HEAVY DUTY HINGE

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References Cited

UNITED STATES PATENTS
944,001 12/1909 Sheafor 16/162
723,973 3/1903 Alexander 16/162
1,079,215 11/1913 Conners 16/162

FOREIGN PATENTS OR APPLICATIONS
17,494 4/1904 Austria 16/162

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ABSTRACT

A hinge adapted to connect a pair of massive elements intended to be pivotally secured, one of which is operatively stationary, is disclosed. The hinge includes a pair of flat outer plates and a flanged middle plate sandwiched therebetween. The three plates are pivotally fastened to each other by a pin or shaft extending through interlaced curled sections formed along juxtaposed edges of the respective plates. One of the outer plates is mounted on the operatively stationary element while the other outer plate and the flanged plate are secured to the movable element.

7 Claims, 2 Drawing Figures
HEAVY DUTY HINGE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention generally relates to hinges of the type used for pivotally connecting two physical bodies that are generally planar in shape. More specifically, the present invention concerns a heavy duty hinge that is particularly suitable for pivotally securing a pair of massive elements wherein one element remains operatively stationary and the other element is operatively pivoted upward along a generally horizontal axis.

2. Description of the Prior Art

A common form of hinge that has existed in the prior art for many years includes a pair of plates, flaps, straps, or the like, which are pivotally connected by a pin extending through interlaced finger sections on the respective plates, etc. Elements that are to be held together by the hinge, or hinges, are customarily fastened to different sides of the respective plates.

The problem of pivotally securing a pair of massive elements, which are not only large but also heavy, has usually been solved by simply fabricating a hinge proportionally larger and bulkier. In the case of gates, doors, or the like such a solution is not only acceptable but oftentimes encouraged for decorative purposes. However, when it is undesirable to significantly increase the size and weight of a hinge and the axis about which a movable element is to be pivoted is not vertically oriented, the simple solution of increasing the size of a hinge becomes unsatisfactory. For example, not only does the strength of the hinge become critical, but the ease with which the hinge is capable of being mounted may become a critical factor.

Accordingly, it is the intention of the present invention to provide an improved hinge that is, by design, capable of firmly securing a pair of massive elements while allowing these elements to be pivoted about a horizontal axis as well as an axis of some other orientation. Further, the present hinge by its design enables massive structural elements to be readily fastened to individual parts of the hinge.

SUMMARY OF THE INVENTION

Briefly described, the present invention involves a heavy duty hinge which is capable of securing and supporting a pair of massive elements that are to be pivoted about a non-vertical axis.

More particularly, the subject hinge includes a pair of flat outer plates and a flanged middle plate sandwiched therebetween. The individual plates, which may be of any generally uniform length to accommodate the elements being pivotally connected, are respectively intercoupled along juxtaposed longitudinal edges. The plates are intercoupled by a pivot pin extending through a pivot pin channel formed by interlaced curved sections situated on edges of the respective plates. One of the outer plates is adapted to be fastened to or mounted on an operatively immovable one of the two elements to be secured. The other outer plate and the flanged middle plate are adapted to be fastened to the element, or elements, intended to be pivoted.

The objects and many attendant advantages of the invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description which is to be considered in connection with the accompanying drawings wherein like reference symbols designate like parts throughout the figures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric diagram illustrating a partially fragmented, exploded perspective view of the present invention;

FIG. 2 is an isometric diagram illustrating a partially fragmented, perspective view of a pair of elements pivotally secured by a hinge in accordance with the present invention; and

FIG. 3 is a schematic diagram illustrating a cross-sectional end view of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

Referring to FIG. 1 of the drawings, a heavy duty hinge, in accordance with the present invention, includes a pair of flat outer plates 10 and 12. A middle plate 14 having a flange 16, which generally extends at right angles thereto and along one longitudinal edge thereof, is interposed between the outer plates 10 and 12. As shown, the other longitudinal edge 18 of the middle plate 14 is aligned with a longitudinal edge 20 and 22 of the outer plates 10 and 12, respectively. The longitudinal edges 18, 20 and 22 are each equipped with a series of curled finger segments 24 which are sized and interspaced to allow a single straight pivot pin 26 to extend through each of the pin channels 28 formed by the respective finger segments 24.

Each of the plates 10, 12 and 14 should be fabricated with a physically strong material such as steel or some other material that is sufficiently strong to accommodate the particular pair of elements to be hinged. The length of each of the plates forming a hinge should generally be uniform. However, varying lengths can be employed to meet special requirements.

Any conventional means of fastening the individual plates 10, 12 and 14 to structural elements may be employed. For example, the plates may be provided with apertures 29 through which screws, or the like, may be extended into the elements to be hinged. Where metal structural elements are involved, the individual plates 10, 12 and 14 may even be welded to the elements to be secured thereto.

