June 28, 1938. P. ETZEL 2,121,790

HINGE MOUNTING FOR DOORS AND THE LIKE

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Fig. 2.

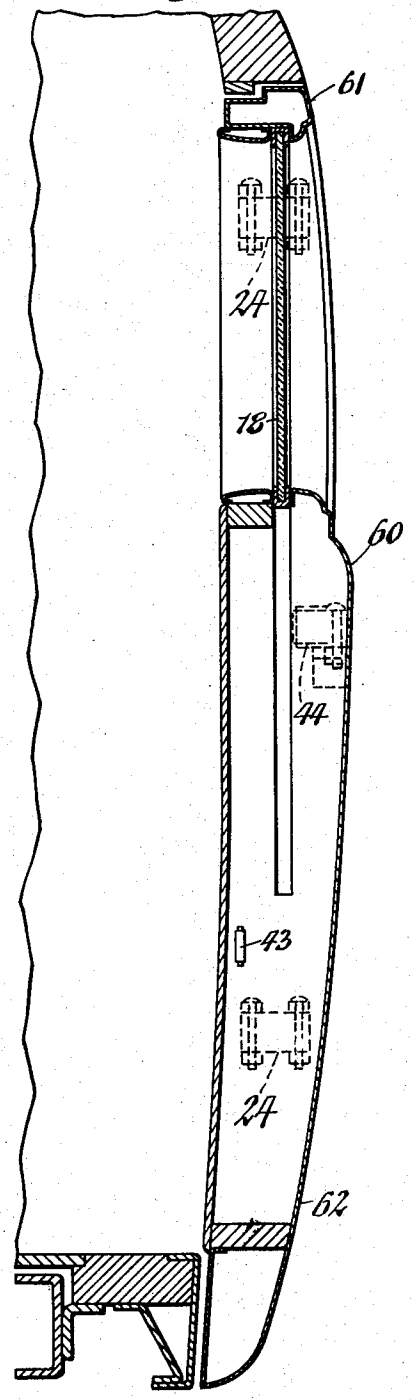
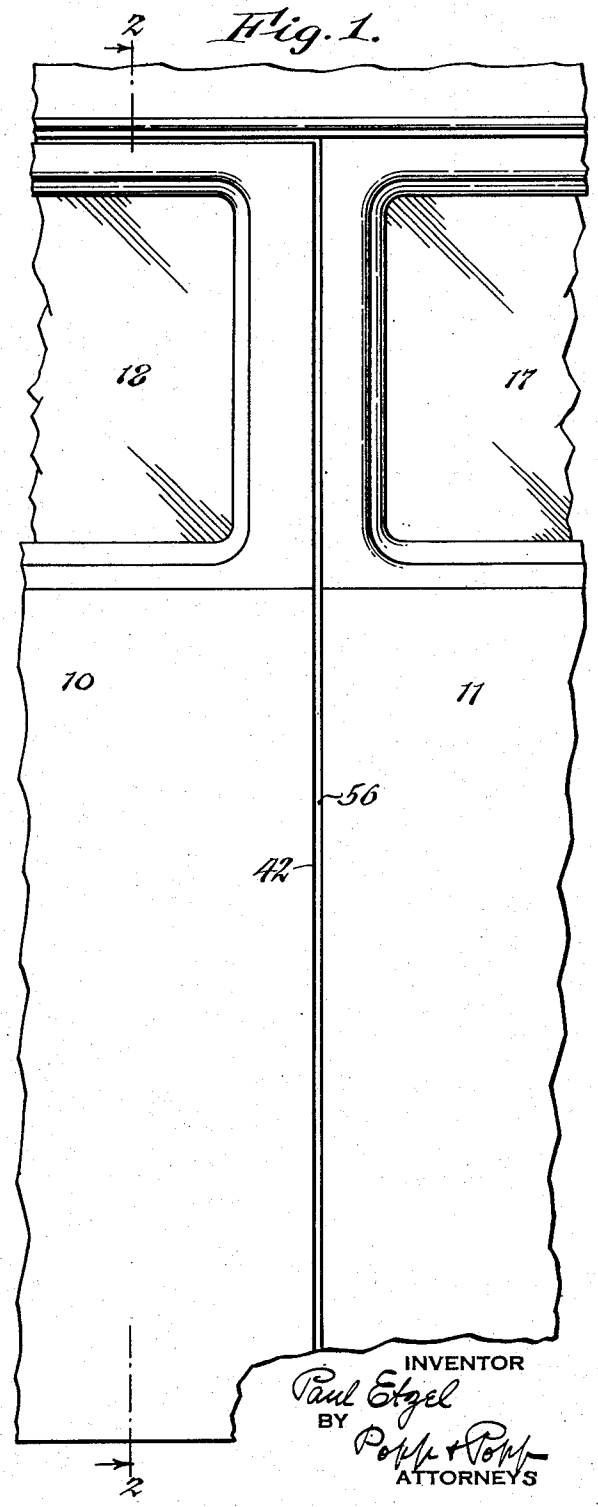


