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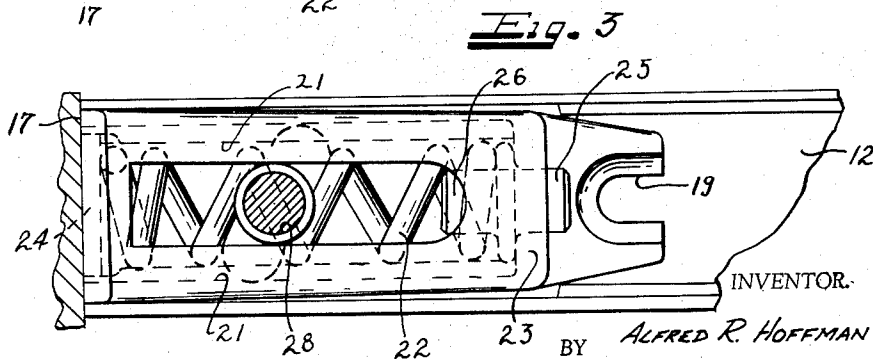
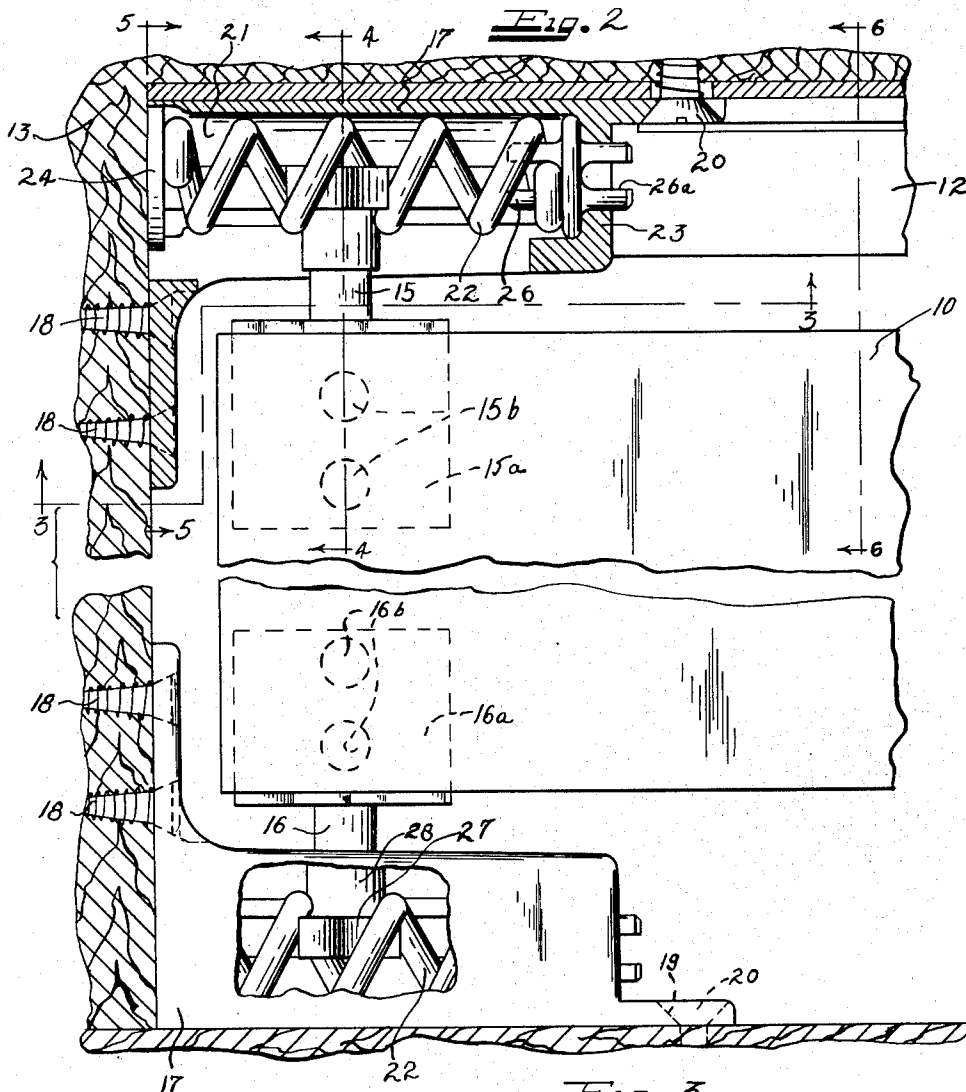
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ADJUSTABLE DOOR HINGE ASSEMBLIES

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2 Sheets-Sheet 2



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ADJUSTABLE DOOR HINGE ASSEMBLIES

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This invention relates to a hinge assembly wherein the pivot member has its turning axis established on a support member by interconnecting means, including a screw, operable to shift the pivot member relative to the support member between selected positions along a fixed line of travel in radially extending relation to the turning axis.

