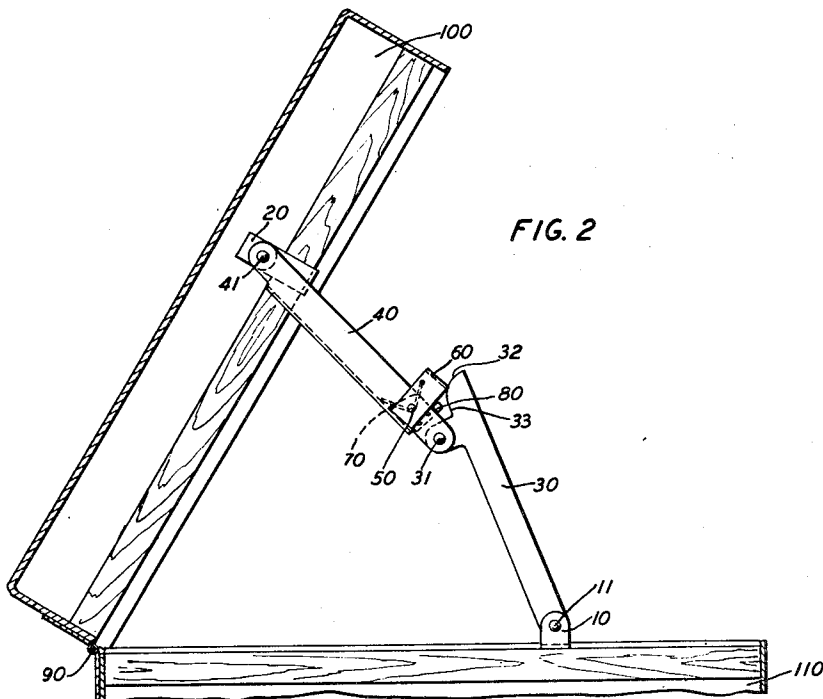
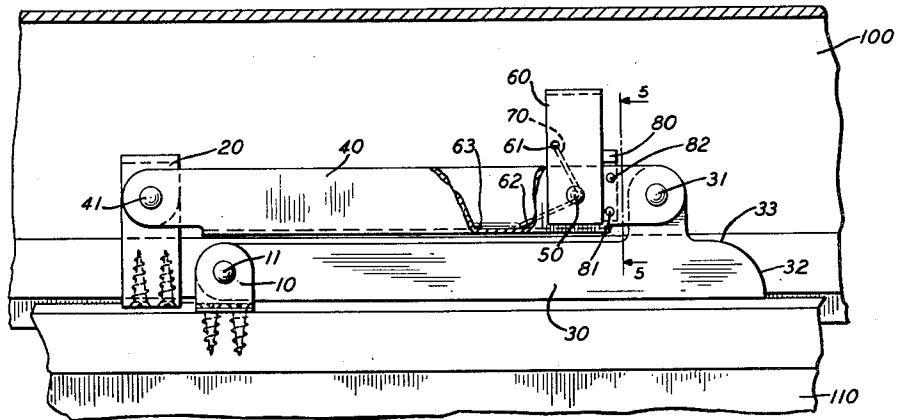