The present invention has been found to be particularly suitable for use with massive structural elements of considerable weight which are to be hingeably secured and pivoted about a horizontal axis. As an example, such large structural elements may be employed in prefabricated structures that are adapted to be partially collapsed by raising side floor panels to vertical positions when the prefabricated structure is moved, i.e., to a building site. Similar pivoted elements might be found on draw bridges, loading ramps for rail cars, etc. This particular suitability of the present invention is attributable to the structural security provided when the pivotable element is raised to a vertical position and to the facility with which the hinge can be mounted. These particular attributes have been found to be unexpectedly produced by the operative combination of the three plates 10, 12 and 14, working in conjunction with each other, and can best be explained with an operative example.
Referring to FIGS. 2 and 3, assume that a structural floor element 30, which is intended to be operatively immovable, is to be hinged to another structural floor element 32 which is to be pivoted between horizontal and vertical positions as depicted in FIGS. 2 and 3 respectively. The outer plate 10 may be first attached to the immovable element 30. As earlier mentioned, screws or bolts may be used to secure the plate 10 to the structural element 30. Welding or the like may also be used.

The movable element 32 may now be mounted by being placed on the flange 16 and urged against the middle plate 14. The flange 16 serves to both align and support the element 32 during mounting, thereby eliminating the need for jacks, braces, or the like, which would have to be used to accomplish the same result. The flange 16 may be secured to the element 32 by welding, and/or with screws. The outer plate 12 is secured to the pivotable element 32 in any of the noted manners. The middle plate 14 may also be secured to the movable element 32 for extra security by raising the element 32 to a vertical position. As shown, a series of screws 34 may then be applied to the element 32 through the middle plate 14.

It has been found that use of the present invention provides structural security not able to be provided by conventional hinges, particularly when the movable element is in a vertical position. Where the elements 30 and 32 are, for example, parts of a prefabricated structure that is to be moved over public highways, this structural security becomes an extra important factor for obvious reasons.

The ease with which the present invention can be mounted on elements to be hinged provides the added advantages of savings in time and money, particularly where size and weight make the elements difficult to handle.

From the foregoing discussion, it is now apparent that the present invention provides an improved heavy duty hinge that is particularly useful for pivotally connecting massive elements of considerable weight and which are pivoted about a horizontal axis. It is to be understood, however, that the present invention is not limited to such use.

While a preferred embodiment of the present invention has been described hereinabove, it is intended that all matter contained in the above description and shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense and that all modifications, constructions and arrangements which fall within the scope and spirit of the invention may be made.

What is claimed is:

1. A hinge for pivotally connecting first and second planar members, said hinge comprising:
   first and second outer planar plates each having longitudinal edges;
a mid-support member having an L-shaped transverse configuration formed by a middle plate interposed between said first and second outer plates and having a flange extending perpendicular thereto along a longitudinal edge thereof, said first outer plate and said mid-support member in combination forming a channel having a U-shaped transverse configuration for receiving said first planar member for attachment thereto, said second outer plate being adapted to be connected to said second planar member; and
   pivot means for pivotally connecting said first and second outer plates and said middle plate along juxtaposed longitudinal edges wherein said first and second outer plates are situated in a common plane that is perpendicular to the plane of said middle plate when said first and second planar members connected thereby are in perpendicular planes, said first and second outer plates being in perpendicular planes and said middle plate being in parallel abutment to said second outer plate when said first and second planar members are in a common plane.

2. The apparatus defined by claim 1 wherein said pivot means includes:
a plurality of spaced segments on each of said outer plates and said middle plate, said spaced segments each forming a pivot pin channel and being interspersed along longitudinal edges of the respective plates to form a combined pivot pin channel when said segments are placed in an abutting series relationship; and
   a pivot pin adapted to be housed in said combined pivot pin channel, a line extending through the longitudinal axis of said pivot pin being essentially horizontal.

3. The apparatus defined by claim 1 wherein said first and second outer plates and said middle plate are equipped to each have a plurality of apertures extending therethrough for enabling said plates to be fastened to said first and second planar members to be pivotally connected.

4. The apparatus defined by claim 1 wherein said first and second outer plates and said middle plate are elongate planar members, said first and second outer plates and said middle plate being pivoted along juxtaposed longitudinal edges.

5. The apparatus defined by claim 1 wherein said first and second outer plates and said middle plate are elongate planar members of uniform length.

6. The apparatus defined by claim 5 wherein said pivot means includes:
a plurality of spaced segments on each of said outer plates and said middle plate, said spaced segments each forming a pivot pin channel and being interspersed along longitudinal edges of the respective plates to form a combined pivot pin channel when said segments are placed in an abutting series relationship; and
   a pivot pin adapted to be housed in said combined pivot pin channel, a line extending through the longitudinal axis of said pivot pin being essentially horizontal.

7. The apparatus defined by claim 6 wherein said first and second planar members are massive planar elements, each having edges and two major planar surfaces, said first planar member to be pivoted about a horizontal pivot axis, said second outer plate adapted to be fastened to an edge of said second planar member, said first outer plate adapted to be fastened to a first major planar surface of said first planar member, said middle plate adapted to be fastened to an edge of said first planar member, said flange adapted to be
5 fastened to a second major planar surface of said first planar member, whereby said first planar member is adapted to be pivoted about said horizontal pivot axis when connected to said second planar member by said hinge.

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