A hinge assembly incorporating features of this invention is especially useful in door installations since it permits the shifting of the turning axis as needed to maintain proper registry between the edges of the door and the frame of the doorway or boundaries of the closure area in reference to which the door swings between closed and open positions.

An important object of this invention is to provide a hinge assembly of the character indicated which may be conveniently installed and which is simple and efficient in use whereby accurate registration of the door edges and the boundaries of the doorway with which the door is operatively associated may be readily maintained.

Further objects of the invention are in part obvious and in part will appear more in detail hereinafter.

The invention will be readily understood from the following description thereof, taken in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary side view of a door installation, with parts removed showing an upper and lower hinge assembly applied thereto in accordance with the present invention.

FIG. 2 is a foreshortened enlarged elevation of the door mounting shown in FIG. 1, wherein one type of the upper and lower hinge mountings of this invention are shown in section.

FIG. 3 is a plan view, with parts removed, taken upwardly along line 3-3 of FIG. 2.

FIG. 4 is a vertical sectional view taken along line 4-4 of FIG. 2.

FIG. 5 is a rear elevation of the upper hinge mounting shown in FIG. 2.

FIG. 6 is a front elevation of the upper hinge mounting shown in FIG. 2.

FIG. 7 is a fragmentary perspective view of details of construction of an inner portion of the housing shown in the hinge mounting illustrated in FIGS. 2 to 6 inclusive.

FIG. 8 is a front elevation of adjusting means used in the hinge mounting shown in FIGS. 2 to 6 inclusive.

A hinge assembly representing one embodiment of this invention is shown in FIG. 1 to FIG. 8 inclusive of the drawing as applied to a door installation including a pair of door units 10 and 11 and a doorway having a jamb 13 along one side thereof and an overhead track 12 along the upper limits of the doorway. Door unit 11 is provided with suitable swivel supporting and guiding means 11a slidable on the track 12 and door units 10 and 11 are joined by hinges 14 along adjoining edges thereof. Door unit 10 is supported for swinging movement between folded and extended positions about an axis defined by a top hinge assembly having a pivot pin 15 and a bottom hinge assembly having a pivot pin 16. The units 10 and 11 are collectively swingable from a folded or collapsed state to open the area of the doorway to an extended state to close the area of the doorway. A line designated in FIG. 1 as A-A represents a stop surface such as the leading edge of a second door unit

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in said doorway or the jamb of the doorway opposite the jamb 13 with which the leading edge of the door unit 11 is adapted to register when the units 10 and 11 are in fully extended position.

A bracket 17 secured by screws 18 at one end thereof to the jamb 13 occupies a position within the channel defined by the track 12. The opposite end of the bracket is provided with a notch 19 for receiving a screw 20 which passes through a slot or opening in the base of the track opposite thereto to rigidly join the bracket 17 to the upper frame work of the doorway. It will be noted that the bracket is provided with spaced parallel walls 21 extending lengthwise of the track. The area between walls 21 is occupied by a spirally coiled metal strip or rod defining a screw 22, with the longitudinal axis of the screw 22 parallel to said walls.

