April 17, 1945. C. E. FULLER 2,373,955

ADJUSTABLE HINGE

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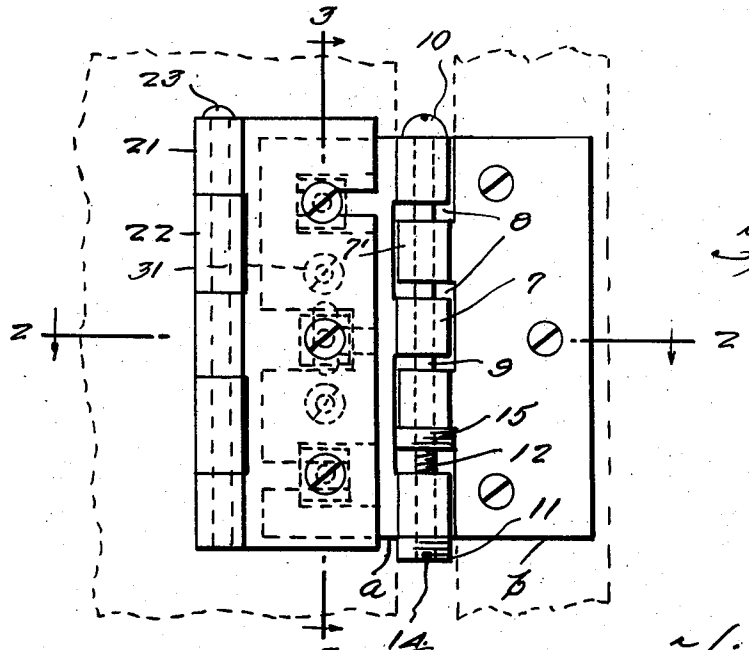


Fig. 1.

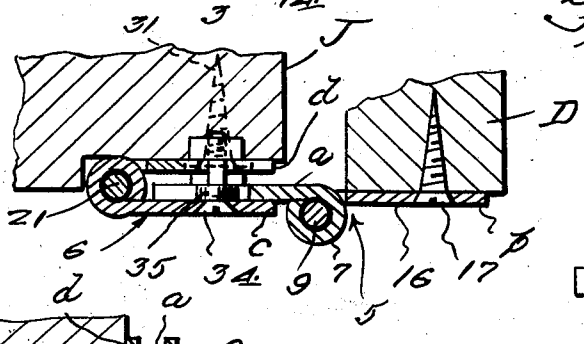


Fig. 2.

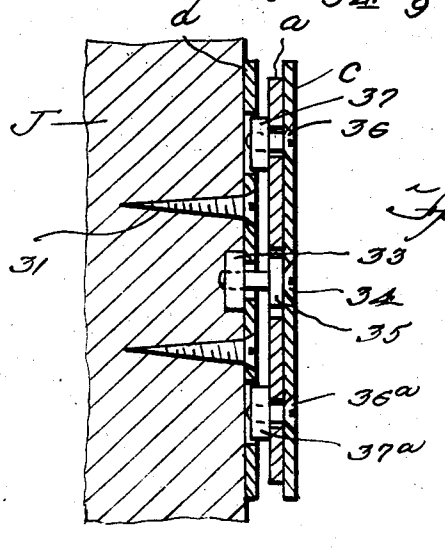


Fig. 3.

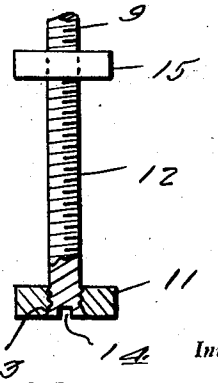


Fig. 4.

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Fig. 5.

