

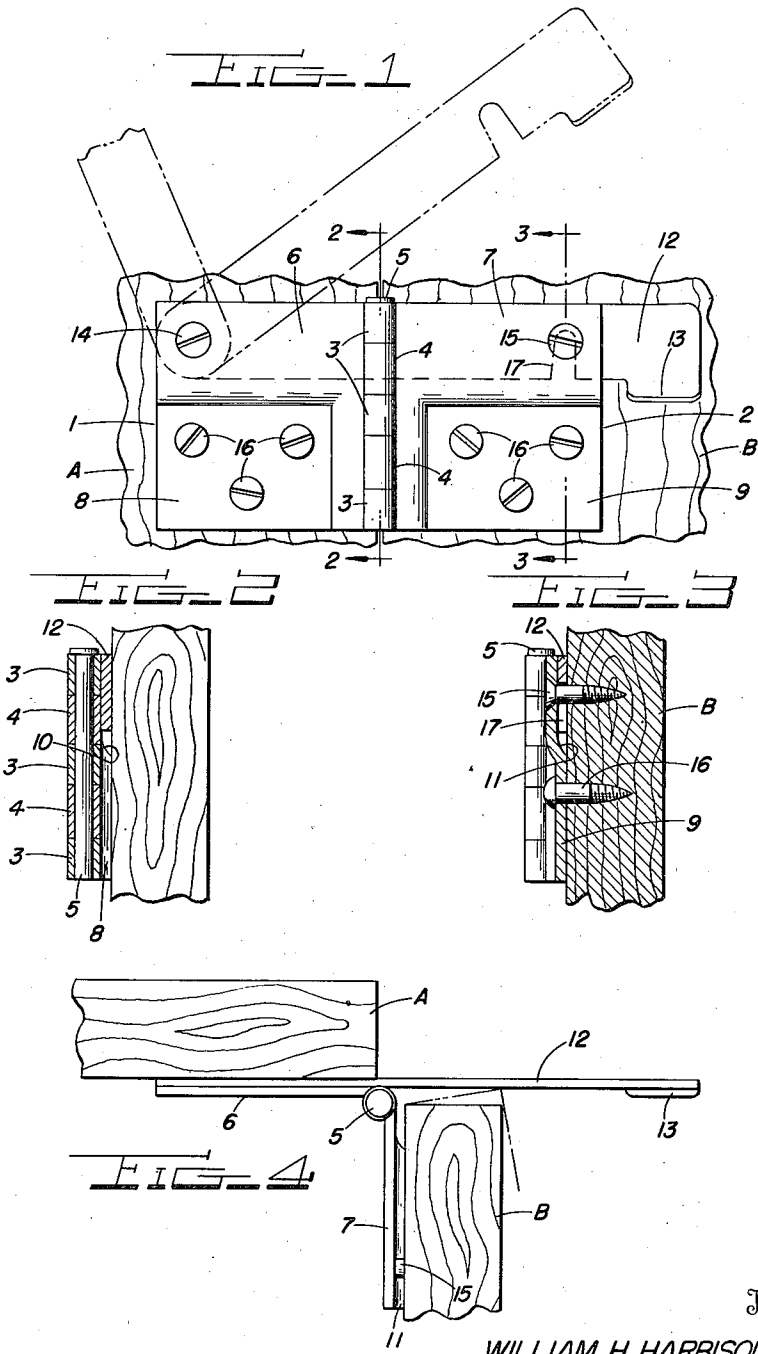
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LOCK HINGE

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LOCK HINGE

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This invention relates to lock hinges for connecting various rigid members for relative swinging movement and operable to prevent or limit the swinging movement thereof; hence is adapted for a wide variety of uses, being particularly adaptable for use in collapsible furniture, as well as in the mounting of doors or other closures.

The primary objects of the invention are: to provide a lock hinge having a locking element associated in a novel and highly useful manner both with the hinge and with the rigid members to which the hinge is applied, to cooperate therewith in alternative ways; to provide a hinge lock in which the locking element is frictionally retained in any desired position; to provide in such a hinge a simplified and efficient means for mounting said locking element and adjustably urging other parts of the associated hinge structure into frictional engagement therewith; and, to provide frictional adjusting means associated with the hinge plates or leaves which may be engaged by the locking element in one of its operative arrangements to supplement the locking action thereof.

The preferred embodiment of the invention by which the above objects are attained is illustrated in the accompanying drawings, in which:

Figure 1 represents a plan view of the preferred embodiment of the invention in which the locking element is designated in full lines in its operative position, and in broken lines in its partially retracted and fully retracted or inoperative positions respectively, the showing of the locking element in fully retracted position being fragmentary.