Fig. 1.

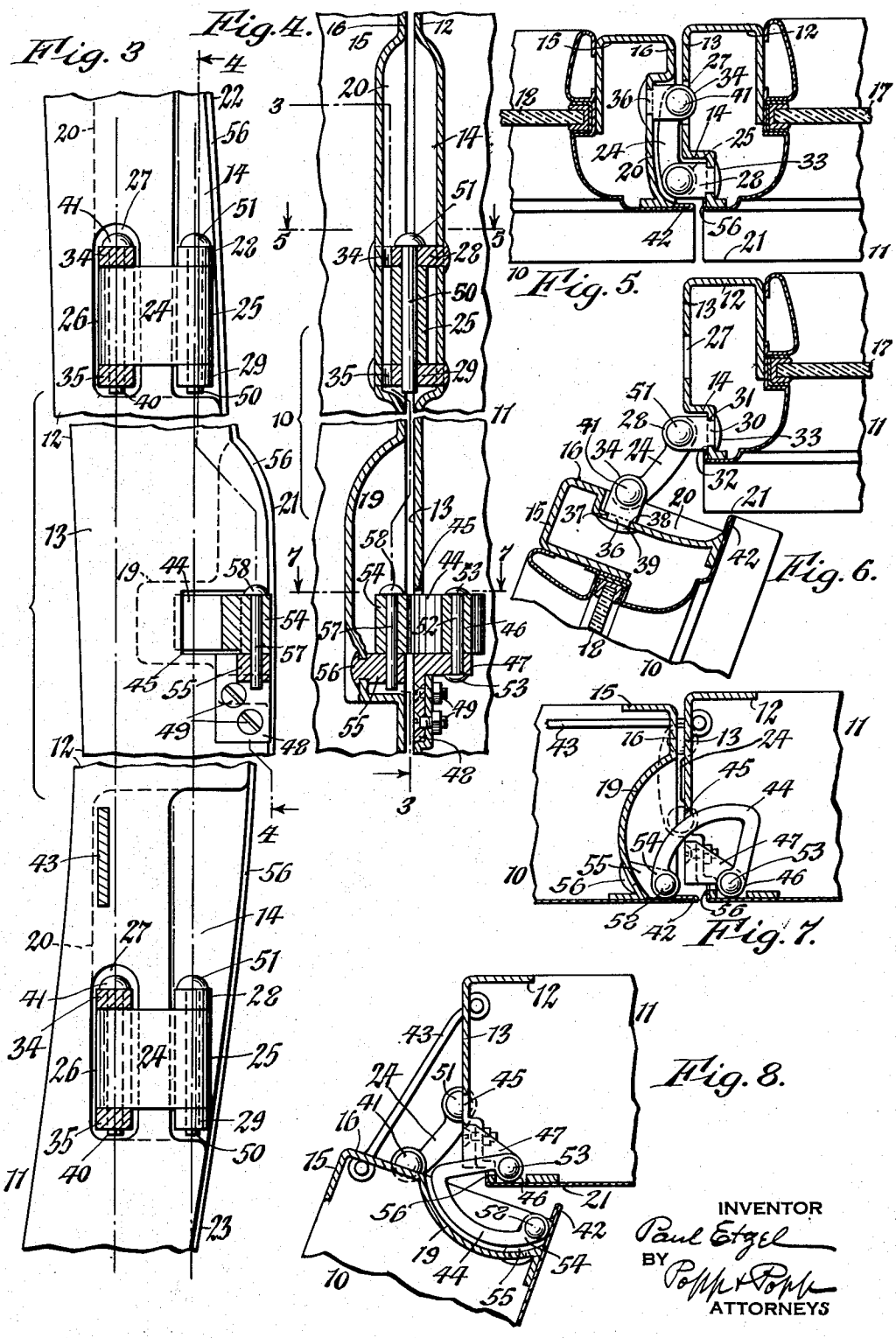


INVENTOR
Paul Etzel
BY
Popp & Popp
ATTORNEYS

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Patented June 28, 1938 2,121,790

UNITED STATES PATENT OFFICE

2,121,790

HINGE MOUNTING FOR DOORS AND THE LIKE

Paul Etzel, Buffalo, N. Y.

Application February 12, 1937, Serial No. 125,467

8 Claims. (Cl. 16—164)

This invention relates to a hinge mounting which may be employed for various installations in which it is necessary or desirable to movably mount a door or similar member on a body or the like so that when the door is closed a comparatively close fit will be produced between the door and body but which will permit the door, upon being opened, to move a considerable distance away from the outer side of the body and thus not only clear any laterally projecting swell, bulge or ornamentation on the body but also avoid the possibility of marring the finish or surface on the respective parts of the door and body.

The objects of this invention are to provide a hinge mounting of this character which not only possesses the above-mentioned advantages but which also is so constructed that the same is completely concealed within the door and body when the door is closed, and which is also composed of simple parts capable of being produced at low cost and easily and quickly assembled and dismembered and which requires removal of less stock from the door and body pillars to accommodate the hinge mounting than has been necessary for this purpose heretofore.

In the accompanying drawings:

Fig. 1 is a fragmentary side elevation of a door and the adjacent wall portion of the body of an automobile equipped with my improved hinge mounting for movably connecting the door and the body.

