TAMPER PROOF DOOR BUTT HINGE ASSEMBLY

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References Cited
UNITED STATES PATENTS
2,719,322 10/1955 Hager et al. ......................... 16/169

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ABSTRACT

This hinge plate assembly is generally of standard construction except that it has been provided with additional formations of the hinge parts and an added hinge pin keeper to prevent the extraction of the hinge pin when the door is closed with its hinged edge in the door jamb. The keeper is formed of flat spring metal and is fixed to the surface of one of the hinge plate and extends laterally through a slot in its bearing portion for engagement with a flattened shouldered recess on the side face of the hinge pin to thereby lock the hinge pin in place against axial displacement from the assembly when the door is closed. In order to keep access to the projection of the keeper when the door is closed and the bearing portions thereof extend into the room space, the keeper is shouldered or widened to overlie the edges of the bearing portion slot into which the keeper extends. Further to prevent access of a tool to the bearing portion to unroll the bearing portion and relieve the keeper projection there is provided a gap-closure on the other of the hinge plates.

8 Claims, 13 Drawing Figures
TAMPER PROOF DOOR BUTT HINGE ASSEMBLY

This invention relates to tamper proof door butt hinge plate assemblies and more particularly to means for fixing or locking the hinge pin into the assembly. It is the principal object of the present invention to provide door butt hinge plate assembly which is tamper proof and which is locked in such a manner when the door is closed that little or no access can be had to the locking keeper projected into a shouldered relief in the hinge pin so as to remove the locking keeper from the pin when the door is in the closed position.

It is another object of the invention to provide a tamper proof door butt hinge assembly which may be used with doors which will have been fitted with double locks for effecting the locking of the door on the inside as well as on the outside for preventing the exit of an intruder into the household or apartment through a window or other than through the main apartment door and so that the door cannot be removed from its hinges any more than it could be opened by engagement of its lock and thereby to keep the intruder confined within the apartment unless he leaves through the unlocked window or entrance from which he had gained admittance.

It is another object to provide a tamper proof door butt hinge assembly in which little alteration needs to be made to the standard hinge plate assembly to render the same lockproof and to thereby keep down the cost of such a tamper proof hinge plate assembly so that the same can be made available at near the expense of a standard hinge plate assembly.

Other objects of the invention are to provide a tamper proof door butt hinge plate assembly having the above objects in mind, which is of simple construction, has a minimum number of parts, inexpensive to manufacture, easy to assemble upon the door, easy to replace its parts and maintain, efficient and effective in use.

For a better understanding of the invention reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of the tamper-proof door hinge as assembled upon the door and door jamb and looking upon the front of the hinge pin keeper fastened to the front of three bearing hinge plate and inserted through a slot in the intermediate bearing and over a flat area of the inserted hinge pin.

FIG. 2 is a full front face view of the open hinge, the door being opened upon the door jamb and looking in plan upon the hinge pin keeper.

FIG. 3 is an elevational view of the hinge removed from the door jamb with the parts folded upon one another and looking in plan upon the rear face of the left two bearing hinge plate, the plate being removed from the door jamb.

FIG. 4 is one end view of the assembled hinge plates as viewed on line 4—4 of FIG. 3.

FIG. 5 is a rear face plan view of both of the hinge parts removed from the door and jamb and looking upon the depressed intermediate gap-closure or tab on the two bearing hinge plate.

FIG. 6 is a transverse sectional view of the hinge as viewed on line 6—6 of FIG. 5.

FIG. 7 is an elevational view with a door closed upon the jamb and the hinge bearing portions of the hinge plate appearing outwardly from the door and jamb into the room space.

FIG. 8 is a transverse sectional view of the closed door upon the jamb and of the hinge plates overlying one another with the hinge bearing portions projecting inwardly into the room space, this view being taken on line 8—8 of FIG. 7 and with illustration being given of how a special tool can be prevented by the door gap closure or tab of the one hinge plate to get at the hinge pin keeper.