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FIG. 1



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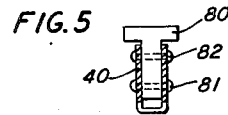
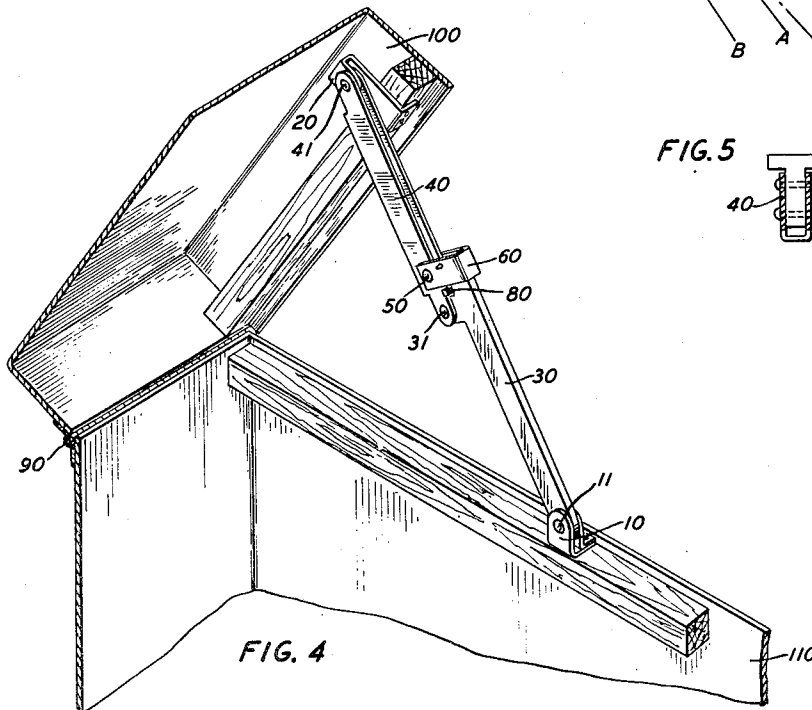
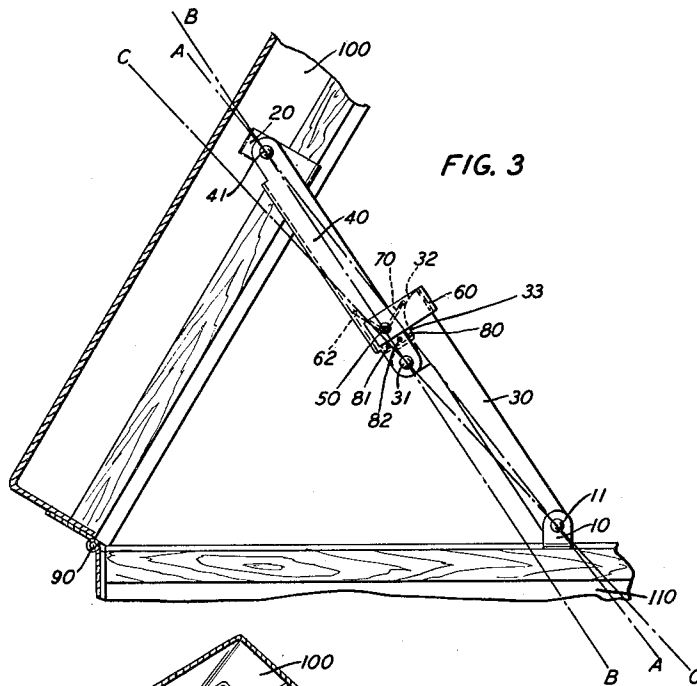
July 18, 1950

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HINGED BRACE

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2 Sheets-Sheet 2



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HINGED BRACE

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5 Claims. (Cl. 217-60)

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This invention relates to hinged braces for use in connection with articles such as furniture, shelves, cabinet lids and ladders.

An object of this invention is to provide a folding brace that will automatically lock itself to prevent fold-up when it is fully unfolded.

Another object of this invention is to provide a brace of substantial strength to safely support a considerable longitudinal thrust when it is locked in the fully unfolded condition.

Still another object of this invention is to provide a brace in which the latch that locks the brace when fully unfolded must be released manually to permit collapse or foldup.

A further object of this invention is to provide a brace in which the mechanical forces, in effect when the brace is fully unfolded and it is supporting a load, are in a direction to assist in holding the brace safely extended.

A still further object of this invention is to provide a brace which is inexpensive, simple in construction and effective in use and which is applicable to hinged shelves, tables with folding legs, folding step-ladders, and trunks, cabinets or boxes with hinged lids and other uses where two members are hinged together in a manner to permit unfolding into a spread relation or folded up into a collapsed relation.

Other objects will become apparent during the course of the following description and in the appended claims.

The preferred embodiment of this invention as illustrated in the drawings is a brace which consists of two arms pivoted together and having hinged brackets at the outer ends of the two arms for attaching the brace to the articles to which the brace is to be applied. A stop is provided on one of the arms which prevents the two arms unfolding about their common pivot beyond a substantially parallel relation when extended. A spring pressed latch is also provided on this arm. An end of the other arm of the brace extends beyond the common pivot point and is shaped and positioned to engage the latch when the two arms are unfolding and approaching a fully unfolded relation. This cam end rotates the latch out of the path of the cam until this arm is substantially parallel and in fully extended relation with the first arm. Slightly before the arms become parallel, the cam releases the spring pressed latch allowing it to automatically return to its normal position at rest against the stop in which position it straddles the extended cam end of the second arm to prevent

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the rotation of either arm about their common pivot until the latch is operated by hand.

When the brace has been fully unfolded to its extended condition with the projecting cam end of the second arm pressing against the stop on the first arm, the forces acting between the outer ends of the arms result in a force operating on the common pivot of the two arms of the brace which is in a direction urging the extended end of the second arm more firmly against the stop on the first arm. This force acts to assist in holding the brace safely extended so that increase of load on the brace always tends to urge it to stay extended and to prevent collapse.

This embodiment of the invention is an arrangement of elements that provides a strong and safe brace capable of supporting a considerable thrust lengthwise between its supporting brackets when fully unfolded and locked by the latch.

Although the preferred embodiment as illustrated in the drawings is shown attached to a cabinet and the hinged lid of the cabinet, its use is not limited to this application. The device also may be applied to hinged step-ladders, hinged shelves, and various other articles that have two members hinged together in a manner that permits folding and unfolding of the members, and that require a locking brace to safely hold them in an unfolded relation.