An end wall 23 spans the distance between walls 21 against the inner surface of which the screw 22 bears to limit movement of the latter toward the end of the bracket facing in a direction away from the jamb 13. The opposite end of the area between said walls 21 is open to provide an entrance through which the screw 22 is initially positioned between said walls. After the screw 22 is thus operatively located between said walls, the entrance is closed by a retainer 24 suitably fastened to the edge of the opening defining said entrance and the screw 22 bears against the inner surface of said retainer 24 to limit movement of the screw 22 in the direction of the end of the bracket facing the jamb 13. While thus trapped against relative movement in opposite directions axially of the screw, the screw is allowed to be rotated about its own axis under force of a turning key 25. The key 25 extends inwardly of the area of the bracket containing the screw 22 via an opening in the end wall 23 in which the key is journaled for rotation about an axis extending centrally and longitudinally of the walls 21. The screw 22 is coupled to a forked shank 26 at the inwardly projecting end of the key 25 whereby the screw 22 rotates in unison with turning of the key 25 in either direction. The end of the key 25 extending outwardly from the end wall 23 is slotted as at 26a for cooperation with the blade of a screw driver or the like to effect rotation of the screw 22 as desired. A block of molded plastic material having a base portion 27 is slidably trapped between adjoining coils of the screw 22 so as to be moved axially of the screw in response to rotation of the screw. A head portion forming an extension of said base portion in a direction radially of the axis of rotation of the screw 22 is provided with a cylindrical cavity 28 of such diameter as to define a bearing in which the pivot pin 15 is receivable for relative turning movement therein. A groove 29 provided along inner surfaces of the bracket receives base portion 27 of the pivot block whereby the pivot block has guided movement fore and aft of a line coincident with the axis of rotation of the screw via said interengaged relation with the groove 29 in the side walls 21 of the bracket while also trapped thereby against withdrawal from operatively engaged position between the coils of said screw. The interengagement thus provided between the screw 22 and the trapped pivot block as well as the connection between the screw 22 and the turning key 25 combine to hold the screw 22 in fixed coaxial relation to the axis of the turning key 25 while the screw 22 is operative to drive the pivot block between selected adjusted positions. The turning axis of the door unit 10 as thus established by the pivot pin 15 and the cavity or bearing 28 on pivot block, is adjustable along a line of travel extending radially of said axis to occupy selected positions along said line of travel under control of linear driving forces applied to the base portion 27 of the pivot block by the coils of the screw 22 as the latter is rotated

by a suitable tool, such for example as a screw driver, engaging the slotted head of the key 25. The turning key 25 is provided with a radially extending annular flange 25a having slidable engagement with the inwardly facing surface of the end wall 23 whereby the key 25 is trapped against unintentional withdrawal from the opening in which the key 25 has rotatable bearing support. Interfacing surfaces of the flange 25a and the end wall 23 are preferably provided with interfitting radial corrugations 23a which serve to yieldably resist rotation of the key 25 and screw 22 from a selected rotated position thereby preventing unintentional deviation from a selected adjusted position of the pivot block under stress applied against the key 25 from the opposite direction by the screw 22.

An adjustable turning axis for the door 10 is also provided in connection with the lower pivot pin 16, as shown in FIG. 1, by means of a hinge assembly corresponding to the hinge assembly hereinbefore described with reference to upper pivot pin 15. As will be noted, a bracket 17 secured by screws 18 at one end to the jamb 13 and secured to the floor of the doorway by a screw 20 in notch 19, supports a rotatable screw 22 with which a pivot block 27 has driving engagement. The pivot block 27 has interengagement with lower pivot pin 16 via an upwardly open cavity 28 in the same manner that the upper pivot pin 15 and the pivot block 27 associated therewith establish a turning axis for pivot pin 15. Accordingly, the turning axis of the door 10 via lower pivot pin 16 is adjustable to selected positions along a path extending radially of said axis in the same manner that the turning axis of the upper pivot pin 15 may be varied through rotation of the adjustment screw 22.

The pivot blocks 27 are preferably molded of synthetic resinous material having self lubricating character in order to assure friction free as well as noiseless bearing engagement with the pivot pins 15 and 16 cooperating herewith.

What is claimed is:

1. A hinge assembly having a pivot pin and mounting means with which said pivot pin cooperates to establish

the turning axis of said pin, said mounting means including a support member having a pair of spaced parallel side walls, a helically coiled metal strip defining a screw of uniform diameter throughout its axial dimension and having surfaces thereof parallel to its axis in confining abutment with oppositely facing internal surfaces of said side walls, stop means facing opposite axial ends of said screw obstructing movement of said screw in opposite axial directions, said stop means including an end wall joining said side walls of the support member, a key member having journal support in said end wall for rotation about a fixed axis centrally of said side walls of the support and having engagement with said screw to effect rotation thereof about its axis in response to rotation of said key, a bearing member straddled by a pair of adjoining convolutions of said screw, interfitting means on said bearing member and said side walls of the bracket operative to prevent movement of said bearing member relative to said side walls in directions radially of the axis of said screw while permitting said bearing member to travel fore and aft of the axis of said screw in response to rotation of said screw, and a cavity in said bearing member in which said pin is receivable for relative turning movement therein.

2. A hinge assembly according to claim 1 wherein said key member has an annular flange opposite the surface of said end wall facing the screw, and said flange and said surface of said end wall have intermeshing projectings and depressions operable to releasably retain said key and said screw in selected rotated positions and thereby establish the bearing member in fixed selected positions fore and aft of the axis of the screw.

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