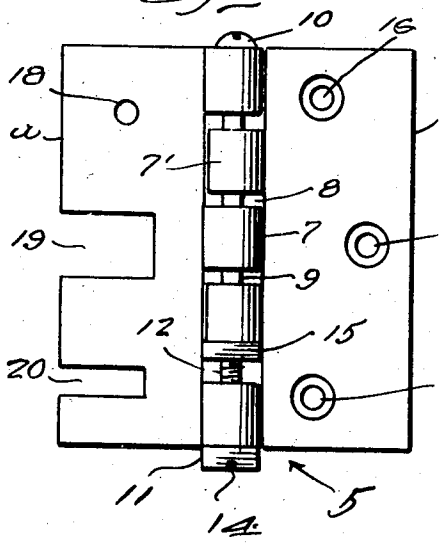


Fig. 6.

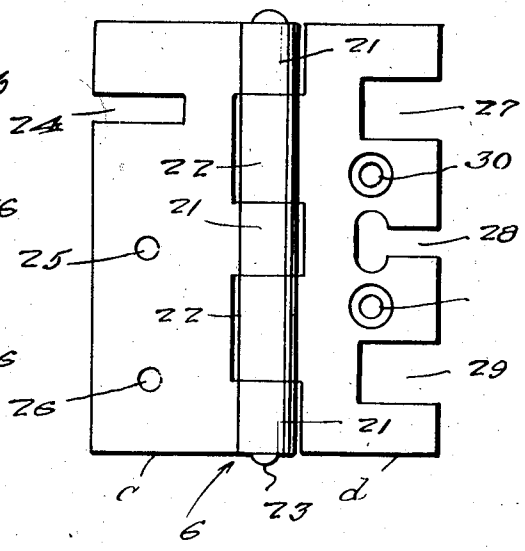


Fig. 10.

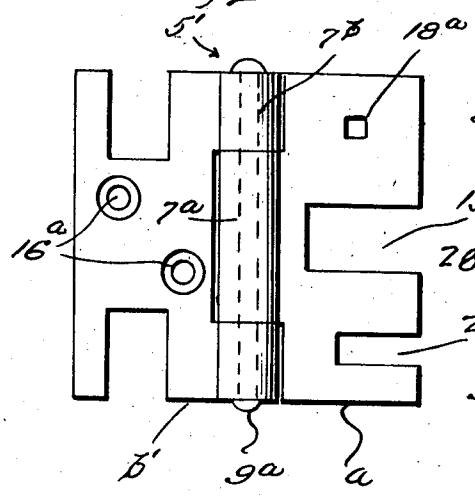
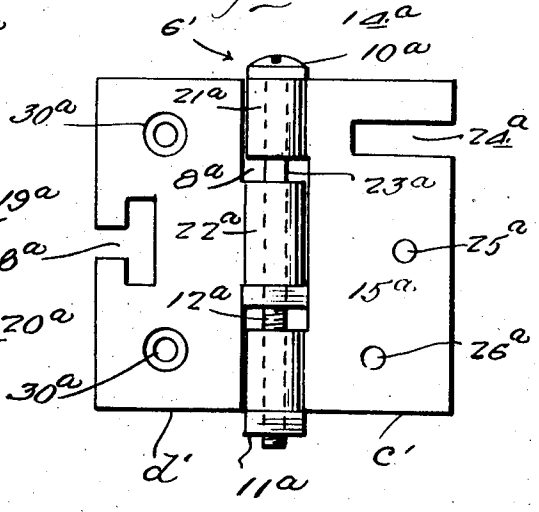


Fig. 11.