A more complete understanding of the invention may be obtained from the detailed description that follows when read in connection with the accompanying drawing in which:

Fig. 1 is a side elevation view of a portion of a cabinet and its lid in partial section showing the lid closed and the brace folded.

Fig. 2 is a side elevation of a portion of the lid and the top portion of the cabinet showing the cabinet lid raised part way with the brace nearing its extended condition with its cam making contact with the latch;

Fig. 3 is a similar side elevation of a portion of the lid and a portion of the cabinet showing the lid raised and the brace fully extended and locked in this condition by the latch;

Fig. 4 is a perspective view of a partial section of a cabinet and its lid showing the cabinet lid raised and the brace in its fully extended condition with the latch locking it in this condition; and

Fig. 5 is a detail drawing of the stop bar of the brace.

With reference to the drawings, the application and the character of the components of the

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preferred form of brace in accordance with this invention are shown. In Fig. 1 is shown a plan view of a part of a cabinet 110 and a part of the lid 100 thereof. The brace is attached to the cabinet 100 by bracket 10 which is attached to the cabinet by screws, and is shown in folded condition. The brace is attached to the lid of the cabinet 100 by bracket 20 which is attached to the lid by screws. Arms 30, 40 of the brace are pivoted together with pintle 31. Arm 30 is a bar type of arm and is pivoted to bracket 10 by pintle 11. Arm 40 is shown partly in section and has a U-shaped or channel type cross-section and is pivoted to bracket 20 by pintle 41. Arm 40 has a stop 80 fastened to it by rivets 81, 82, shown in detail in Fig. 5. Arm 40 also carries a U-shaped latch 60 hinged thereon by pintle 50. Latch 60 is pressed against stop 80 by a wire spring 70 which has one end bent at right angles to its shank with this end inserted in a hole 61 in one side of latch 60. Wire spring 70 is spring steel and is wrapped around pintle 50 and its other end 62 presses against the bottom 63 of the channel in the U-shaped arm 40. Spring 70 is in compression between its ends at 61, 62 when in the position shown in Fig. 1 thus tending to press latch 60 against stop 80. Arm 30 extends beyond pivot 31 and has a cam-shaped end 32.

Fig. 2 shows cabinet 110 and lid 100 which are attached by hinge 90. Lid 100 is shown opened to an angle approaching the limiting angle permitted by the brace when fully unfolded. The cam end 32 of arm 30 is shown in contact with latch 60 and has moved the latch 60 slightly away from contact with stop 80 against the pressure of spring 70. Pressure exerted against arm 30 by external force or by raising lid 100 further than shown in Fig. 2 will cause cam 32 to push latch 60 aside further and permit the two arms 30, 40 to align themselves in substantially parallel relation as shown in Fig. 3. When arms 30, 40 become almost parallel, cam 32 releases spring pressed latch 60 which restores itself into contact with stop 80 by overriding the cam end 32 of arm 30. In this relation of elements face 33 of arm 30 strikes stop 80 to prevent rotation of arms 30, 40 about pintle 31 in one direction of rotation and latch 60 prevents rotating action of arms 30, 40 about pintle 31 in the other direction. Thus the brace is securely locked in its extended condition.

It will be seen by reference to lines AA, BB, and CC in Fig. 3 that pivot point or pintle 31 lies to one side of line AA which is drawn between centers of pivot points 19, 20 at the outer ends of the two arms 30, 40. Therefore, when force, for example, by the weight of the cabinet lid 100, is exerted longitudinally along arm 40 of the fully extended brace in a direction shown by line BB there will also be force along line CC and a component of these two forces will act in a direction to urge face 33 of arm 30 more firmly against stop 80 and the greater the weight of the cabinet lid the greater will be this force tending to hold the brace in its extended condition.

To allow lid 100 to close upon cabinet 110 and fold up the brace from its fully extended condition it is necessary to manually rotate latch 60 in a direction away from contact with stop 80 and against the compression of spring 70 and manually rotate arms 30, 40 about pintle 31.

While the features of this invention have been disclosed with reference to a specific embodiment only, it is, of course, understood that various modifications may be made in the details of con-

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struction without departing from the scope of this invention as defined in the appended claims.

What is claimed is:

1. A brace for the cover of a cabinet comprising a bracket for fixation to the cabinet, an arm pivoted at one end on said bracket, a U-shaped latch member pivoted on said arm adjacent the opposite end thereof, a stop element carried by said arm for limiting the angular movement of said U-shaped member in one direction, a spring for resiliently holding said U-shaped member against said stop, a bracket for fixation to the cover of the cabinet, another arm having one of its ends pivoted to the last mentioned bracket and its other end to the free end of the first-mentioned arm, and a cam formed of the second-mentioned arm for operating said U-shaped latching member against the tension of said spring to cause the automatic movement of said member for engaging said cam upon the pivotal movement of the cover into the open position for locking the latter in that position.