Fig. 2 is a fragmentary vertical section taken on line 2—2, Fig. 1.

Fig. 3 is a fragmentary vertical transverse section, on an enlarged scale, taken on line 3—3, Fig. 4.

Fig. 4 is a vertical longitudinal section taken on line 4—4, Fig. 3.

Fig. 5 is a horizontal section taken on the correspondingly numbered line in Fig. 4 and showing the door of the automobile closed.

Fig. 6 is a view similar to Fig. 5 but showing the door open.

Fig. 7 is a horizontal section taken on line 7—7, Fig. 4, with the door in its closed position.

Fig. 8 is a view similar to Fig. 7 but showing the door open.

In the following description similar characters of reference indicate like parts in the several figures of the drawings.

Although this hinge mounting may be used for various purposes the same is shown in the present case in connection with an automobile for movably connecting one of its horizontally swinging doors 10 with the adjacent wall part 11 of the stationary body. In the present case the door and body of the automobile are constructed principally of sheet metal but this invention is also applicable to automobiles and other structures in which the members which are more particularly associated with the hinge mounting are made of wood or other suitable material.

As shown in the drawings the body or side wall portion of the automobile is provided with an upright pillar 12 which is constructed of sheet metal and provided with a vertical transverse hinge face 13 and pockets 14 at the outer corner of this face. The door is provided with an upright pillar 15 of sheet metal having a transverse hinge face 16 which opposes the hinge face 13 of the body pillar. The body and door may be provided with the usual windows 17, 18 which, however, form no part of the present invention.