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ADJUSTABLE HINGE

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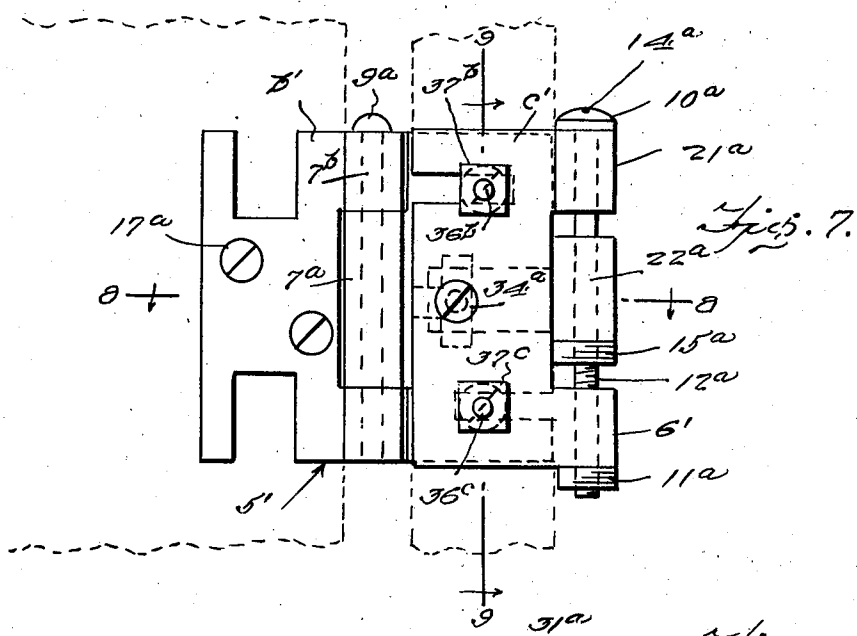


Fig. 7.

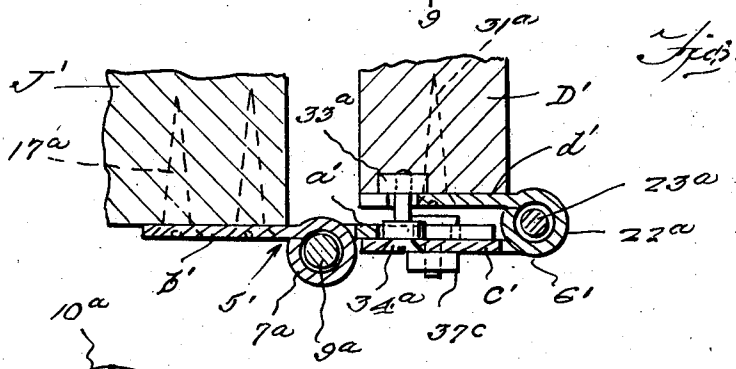


Fig. 8.

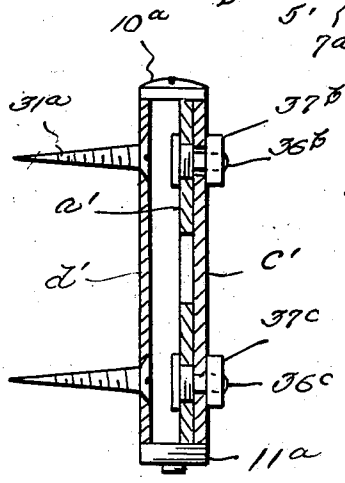


Fig. 9.

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UNITED STATES PATENT OFFICE

2,373,955

ADJUSTABLE HINGE

Charles E. Fuller, Dothan, Ala.

Application January 5, 1944, Serial No. 517,090

6 Claims. (Cl. 16—129)

This invention relates to butt hinges for doors and other horizontally swinging closures, and the primary object of the present invention is to provide a hinge of the above kind that is adjustable so that the door or other closure hung thereby may be caused to operate properly without taking said door or other closure off of the hinge, and regardless of whether the faulty operation of the door is caused by any one of several different reasons.

More specifically, the present invention contemplates the provision of an adjustable butt hinge by means of which the end of a door or other closure hung by the hinge may be adjusted in any one or more of six different directions by merely using a screw driver and/or pliers, and without taking the door off of the hinge. In other words, the hinge provides for adjusting the end of the door mounted thereby, either toward or away from the jamb, inwardly or outwardly with respect to the door opening, or upwardly or downwardly with respect to the latter. In this way, the effects of sagging, warping, swelling, shrinking, or inaccurately installed doors can be overcome so as to cause the door to operate properly.