FIG. 9 is an enlarged transverse sectional view taken through the hinge, door and jamb and is viewed generally on line 9—9 of FIG. 1.

FIG. 10 is a collective perspective view of the hinge pin that is headed at one end and has a flat keeper slot and the flase bottom head that is assembled upon the bottom bearing of the three bearing plate.

FIG. 11 is an enlarged transverse sectional view taken on line 11—11 of FIG. 10 and cut across the flat keeper slot.

FIG. 12 is a front face plan view of the hinge pin keeper that is inserted through the slotted bearing of the three bearing plate and secured to the front face thereof by a screw extended through the plate and into the wood of the door.

FIG. 13 is a longitudinal sectional view of the keeper viewed on line 13—13 of FIG. 12.

Referring now to the figures, 15 represents generally the tamper-proof door pin hinge embodying the features of the present invention. This hinge 15 comprises generally a door hinge plate 16 that is secured to the inner edge of a door 17 by flat headed wood screws 18 extended through and into countersunk openings in the hinge plate 16 so as to lie flush with the outer surface of the hinge plate 16. This hinge plate is preferably fitted into a depression 19 worked into the inner edge of the door 17 and opening to the inner side thereof. This hinge plate 16 has two vertically spaced hinge pin bearing portions 22 and 23 that are formed by rolling up of projections on the plate so as to provide internal bearing surfaces for a headed hinge pin 24 having a flat top head 25 and serving to couple the hinge plate 16 with a three bearing hinge plate 26 secured in a depression in a door jamb 27 that has but three hinge pin bearing portions 28, 29 and 30 adapted to be matched and placed in vertical alignment with the two hinge pin bearing portions 22 and 23 of the door hinge plate 16 so as to accommodate the hinge pin 24 and join the plates together to form the hinge assembly 15.

Normally when the door 17 is closed to the right as shown in FIG. 1, upon the door jamb 27, the front faces of the hinge plates 16 and 26 overlie one another in substantially flush engagement therewith. The hinge plate 26 is assembled upon the door jamb 17 with flat headed wood screws 31 that penetrate countersunk holes in the plate 26 and enter the wood of the door jamb to hold the hinge plate in assembled relationship thereupon and in a depression 32 formed in the face of the door jamb and opening to edge thereof for this purpose.

As the door is closed, the hinge pin bearing portions of the two hinge plates 16 and 26 are exposed to the room space and if one looked into the room from the outside desired to leave the room, such hinge pins 25 of the hinges are normally readily removable by simply driving them from the bottom upwardly and outwardly of the hinge pin bearing portions of the hinge plates.
Thus, the door with all hinge pins removed could be readily separated from the door jamb or opening free of the lock latch so that one could pass through the door opening. The lower end of the hinge pin 24 is rounded at 33 as can be best seen in FIG. 10 to facilitate the downward insertion of the hinge pin into the hinge plate bearing portions. This rounded end terminates short of the bottom edge of the bearing portion 30 of the hinge plate 16 and in order to give the appearance of a head on the bottom of the pin 24, a flase pin head or cap 34 is frictionally tight-fitted into the open bottom end of the bearing portion 30 and will normally remain in place during the operation of the hinge and until removed as at such time as the hinge pin 24 needs to be removed by the insertion of a driving pin in the bottom of the hinge and lifted from the top bearing portion 28 of the hinge plate 26.