2. A metallic folding or hinged brace comprising a mounting bracket, an arm formed in a U-shaped cross-section with two parallel projecting prong extensions at each end, said arm being pivotally attached or hinged to said bracket at a point substantially at the center of the prongs at one end of said arm, a second arm formed of a solid bar with a lateral projection on one side near one end thereof, said projection being inserted between the projecting prongs at the opposite end of said first arm and pivotally attached or hinged thereto by a pintle substantially at the centers of said prongs and said projection, a second mounting bracket pivotally attached or hinged to said second arm at its opposite end, a U-shaped spring-pressed latch bridging and pivotally attached to said first arm at a point near the said opposite end of said first arm, a bar, stop or lug mounted transversely across the narrow face of said first arm at a point between the U-shaped latch and the pivotal attachment point of said first and second arms to prevent said first and second arms unfolding beyond extended parallel relation to each other and to prevent said latch being rotated by its spring beyond a position substantially at right angles with said first arm, and a cam-shaped end on said second arm extending beyond the pivotal point of attachment of said first to said second arms to engage and rotate said latch away from contact with said lug when said first and second arms are unfolded into parallel alignment, said latch spring causing said latch to rotate over the cam-shaped end of said second arm after both said arms are extended to a substantially parallel relation thereby locking said arms in extended parallel relation to prevent collapse or foldup of said brace.

3. A jointed brace comprising two arm sections, the first arm-section having a lateral projection near one end and pivoted to one end of the second arm section at a point on said lateral projection for folding one arm upon the other, a pivotally attached mounting bracket at the outer or free ends of each arm section, a cam-shaped end of the first arm section projecting beyond the pivot point of attachment of the two arm sections, a stop member across one edge of said second arm section but near the point of pivot of said first and second arms to prevent unfolding said arms beyond a substantially parallel relation when extended and a spring-pressed latch pivoted to the

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second arm section at a point between said stop member and mounting bracket end of said first arm section but positioned to be pressed against said stop member and substantially at right angles to said first bar member and having a lateral portion in the path of said cam-shaped end of said second arm section, said cam-shaped end of said first arm section shaped and positioned to cause it to rotate said latch away from engagement with said stop member when said brace is unfolding but permitting said latch to restore itself to a position at rest against said stop member but over said cam end of said first arm section after the said two arm sections are unfolded fully to an extended substantially parallel relation to prevent collapse or foldup of said brace.

4. A folding brace comprising a first elongated arm member, a second elongated arm member having a lateral projection near one end, two mounting members, one of said mounting members being pivoted at one end of said first arm member, the other of said mounting members being pivoted on said second arm member at the end opposite the lateral projection end thereof, said first and second arm members being adjacent and joined about a common pivot near the center of said lateral projection on said second cam member and near the end of said first arm member opposite the mounting bracket end, said second arm member having a cam-shaped end portion extending beyond said common pivot point, a stop member across the narrow face of said first arm member shaped and positioned to prevent the extending end portion of said second arm member rotating about said common pivot to unfold beyond a position extending in substantially parallel relation to said first arm member, a latch member pivotally attached to said first arm member adjacent to said stop member between said stop member and the mounting end of said first arm member and having a protrusion in the path of said cam-shaped end portion of said second arm member when said second arm member is unfolding about said common pivot, and a spring member positioned to resiliently hold said latch member in contact with said stop member, said cam-shaped end portion of said second arm member shaped and positioned to rotate said latch member away from engagement with said stop member while said brace is approaching a fully unfolded condition, said spring member causing said protrusion

sion of said latch member to position itself over said cam-shaped end portion of said second arm member when said brace is fully unfolded to a position in which said first arm member and said second arm member are extended into substantially parallel relation to prevent collapse or fold-up of said brace.

5. A brace comprising a pair of links pivotally connected to lie in substantially parallel relation when the brace is either collapsed or fully extended, the pivotal connection being near the lower end of the upper link and at a point near the center of a lateral projection which is near the upper end of the lower link, said links being adapted at their outer ends for pivotal connection to the parts to be braced, the upper link having a stop on one edge near its lower end adapted to prevent rotation of the two links about their common pivot beyond substantially parallel relation when unfolding, a spring pressed latch pivoted on said upper link near the lower end thereof, and above said stop and normally pressing against said stop, and a cam-shaped end extending above the common pivot point on the upper end of the lower link adapted to engage a lateral projection on said latch and to rotate said latch away from contact with said stop when said brace approaches its fully unfolded condition and to allow said latch to automatically resume a position against said stop with its lateral projection overriding the extending end of said lower link to lock the two links in substantially parallel extended relation when said brace is fully unfolded and prevent collapse or foldup of said brace.

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