Figure 2, a cross-section on the line 2-2 of Figure 1, looking in the direction of the arrows;

Figure 3, a cross-section on the line 3-3 of Figure 1, looking in the direction of the arrows; and,

Figure 4, a side elevation of Figure 1, showing the rigid members swung at an angle to each other and maintained in relatively angular positions by the locking element or lever.

Referring now in detail to the accompanying drawings, the reference characters A and B respectively designate portions of suitable rigid members (shown fragmentarily), such as a door and door frame, or relatively foldable parts of collapsible furniture, which are connected together in edge to edge relationship by the lock hinge of the invention for relative swinging movement.

The lock hinge associated with members A and B comprises a pair of rigid, preferably sheet metal

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hinge plates or leaves, respectively designated 1 and 2 in their entireties. Pivotally connecting the adjacent transverse edges of the hinge plates 1 and 2 for relative swinging movement of said plates about a transverse axis, is a suitable hinge joint, which may consist of the usual transversely or axially aligned interlapping hinge knuckles 3 and 4 integral with the respective plates 1 and 2, and a pintle 5 extending axially therethrough. In such construction, the knuckles 3 and 4 project from the forwardly presented or front faces of their respective plates 1 and 2 to leave the rear surfaces thereof of smooth, substantially flat configuration.

The hinge plates 1 and 2 are formed with laterally or transversely coextensive flat locking flanges or portions 6 and 7 respectively, formed along the upper longitudinal edges of the two hinge plates.

These locking flanges 6 and 7, as well as the knuckles 3 and 4 of the hinge joint, are supported in spaced relation from the adjacent faces of the respective members A and B by attaching portions 8 and 9 having relatively rearwardly offset rear faces or surfaces secured flush against the front faces of the respective members A and B by suitable means, such as the screws 16, passing through holes in the attaching portions into the members A and B.

In the preferred form of the invention wherein the hinge plates are formed from sheet metal, by usual sheet metal stamping and bending operations, the entire attaching portions 8 and 9 are offset rearwardly from the hinge knuckles 3 and 4 and locking flanges 6 and 7 respectively, such offsetting producing longitudinally extending shoulders 10 and 11 on the rear faces of the respective plates 1 and 2, at the juncture of the attaching portions 8, 9 and flanges 6, 7 thereof.

A rigid, preferably heavy gauge sheet metal bar or locking lever 12 is pivotally mounted between one of the locking flanges 6 and its associated member A by a suitable pivot element which preferably consists of a pivot screw 14 passing through said flange 6 into threaded engagement in the member A. The pivot element may be a headed stud riveted to flange 6 and supported entirely by this flange.

The locking lever 12 may be manually swung in the plane between the adjacent faces of member A and flange 6, and is limited in its swinging movement in one direction by one or both of the shoulders 10 and/or 11, which serve to accurately position the lever in operative position.

In order to facilitate its manipulation, the le-

ver 12 may be provided with a forwardly projecting finger grip or lip 13 at its free end, the lever being of such length that when in locking position, as shown in Figure 1, to maintain the members A and B in relative alignment, the free end of the lever 12 and the grip 13 carried thereby will project longitudinally beyond the hinge plate 2 to be easily accessible.

In order to supplement the locking action, lever 12 is provided at its free end portion with a locking recess 17 adapted to receive a friction adjusting screw 15 when in the position shown in Figure 1 to maintain the members A and B in alignment. However, while the screw 15 and locking recess 17 are desirable and easily incorporated features, these may be omitted without rendering the invention inoperable.

The pivot member or screw 14 and the screw 15, in addition to performing the function above noted, may also be rotated to urge their respective flanges 6 and 7 into any desired degree of frictional engagement with the locking bar or lever 12, and to similarly cause such engagement between said lever and the members A and/or B, it being noted that both screws 14 and 15 are embedded in the respective members A and B in threaded engagement therewith, and that their heads abut against the forwardly presented surfaces of the flanges 6 and 7.

It will be understood that the plates 1 and 2, while normally rigid and of considerable strength, will preferably be formed of sheet metal such as brass or other suitable material which is slightly yieldable under the pressure of the screws to permit them to urge the flanges 6 and 7 towards the members A and B respectively, and the lever 12 is of such thickness as to occupy the space between the flanges 6 and 7 and the members A and B respectively.

Thus, when the lever 12 is swung into the operative position shown in Figure 1 to maintain the members A and B in relative alignment, it will extend across the adjacent edges of the members A and B and rearwardly of the flanges 6 and 7 and the hinge joint formed by the knuckles 3 and 4, and will be frictionally engaged and retained between the flanges 6 and 7 and their associated members A and B.

And, when in the operative position shown in Figure 4, the lever 12 will be retained in position by frictional engagement between the flange 6 and member A.