Briefly stated, the invention embodies a mounting element and a hinge element having one leaf adjustably associated with the mounting element, each element including two leaves or parts, one of which is vertically adjustable relative to the other for effecting upward or downward adjustment of the door or other closure. Means is also provided for adjusting the hinge element relative to the mounting element so as to effect adjustment of the door inwardly or outwardly with respect to the door opening. In addition, means is provided for adjusting the leaves or parts of the mounting element relative to each other so as to effect adjustment of the door or closure to the right or left relative to the door jamb.

A more specific object of the present invention is to provide an adjustable hinge construction of the above kind which is thoroughly practical, simple and durable in construction, inexpensive to manufacture, and easy to install and operate.

Other objects and advantages of the invention will become apparent from the following description when considered in connection with the accompanying drawings, and the invention consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings, wherein like reference characters indicate corresponding parts throughout the several views:

Figure 1 is an elevational view of a hinge constructed in accordance with the present invention, the hinge being shown as it appears when the door or other closure is in fully opened position.

Figure 2 is a horizontal section taken on line 2—2 of Figure 1.

Figure 3 is a vertical section taken on line 3—3 of Figure 1.

Figure 4 is an enlarged fragmentary view, partly broken away and in section, showing a portion of the pintle of the hinge element and the adjusting nut carried thereby.

Figure 5 is an elevational view of the hinge element forming part of the hinge construction shown in Figure 1.

Figure 6 is an elevational view of the mounting element forming part of the hinge construction shown in Figure 1, the adjusting screws being omitted and the leaves of the mounting element being shown unfolded or open.

Figure 7 is a view similar to Figure 1, of a modified form of the invention.

Figure 8 is a horizontal section taken on line 8—8 of Figure 7.

Figure 9 is a vertical section taken on line 9—9 of Figure 7.

Figure 10 is a view similar to Figure 5, of the hinge element forming part of the form of the invention shown in Figure 7.

Figure 11 is a view similar to Figure 6, showing the leaved member forming part of the mounting element of the hinge shown in Figure 7.

Referring in detail to the drawings, and particularly to Figures 1 to 6, inclusive, the hinge shown includes a hinge element 5 and a mounting element 6, the hinge element comprising a pair of leaves *a* and *b* provided with interfitting knuckles 7 and 7' which are spaced apart, as at 8, so as to permit vertical adjustment of the leaf *b* relative to the leaf *a*. Extending through the knuckles 7 and 7' is a suitable pintle 9 having a head 10 on its upper end and a head 11 on its lower end, as well as provided with a threaded lower portion 12. As shown, the upper head 10 may be integral with the pintle, while the head 11 may be in the form of a nut threaded and swaged on the pintle, as at 13, the lower head 11 being provided with a screw driver kerf, as at 14. A nut 15 has adjustable threaded engagement with the threaded portion 12 of the pintle 9, and is dis-

posed in the space between the two lowermost knuckles of the leaves *a* and *b*, the lower knuckle of the leaf *b* resting upon the nut, as shown clearly in Figure 1, and one side of the nut engaging the adjacent edge of the leaf *a* so as to be restrained from rotation by the latter. Obviously, with the leaf *a* mounted on a door jamb J, and a door D hung by the leaf *b*, said door may be vertically adjusted relative to the jamb by rotation of pintle 9. By rotating the pintle in one direction, the nut 15 can be caused to travel upwardly for elevating the leaf *b* and the door carried thereby, whereas rotation of the pintle 9 in the opposite direction will cause lowering of nut 15 so as to allow the leaf *b* and door D to lower.

As shown clearly in Figures 1, 2 and 5, the leaf *b* has several openings 16 for reception of screws 17, whereby the leaf *b* may be secured to the edge of the door. The other leaf *a* is provided at the top with an opening 18 and at its intermediate and lower portions with slots 19 and 20, respectively. The purpose of the opening 18 and the slots 19 and 20 will become apparent presently.