The explanation of the hinge assembly 15 with its hinge parts 16 and 26 and the hinge pin 24 are the common to any standard door hinge assembly. Along with the development of this hinge for a door such that the door can be locked on the inside by a key before passing outwardly through the door and can be locked on the outside after having passed through the door to thereby prevent either entrance or exit of the door without one having a key, such a companion double lock has been developed by the present Applicants and is intended to be covered in a patent application soon to be filed. The object of such a double lock has been to prevent one who has entered an apartment or room through a window from leaving the apartment through its door. In order to provide further safety for the use of such a double lock and to prevent the removal of the door by disassembling its hinges should such an intruder find himself locked within an apartment from such door lock installed upon the apartment entrance and exit door. For this reason, the ordinary door hinge, such as are described up to now, has been improved on by this present invention in order to prevent such intruder from actually removing the door by removal of the hinge pin of the hinges of the door or by easy destruction of the bearing portions of the hinge or to tend into the room space and that are ordinarily accessible even though the hinge plates themselves are confined with their screws between the door edge and the door jamb are inaccessible. The extension of these bearing portions of the hinge plates into the room space when the door is closed can best be viewed from FIGS. 7 and 8. It is thus the intent of the present invention to prevent the removal of the hinge pin 24 from the hinge assembly 15 from inside the door and when the door is closed and locked in the door jamb by means of a pin keeper 36 carried upon the hinge plate 26 and inserted through a slot 37 in the rolled up end of the intermediate bearing portion 29 of the plate 26 into and under a flattened area 38 cut across the hinge pin 24 and located so as to be aligned, when the hinge pin is driven home in the hinge assembly 15, with the slot 37. The pin keeper 36 has an inner tongue projection 39 that is bent downwardly to provide a tab extending from a wide portion 41 of the keeper 36 to conform more to the shape of the inward bend of the bearing portions of the plate as best seen in FIG. 9. The widened portion 41 has its edges overlying the side edges of the tab projection 39 to provide shoulders which will lie against the side end of the slot 37 in the bearing portion 29 in such a manner as to prevent access with a small tool into the ends of the slot 37 and the lifting of the tab 39 from the pin flattened area 38. The slot 37 in the bearing portion 29 may be either a closed transverse slot or can be opened at 42 on the end of the rolled up bearing portion 29, FIG. 9.

In order to hold the keeper 36 in place upon the front face of the hinge plate 26, the keeper is fastened by a screw 43 which has a flat head 44 that will lie flush over the keeper and will be received in a tapered depression 45 on the outer end of the keeper 36 that extends into an enlarged hole 46, FIG. 9, with the screw 43 entering and fixed within the door wood. The keeper 36 lies flush upon the surface of the hinge plate 26 except for the bent down tab 39 which is accommodated within the flattened transverse slot 38 on the hinge pin 24 with the edges of the slot in the hinge pin serving as abutments for the upper and lower edges of the tab projection 39, the lower abutment preventing the lifting of the pin 24. The screw 43, like the screws 31 of the hinge plate 26 are inaccessible so long as the door remains in the door jamb and is closed therein. It can be seen by simply removing the screw 43 that the keeper 36 can be removed and replaced by another. The keeper 36 is preferably made of flat spring material and biased to have tight fitting connections with the slot 37 and with the flattened area 38 of the hinge pin 24.

Referring now particularly to FIGS. 3, 5, 6, 7 and 8, there is shown a gap-closer 51 formed on the hinge plate 16 intermediate its height and depressed into the space between its bearing portions 22 and 23 so as to close a slot which would normally be provided between the exterior surface of the intermediate bearing portion 29 of the three bearing hinge plate 26 so as to prevent the insertion of a prying tool 52 as seen in FIG. 8 into the space and under the edge of the rolled bearing portion 22 of the plate 16 or into the transverse slot 37 in such a manner as to effect a bending outwardly or rolling back of the bearing portion 22 to provide access to the spring tab projection 39 of the keeper 36. The gap-closer or tab projection 51, in order to be depressed as best shown in FIGS. 5 and 6, slightly downwardly and inwardly so that it makes line tangentially to the outer curve surface on the center hinge bearing portion 29 of the plate 26 and close thereto to prevent the insertion of the pointed tool 52 and in order for the same to be freely depressed, relief notches 53 and 54 are cut away and of such small dimension as to allow little clearance for a pointed tool.