About midway of the hinge face of the door pillar the same is provided with an intermediate recess or pocket 19 which extends inwardly from the outer corner of this pillar and terminates a short distance from the inner corner thereof, as shown in Figs. 7 and 8, and on the upper and lower ends of the hinge face of this pillar the same is provided with recesses 20, 20 which extend inwardly from the outer corner of this pillar and terminates a short distance from the inner corner thereof, as best shown in Figs. 5 and 6. These several recesses are preferably formed by pressing the respective parts of the metal of the pillars backwardly relative to the hinge faces thereof.

The hinge mounting embodying my invention includes load carrying means which movably connect the door pillar with the body pillar and serve primarily to carry the weight of the door and controlling means which operatively connect the door and body pillars and serve primarily to control the movement of the door so that its pillar will produce a comparatively close joint with the body pillar in the closed position of the door but will cause the door upon being opened to move clear of the laterally projecting swell, bulge or ornamentation on the outer side of the automobile body.

It is well known that automobiles as now commonly constructed have the sides of their bodies swelling or bulging outwardly about midway of their height a considerable distance beyond the receding upper and lower parts of the upright body portions of the respective wall, this salient portion of the body being indicated at 21 and the upper and lower receding portions of the same being indicated at 22 and 23 in Fig. 3.

In the case of an automobile body having the swell formation above-mentioned it is to be understood that the door is of corresponding shape as clearly appears in Fig. 2 in which the salient part 60 of the door is arranged between the upper and lower receding parts 61, 62 of the same.

In the case of an automobile door it is preferable to employ two units of like construction which together operate as the load supporting means of the hinge mounting which units connect the upper and lower parts of the body and door pillars and only one motion controlling unit which connects the central parts of these pillars for causing the door to swing in the desired path upon opening and closing the same in accordance with my invention. The number of load supporting units and movement controlling units which are employed in any particular installation may, however, be varied to suit different conditions or requirements.

Inasmuch as the two load supporting units of the hinge mounting shown in the drawings are identical in construction and operation the following description of one of these units will apply to both of them:—

The numeral 24 represents a horizontally swinging load supporting link which is normally arranged with its central part mainly in a transverse position within one of the pockets 20 of the door pillar when the door is in its closed position while the hinge eye 25 at the outer end of this link projects into the respective pocket 14 and the inner hinge eye 26 of this link projects through an opening 27 in the hinge face of the body pillar, as shown in Fig. 5. The upper and lower ends of the outer eye 25 of the load supporting hinge link 24 are engaged by hinge blocks 28, 29 which are arranged in the adjacent pocket 14 of the body pillar, each of these blocks being secured to the transverse face of this pocket, preferably by forming a reduced neck 30 on each respective hinge block and securing the same in an opening 31 in the adjacent part of the body pillar by engaging the shoulder 32 on the outer end of this neck with the outer side of the body pillar and engaging an upset or riveted head 33 on the inner end of this neck with the inner side of this body pillar, as shown in Figs. 5 and 6, with reference to the block 28, it being understood that the block 29 is similarly mounted.

The outer eye 25 of the hinge link 24 and the upper and lower hinge blocks 28 and 29 are pivotally connected with each other by means of an upright hinge pin or pintle 50 passing through these members which pintle is preferably inserted from the top and provided with a head 51 which is adapted to rest upon the upper hinge block 28 and thereby limit the downward movement of the respective hinge pin, as best shown in Fig. 4.