The mounting element 6 comprises a pair of leaves *c* and *d* provided with interfitting knuckles 21 and 22 through which extends a pintle 23 for hinging the leaves *c* and *d* together along corresponding edges. As shown clearly in Figure 6, the leaf *c* is provided at its upper portion with an elongated slot 24 and at its intermediate and lower portions with openings 25 and 26. Also, the leaf *d* is provided at its upper, intermediate and lower portions with slots 27, 28 and 29, respectively. Openings 30 are provided in the leaf *d* between the intermediate slot 28 and the end or upper and lower slots 27 and 29. Installing the mounting element, screws 31 are passed through the openings 30 of leaf *d* and driven into the jamb J so as to firmly fasten the leaf *d* to the jamb within a suitable recess provided in the latter. The leaf *c* is then swung to folded position in spaced parallel relation to the leaf *d*, as shown in Figure 2, it being understood that a nut 33 is first seated snugly within a recess of the jamb J behind the leaf *d*, whereby said nut 33 is prevented from turning. This nut is located so that it is immediately behind and bridges the slot 28 of the leaf *d*. Also, it is well to know at this point that all of the slots so far described are provided transversely of the leaves so as to open through the free vertical edges thereof, as clearly shown in Figures 5 and 6. Swiveled in the opening 25 of leaf *c* is a bolt 34 that extends through slot 28 and has threaded engagement in nut 33. The swivel connection of bolt 34 with leaf *c* includes a collar 35 fixed on the bolt 34 behind the leaf *c* and rotatable in the slot 19 of the leaf *a* of hinge element 5, which leaf *a* is received between the leaves *c* and *d* of the mounting element. It will be apparent that by turning the bolt 34, it may be fed longitudinally so as to swing the leaf *c* toward or away from the leaf *d* so that with the leaf *a* of the hinge element attached to the leaf *c*, the door will be adjusted to the right or left or toward or away from the jamb, considering the door as closed.

For attaching the leaf *a* of the hinge element to the leaf *c* of the mounting element, bolts 36 and 36*a* are provided which extend through the slot 24 of leaf *c* and through the opening 18 of leaf *a*, and through the opening 26 of leaf *c* and the slot 20 of leaf *a*, respectively. Nuts 37 and 37*a* are threaded on the inner ends of the bolts 36 and 36*a* and are received within the slots 27 and 29, respectively, of leaf *d* so that the walls of said slots 27 and 29 restrain the nuts 37 and 37*a* against rotation. Thus, by turning the bolts 36 and 36*a* in one direction, the nuts 37 and 37*a* may be tightened so as to firmly clamp the leaf *a* of the hinge element tightly against the leaf *c* of the mounting element. By turning the screws 36 and 36*a* in the opposite direction, the nuts 37 and 37*a* may be loosened, and due to the slots 24 and 20, the leaf *a* of the hinge element may be adjusted horizontally in a direction inwardly or outwardly of the door opening so as to correspondingly adjust the door. It will of course be understood that the various adjustments can be made at both the top and bottom of the door, the latter being usually hung by similar hinges, one near the top of the door, and one near the bottom thereof. When the desired adjustment has been made, it may be secured by turning the bolts 36 and 36*a* so as to tighten the nuts 37 and 37*a* again. Of course, when the nuts 37 and 37*a* are loosened, the door may be taken off. Also, slots 19 and 28 permit the adjustment of the hinge element relative to the mounting element last described, as well as the removal of the door, by permitting the leaf *a* to move as far as desired relative to the adjusting bolt 34.

From the foregoing description, it will be apparent that I have provided a comparatively simple and durable adjustable hinge construction by means of which adjustment of the door relative to the door jamb may be effected in any one or more of six different directions, thereby effectively taking care of the many different faulty conditions that may occur to cause improper operation of the door.