It should now be apparent that not only has there been provided the hinge pin keeper 36 to prevent the withdrawal of the hinge pin 24 but also there has been provided by the provision of the gap-closer tab 51 means to prevent easy access to the spring hinge pin keeper 36 and the rolling outwardly of the bearing portion 29 of the plate 26 and into the slot 37. In order to roll back the bearing portion 29 the same could be done only by the insertion of the tool under its rolled up edge or into the slot 37 into which the keeper tab portion 39 extends for engagement with the shoulders provided in the hinge pin. It should also be apparent that the widened portion 41 providing shoulders on the keeper 36 prevents when the door is closed, ready access of a tool into the bearing portion 29 of the plate 26 to the ends of the slot 37, the ends of the slot 37 and the notches 53 and 54 being closed by the shouldered portions 41 particularly when the door is closed and the hinge plates overlie one another.
It should be apparent that there has been provided a door hinge that cannot be easily assembled and taken apart from inside the door when the door has been locked from the inside as well as the outside upon one leaving an apartment and in a manner which can be accomplished with the double door lock covered in our separate patent application. It should be apparent that the present tamper proof door hinge is practical, easy to assemble, and adapted for manufacture. It should also be apparent that with the pin keeper provided by the present invention the hinge pin may be inserted into the hinge assembly upside down and can be headless.

While various changes may be made in the detailed construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. A tamper proof door butt hinge assembly comprising two hinge plates adapted for assembly respectively upon the inner edge of a door and upon the door jamb and to overlie one another with the door being closed upon the jamb, each of said plates having bearing portions adapted when the hinge plates are abutted with one another to be axially aligned with the bearing portions of one plate with the other, a hinge pin axially extendable through the aligned bearing portions to hold the hinge plates in assembled relationship, said hinge pin being relieved to provide locking shoulder means, one of the bearing portions of one of the plates being slotted longitudinally thereof and a hinge pin keeper adapted to be fixed to the hinge plate to overlie the same in a flush manner and having a tab portion extendable through bearing slot and into the shoulder relief in the hinge pin, said keeper being inaccessible upon the door being closed within the door opening or jamb.

2. A tamper proof door butt hinge assembly as defined in claim 1 and said hinge pin keeper being formed of flat metal and having a widened portion providing shoulders outwardly of the ends of the projection of the keeper into the bearing slot and shouldered relief in the hinge pin whereby access to the ends of the keeper slot will be prevented by a pointed tool.

3. A tamper proof door butt hinge assembly as defined in claim 2, and said hinge pin keeper having a depressed countersunk portion for receiving a flat headed screw and said one hinge plate having an oversized hole for receiving the screw and the countersunk portion of the keeper so that the keeper can be locked by the screw with the wood in the edge of the door or jamb.

4. A tamper proof door butt hinge assembly as defined in claim 1 and the other of said door hinge plates having a gap-closing tab projecting from the inner edge of the hinge plate into the space between spaced bearing portions thereof and extendable into close proximity to the surface of the bearing portion of the one plate and adapted to overlie the projection of the hinge pin keeper when the hinge plates overlie one another and the door is closed upon the door jamb so that access of a prying tool to the keeper projection is prohibited and unrolling of the bearing portion prevented.

5. A tamper proof door butt hinge assembly as defined in claim 4 and said gap-closer tab being depressed so that its edge lines up tangentially with the outer surface of the bearing portion to permit the edge to be in closest proximity with the curved other surface of the bearing portion of the one hinge plate.

6. A tamper proof door butt hinge assembly as defined in claim 5 and said depressed gap closing tab being relieved at its side edges of material slightly to permit the depression of the gap closer tab.

7. A tamper proof door butt hinge assembly as defined in claim 3 and said hinge pin keeper being formed of flat spring material and said projection of the keeper being spring bent into the keeper slot of the bearing portion of the one hinge plate.

8. A tamper proof door butt hinge assembly as defined in claim 7 and said shoulder area on the hinge pin being formed of a flat transverse cut on the exterior of the pin and providing lock shoulders at the opposite axial ends of the flat cutaway slot thereof.

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