On its upper and lower sides the inner hinge eye 26 is engaged by upper and lower hinge blocks 34, 35 which are arranged in the inner parts of the respective recess or pocket 20 of the door pillar and project through the opening 27 in the body pillar, as shown in Figs. 5 and 6. Each of these last mentioned inner hinge blocks 34, 35 is secured to the adjacent transverse back or bottom part of the pocket 20 by means of a reduced neck 36 on each block projecting through an opening 37 in the bottom of the recess 20 and secured therein by means of a shoulder 38 formed on this block at the inner end of the neck 36 and bearing against the outer side of the door pillar and a head 39 upset or riveted on the inner end of the neck 36 and bearing against the inner side of the door pillar, as shown in Figs. 5 and 6, with reference to the block 34, it being understood that the block 35 is similarly mounted. The inner eye 26 of the load supporting link 24 and the upper and lower inner hinge blocks 34, 35 are pivotally connected by an upright pin or pintle 40 which passes vertically through this eye and said hinge blocks. This last mentioned pintle is preferably passed through these parts from the top and provided with a head 41 which engages the upper, inner hinge block 34 for the purpose of limiting the downward movement of this pintle, as indicated in Fig. 3.

In the closed position of the door the hinge face of its pillar is arranged transversely of the body and opposes the hinge face of the body pillar, and the central part of the link 24 is arranged principally in the recess or pocket 20 of the door pillar while the inner eye 26 of the load supporting hinge link projects into the opening 27 together with the respective hinge blocks 34, 35, as shown in Fig. 5.

Upon swinging the door horizontally outward into an open position the load supporting hinge link 24 assumes an outwardly inclined position relative to the body and door pillars whereby the outer corner of the door pillar is carried a considerable distance beyond the outer side of the body pillar which latter at this time is overhung or overlapped by the outer corner of the door pillar.

In order to cover the gap between the door and body pillars in the closed position of the door and render the joint between the same practically weather tight a weather flange or strip 42 is arranged vertically on the outer corner of the door pillar and projects toward the body pillar so that in the closed position of the door this weather flange 42 overlaps or overhangs the pockets 14 of the body pillar and prevents the passage of wind and rain through the joint between the pillars as well as producing a finished appearance of this part of the body of the automobile. The outward movement of the links 24 of the load supporting hinge units is limited so that upon swinging the door into its fully open position the edge of the weather flange or strip 42, although overhanging the adjacent salient part 21 of the automobile body will not come in contact with the same, as shown in Fig. 6 thereby avoiding marring of the cooperating surfaces.

For the purpose of thus limiting the opening movement of the door any suitable stop mechanism may be provided such, for example, as the door stop strap 43 extending across the joint or gap between the door and body pillars 15, 12 and having its opposite ends connected with these pillars in the manner shown in Fig. 8 which is now in common use.

Inasmuch as the position of the door relative to its supporting links 24 would be indefinite unless some means are provided to direct this movement one or more controlling hinge units are employed which compel the door to assume a definite position with reference to the supporting links upon opening and closing the same. In the present case a single controlling unit is employed for accomplishing this purpose which unit is interposed between the hinge faces of the door and body pillars about midway of the

height thereof and in its preferred form is constructed as follows:—

The numeral 44 represents an elbow shaped controlling link one part of which is arranged within the pocket 19 of the door pillar and another part of which is arranged within the adjacent portion of the body pillar, the latter being provided with an opening 45 through which this link moves horizontally upon opening and closing the door.

At its inner or rear end this controlling link is provided with an eye 46 which rests upon a hinge block 47 formed on a bracket 48 secured to the outer part of the hinge face of the body pillar by means of bolts 49, as shown in Figs. 3, 4, 7 and 8.

The inner or rear eye 46 of the controlling link is pivotally connected with the hinge block 47 by means of a vertical pivot pin or pintle 52 passing vertically through the eye 46 and block 47 and provided with riveted heads 53 at its upper and lower ends which engage with the upper side of the eye 46 and the lower side of the block 47, respectively, for holding this pintle against vertical movement.