Thus, it will be seen that the lock element or lever 12 will not be affected by gravity and accordingly the lock hinge may be applied or placed in any position desired.

In the operation of the invention, when it is desired to permit free or unrestricted swinging movement between the members A and B, the locking lever 12 may be swung or retracted from its operative position as shown in Figures 1 and 4, to an inoperative position such as is shown fragmentarily in broken lines in Figure 1, wherein its free end is out of engagement with the member B. It will be maintained in this position by frictional engagement between or with the flange 6 and member A.

When it is desired to maintain the members A and B in relative fixed positions in relative alignment, the locking lever 12 is placed in inoperative position as above described, while the members A and B are swung relative to each other into alignment, whereupon the lever is swung towards and into abutment with the stop shoulders 10 and 11 to lie in a longitudinally extend-

ing position, as shown in full lines in Figure 1, wherein it extends across the adjacent edges of the members A and B in engagement with the faces of both members, and is frictionally retained in this position as hereinbefore mentioned. In this position the rigid bar or lever 12 is maintained flush against the faces of the members A and B and, by its resistance to bending, prevents relative swinging movement between the members A and B. Where the element 12 is provided with the recess 17 to receive and engage the screw 15, as hereinbefore described, such engagement supplements the locking action produced by resistance of the lever to bending, since in this arrangement the lever acts as a rigid compression brace or member extending between the two screws 14 and 15 to prevent movement of one towards the other, as would have to occur were the members A and B to swing out of relative alignment.

When it is desired to maintain the members A and B in relatively angular positions, or to limit the swinging movement thereof, as in Figure 4, the locking element 12 is placed in inoperative or retracted position as above described while the members A and B are swung sufficiently to permit the lever 12 to swing between the members A and B past the edge of member B and into its longitudinally extending position in engagement with the stop shoulder 10. After being thus positioned, the lever 12 will abut against the edge of the member B to prevent this member from swinging back towards a relatively aligned position with member A.

The locking bar or lever 12 may be strengthened against bending by providing an outwardly extending flange along its upper edge and throughout its length. In locking position of the lever, this flange would extend over the upper edges of flanges 6 and 7 of the hinge, and this flange might serve the function of lip 13 which could be omitted.

I claim:

1. A lock hinge assembly for connecting a pair of rigid members for relative swinging movement and operable to maintain them in relatively fixed position, said lock hinge comprising a pair of hinge plates pivotally connected for relative swinging movement about a transverse axis, said plates being secured to said respective members and formed with transversely coextensive locking flanges supported in spaced parallel relationship to the adjacent faces of said members, and screws passing through said locking flanges into threaded engagement with their respective members, in combination with a locking lever pivotally mounted on one of said screws between its associated flange and member for swinging movement in a plane parallel thereto, said locking lever being formed at its free end portion with a recess to receive said other screw.

2. A lock hinge assembly for connecting a pair of rigid members for relative swinging movement and operable to maintain them in relatively fixed position, said lock hinge comprising a pair of hinge plates pivotally connected for relative swinging movement about a transverse axis, said plates being secured to said respective members and formed with transversely coextensive locking flanges supported in spaced parallel relationship to the adjacent faces of said members, and a locking lever pivotally mounted on the rear face of one of said flanges and being swingable in a plane parallel thereto and into a position where the free end thereof enters the recess

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formed between the other flange and its associated member.

3. A lock hinge for connecting rigid members for relative swinging movement and operative to maintain said members in relatively fixed position comprising, a pair of sheet metal hinge plates pivotally connected at their adjacent transverse edges for relative swinging movement about a transverse axis, said plates being formed with transversely coextensive locking flanges adjoining corresponding longitudinal edges thereof on opposite sides of said pivotal connection, and having rearwardly offset attaching portions adjacent said flanges and adapted to be secured to said members to support said locking flanges and said pivotal connection in spaced relation thereto, said attaching portions adjoining said locking flanges along longitudinally extending shoulders, in combination with a locking lever pivotally mounted rearwardly of one of said locking flanges for swinging movement parallel thereto in a plane behind the pivotal connection of said plates to abut against said shoulders rearwardly of both locking flanges.

4. A lock hinge for connecting rigid members for relative swinging movement and operative to maintain said members in relatively fixed posi-

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tion comprising, a pair of hinge plates pivotally connected at their adjacent transverse edges for relative swinging movement about a transverse axis, said plates being formed with transversely coextensive locking flanges adjacent corresponding longitudinal edges thereof on opposite sides of said pivotal connection, and having rearwardly offset attaching portions adjacent said flanges and adapted to be secured to said members to support said locking flanges and said pivotal connection in spaced relation thereto, in combination with a locking lever pivotally mounted rearwardly of one of said locking flanges for swinging movement parallel thereto in a plane behind said flanges and behind said transverse axis.

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