While the mounting element may be preferably provided on the door jamb, it can be used equally as well upon the door by providing a modified form of hinge construction, as shown in Figures 7 to 11, inclusive. In this embodiment, the hinge element is indicated at 5' and the mounting element at 6', the leaf *a'* being received between the leaves *c'* and *d'* of the mounting element, and the leaf *b'* of the hinge element being secured to the jamb J'. In this case, the leaf *d'* of the mounting element is secured to the edge of the door D', and the knuckles 7*a* and 7*b* of the leaves *a'* and *b'* of the hinge element, respectively, snugly interfit and are connected by an ordinary pintle 9*a*. The leaves *c'* and *d'* of the mounting element, however, loosely interfit so as to leave spaces 8*a* therebetween, and a pintle 23*a* extends through the knuckles 21*a* and 22*a* of the leaves *c'* and *d'*, and has a threaded lower portion 12*a* receiving a nut 15*a* on which the knuckle 22*a* of leaf *d'* rests. Pintle 23*a* has an upper head 10*a* and a lower head 11*a*, the latter being fixed on the pintle and the former having a screw driver kerf 14*a*. Thus, by turning the pintle 23*a*, the nut 15*a* may be vertically adjusted so as to vertically adjust the leaf *d'* relative to the leaf *c'*, such adjustment effecting vertical adjustment of the door D' which is attached to the leaf *d'* by screws 31*a* passing through openings 30*a* in said leaf *d'*. In this arrangement, the mounting element is recessed in the edge of the door, and the leaf *b'* of the hinge element is attached to the jamb J by screws 17*a*. As shown more clearly in Figures 10 and 11, the leaf *a'* of the hinge element has an upper opening 18*a* and intermediate and lower slots 19*a* and 20*a*, while the leaf *d'* of the mounting element has an intermediate slot 28*a*. Also, leaf *c'* of the mounting element 6' has an upper slot 24*a* and intermediate

and lower openings 25a and 26a. A bolt 34a is swiveled in the opening 25a of leaf c' and passes through the slot 19a of leaf a' of the hinge element 5', as well as through the slot 28a of leaf d' of the mounting element 6'. This bolt 34a has threaded engagement in a nut 33a snugly fitted in a recess of the door D' so that the said nut 33a is restrained from turning. By adjusting or turning bolt 34a, the leaf c' may be adjusted toward or away from leaf d', thereby adjusting the door toward or away from the jamb, considering the door closed. Further, bolts 36b and 36c are provided, the former having its head engaged behind the leaf a' of the hinge element and provided with a squared shank portion adjacent its head engaged in the opening 18a. This bolt projects forwardly through the slot 24a and has a nut 37b threaded on the outer end thereof. Similarly, the bolt 36c extends through the slot 20a of leaf a' of the hinge element 5', as well as through opening 26a of leaf c' of the mounting element, the head of bolt 36c being engaged behind the leaf a', and the bolt 36d having a squared shank portion engaging slot 20a to restrain said bolt against rotation. Nut 37c is threaded on the outer end of bolt 36c, and it will thus be seen that nuts 37b and 37c may be loosened by means of a pair of pliers so as to free leaf a' of the hinge element and permit adjustment thereof relative to the mounting element so as to effect adjustment of the door D' inwardly or outwardly with respect to the door opening, as considered with the door closed. When the desired adjustment has been obtained, it may be secured by tightening the nuts 37b and 37c. Thus, the hinge of Figures 7 to 11, inclusive, embody the same adjustments and general construction as that of Figures 1 to 6, inclusive, the primary difference being that the hinge element is attached to the jamb and the mounting element is attached to the door, vertical adjustment of the door being effected by relative adjustment of the leaves of the mounting element instead of by relative adjustment of the leaves of the hinge element.

It will of course be understood that the invention is susceptible to many modifications and various changes in details of construction. It is accordingly noted that various modifications and changes in details of construction may be resorted to without departing from the spirit and scope of the invention as claimed.