The outer or front end of the controlling link 44 is provided with an eye 54 which rests on the upper side of a hinge block 55 which is secured to the lower part of the back wall of the pocket 19 by means of a rivet 56 formed integrally with this last mentioned hinge block, as shown in Fig. 4, similar to the manner of securing the hinge blocks 28, 29, 34 and 35 to the body and door pillars or by any other suitable means. The controlling link is pivotally connected with the hinge block 55 by means of an upright pintle or pivot pin 57 passing vertically through the hinge eye 54 and hinge block 55 and provided at its upper end with a head 58 which engages with the upper side of the hinge eye 54 for limiting the downward movement of this pivot pin or pintle.

In the closed position of the door the axes of the pivotal connections between the opposite ends of each supporting link 24 and the body and door pillars are arranged in a plane which extends transversely of the body and door of the automobile and the axes of the pivotal connections between opposite ends of the controlling link with the adjacent parts of the body and door pillars are arranged in a plane which extends lengthwise of said body and door and is located outside of the load supporting links and close to the outer side of the door and body, as shown in Figs. 5 and 7. At this time the larger part of the elbow shaped controlling link is also located within the body pillar and only a small part thereof is arranged within the pocket 19 of the door pillar, as shown in Fig. 7.

Upon opening the door the controlling link moves outwardly from the body pillar and into the door pillar so that at the end of this opening movement the larger part of this link is arranged within the pocket 19 of the door pillar and the smaller part thereof is arranged within the body pillar, as shown in Fig. 8.

Inasmuch as the fixed pintles 50 of the load supporting hinge units and the fixed pintle 52 of the controlling hinge unit are arranged out of line or eccentric relative to one another and both the load supporting links and the controlling link swing horizontally in two different arcs upon opening and closing the door the position of the door relative to the body of the car is always a resultant of the two arcs which are traversed by the supporting and controlling links. This resultant is so determined that when the door is in its open position the weather flange 42 on the outer corner of the door pillar will be carried across the outer side of the door pillar a sufficient extent to open the door as far as is required to permit easy entrance and exit through the doorway. This opening movement of the door is, however, limited by the stop strap 43 as hereinbefore described for the purpose of preventing the weather flange 42 on the outer corner of the door pillar from engaging the adjacent part of the body pillar and the trimming associated therewith and thus avoid injuring or marring these surfaces.

The outer corner of the body pillar is preferably provided with a rabbet 56 which receives the weather flange 42 of the door in the closed position of the latter, as shown in Figs. 5 and 7.

In the construction shown in the drawings one arm of the elbow shaped controlling link is straight and the other is curved but the particular shape of this link may be varied if desired to suit different installations. The radial length of each load supporting link between the axes of the pivotal connections of the same with the body and door pillars is somewhat greater than the radial length between the axes of the pivot pins whereby the controlling link is pivotally connected with the body and door pillars but the relative length of these radii may be varied as required to meet varying conditions.

As clearly shown in Figs. 3 and 4 the pockets 14, 20 and 19 which receive parts of the load supporting links and the controlling link are extended upwardly above the respective hinges a sufficient distance to permit of applying the pivot pins 40 and 50 from the top of the hinge blocks 28 and 34 and also applying the pivot pin 57 from the top of the eye 54 of the controlling link when assembling the load supporting and controlling hinge units and also permitting the withdrawal of the respective pivot pins when it is desired to dismember these hinge units when necessary for making repairs or for other purposes.

The construction of this hinge mounting is such that the same requires less material compared with other hinge mountings for a similar purpose and a minimum amount of work is required on the body and door pillars for installing these hinge units thereon and these units are not only strong and durable and capable of being produced at low cost but they can also be assembled and dismembered more rapidly than has been possible heretofore.

I claim as my invention:—

1. A hinge mounting for movably connecting a door with a body including a supporting link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane transversely of said door and body, and a controlling link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane lengthwise of said door and body.

2. A hinge mounting for movably connecting a door with a body including a supporting link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane transversely of said door and body, and a controlling link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane lengthwise of said door and body, said supporting link being comparatively

straight and said controlling link being of elbow form.

3. A hinge mounting for movably connecting a door with a body including a supporting link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane transversely of said door and body, and a controlling link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane lengthwise of said door and body, said supporting link being comparatively straight and said controlling link being of elbow form and the axes of said pivots being parallel.

4. A hinge mounting for movably connecting a door with a body including a supporting link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane transversely of said door and body, and a controlling link having its opposite ends connected with the body and door by pivots which have their respective axes arranged in a plane lengthwise of said door and body, said supporting link being comparatively straight and said controlling link being of elbow form and the axes of the pivots of said controlling link being parallel with but out of line with the axes of the pivots of said supporting link.

5. A hinge mounting for movably connecting a door with a body including a supporting link normally arranged transversely of said door and body and between the opposing transverse hinge faces of said door and body and having its inner and outer ends pivotally connected with the body and door, respectively, by inner and outer pivots, and a controlling link of elbow form normally extending across the gap between the hinge faces of said door and body and having its opposite ends pivotally connected, respectively, by pivots which are normally arranged in a plane located outside of said supporting link pivots and extending lengthwise of the door and body.

6. A hinge mounting for movably connecting a door having a pillar with a body having a pillar, including a supporting link normally arranged transversely of said door and body and between the opposing hinge faces of said pillars, outer and inner supporting hinge blocks arranged in a plane transverse of the door and body and secured respectively to the outer part of the hinge face of said body pillar and the inner part of the hinge face of said door pillar, outer and inner supporting pintles pivotally connecting the outer and inner ends of said supporting link, respectively, with said outer body and inner door hinge blocks, an elbow shaped controlling link normally extending across the gap between the hinge faces of said door and body pillars, supporting hinge blocks arranged side by side in a plane lengthwise of the body and door and mounted, respectively, on the door and body pillars on a line extending across said gap, and pintles pivotally connecting opposite ends of said controlling link respectively with said supporting hinge blocks.

7. A hinge mounting for movably connecting a door having a pillar with a body having a pillar, including a supporting link normally arranged transversely of said door and body and between the opposing hinge faces of said pillars, outer and inner supporting hinge blocks arranged in a plane transverse of the door and body and secured respectively to the outer part of the hinge face of said body pillar and the inner part of the hinge face of said door pillar, outer and inner supporting pintles pivotally connecting the outer and inner ends of said supporting link, respectively, with said outer body and inner door hinge blocks, an elbow shaped controlling link normally extending across the gap between the hinge faces of said door and body pillars, controlling hinge blocks arranged side by side in a plane lengthwise of the body and door and mounted, respectively, on the door and body pillars on a line extending across said gap, and pintles pivotally connecting opposite ends of said controlling link respectively with said controlling hinge blocks, the hinge face of said door pillar being provided with recesses which are adapted to receive the supporting and controlling links, respectively.

8. A hinge mounting for movably connecting a door having a pillar with a body having a pillar, including a supporting link normally arranged transversely of said door and body and between the opposing hinge faces of said pillars, outer and inner supporting hinge blocks arranged in a plane transverse of the door and body and secured respectively to the outer part of the hinge face of said body pillar and the inner part of the hinge face of said door pillar, outer and inner supporting pintles pivotally connecting the outer and inner ends of said supporting link, respectively, with said outer body and inner door hinge blocks, an elbow shaped controlling link normally extending across the gap between the hinge faces of said door and body pillars, controlling hinge blocks arranged side by side in a plane lengthwise of the body and door and mounted, respectively, on the door and body pillars on a line extending across said gap, and pintles pivotally connecting opposite ends of said controlling link respectively with said controlling hinge blocks, the hinge face of said door pillar being provided with recesses which are adapted to receive the supporting and controlling links, respectively, and said recesses being enlarged beyond said links to provide the requisite space for manipulating the respective pintles when assembling and dismembering the hinge mounting.

PAUL ETZEL.