What I claim is:

1. An adjustable butt hinge for horizontally swinging closures comprising a hinge element and a mounting element, each having a pair of hingedly connected leaves, means to secure one leaf of one element to the closure, means to secure one leaf of the other element to the jamb of the opening for the closure, the other leaf of the hinge element being received between the leaves of the mounting element and secured to the other leaf of the latter for horizontal adjustment relative thereto and parallel with the plane thereof, and means to secure said other leaf of the hinge element in horizontally adjusted positions relative to said other leaf of the mounting element.

2. An adjustable butt hinge for horizontally swinging closures comprising a hinge element and a mounting element, each having a pair of hingedly connected leaves, means to secure one leaf of one element to the closure, means to secure one leaf of the other element to the jamb of the opening for the closure, the other leaf of the hinge element being received between the leaves of the mounting element and secured to the other leaf of the latter for horizontal adjustment relative thereto and parallel with the plane thereof, and means to secure said other leaf of the hinge element in horizontally adjusted positions relative to said other leaf of the mounting element, said last-named means comprising cooperating openings and horizontally elongated slots in said other leaves, bolts extending through said slots and openings and having nuts threaded thereon, and means to hold the nuts from turning, the slots opening through the outer edges of the leaves to permit complete separation of said leaves upon merely loosening the nuts.

3. An adjustable butt hinge for horizontally swinging closures comprising a hinge element and a mounting element, each having a pair of hingedly connected leaves, means to secure one leaf of one element to the closure, means to secure one leaf of the other element to the jamb of the opening for the closure, the other leaf of the hinge element being received between the leaves of the mounting element and secured to the other leaf of the latter for horizontal adjustment relative thereto, and means to secure said other leaf of the hinge element in horizontally adjusted positions relative to said other leaf of the mounting element, and means connecting the leaves of said mounting element to adjust one toward or away from the other and thereby effect adjustment of an edge of the closure toward or away from its jamb.

4. An adjustable butt hinge for horizontally swinging closures comprising a hinge element and a mounting element, each having a pair of hingedly connected leaves, means to secure one leaf of one element to the closure, means to secure one leaf of the other element to the jamb of the opening for the closure, the other leaf of the hinge element being received between the leaves of the mounting element and secured to the other leaf of the latter for horizontal adjustment relative thereto and parallel with the plane thereof, and means to secure said other leaf of the hinge element in horizontally adjusted positions relative to said other leaf of the mounting element, and means to vertically adjust one leaf of the mounting element relative to the other leaf thereof and thereby adjust the closure up or down.

5. An adjustable butt hinge for horizontally swinging closures comprising a hinge element and a mounting element, each having a pair of hingedly connected leaves, means to secure one leaf of one element to the closure, means to secure one leaf of the other element to the jamb of the opening for the closure, the other leaf of the hinge element being re-received between the leaves of the mounting element and secured to the other leaf of the latter for horizontal adjustment relative thereto, and means to secure said other leaf of the hinge element in horizontally adjusted positions relative to said other leaf of the mounting element, and means connecting the leaves of said mounting element to adjust one toward or away from the other and thereby effect adjustment of an edge of the closure toward or away from its jamb, and means to vertically adjust one leaf of one of the elements relative to the other leaf thereof and thereby adjust the closure up or down.

6. An adjustable butt hinge for horizontally swinging closures comprising a hinge element and a mounting element, each having a pair of hingedly connected leaves, means to secure one

leaf of one element to the closure, means to secure one leaf of the other element to the jamb of the opening for the closure, the other leaf of the hinge element being received between the leaves of the mounting element and secured to the other leaf of the latter for horizontal adjustment relative thereto, and means to secure said other leaf of the hinge element in horizontally adjusted positions relative to said other leaf of the mounting element, and means connecting the leaves of said mounting element to adjust one toward or away from the other and thereby effect adjustment of an edge of the closure toward or away from its jamb, said last-named means comprising a bolt swiveled in a leaf of the mounting element and accessible when the closure is opened, said bolt extending through the mounting element, and a nut having threaded engagement with said bolt and disposed behind the mounting element for non-turning reception within a recess of the associated closure or jamb.

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