

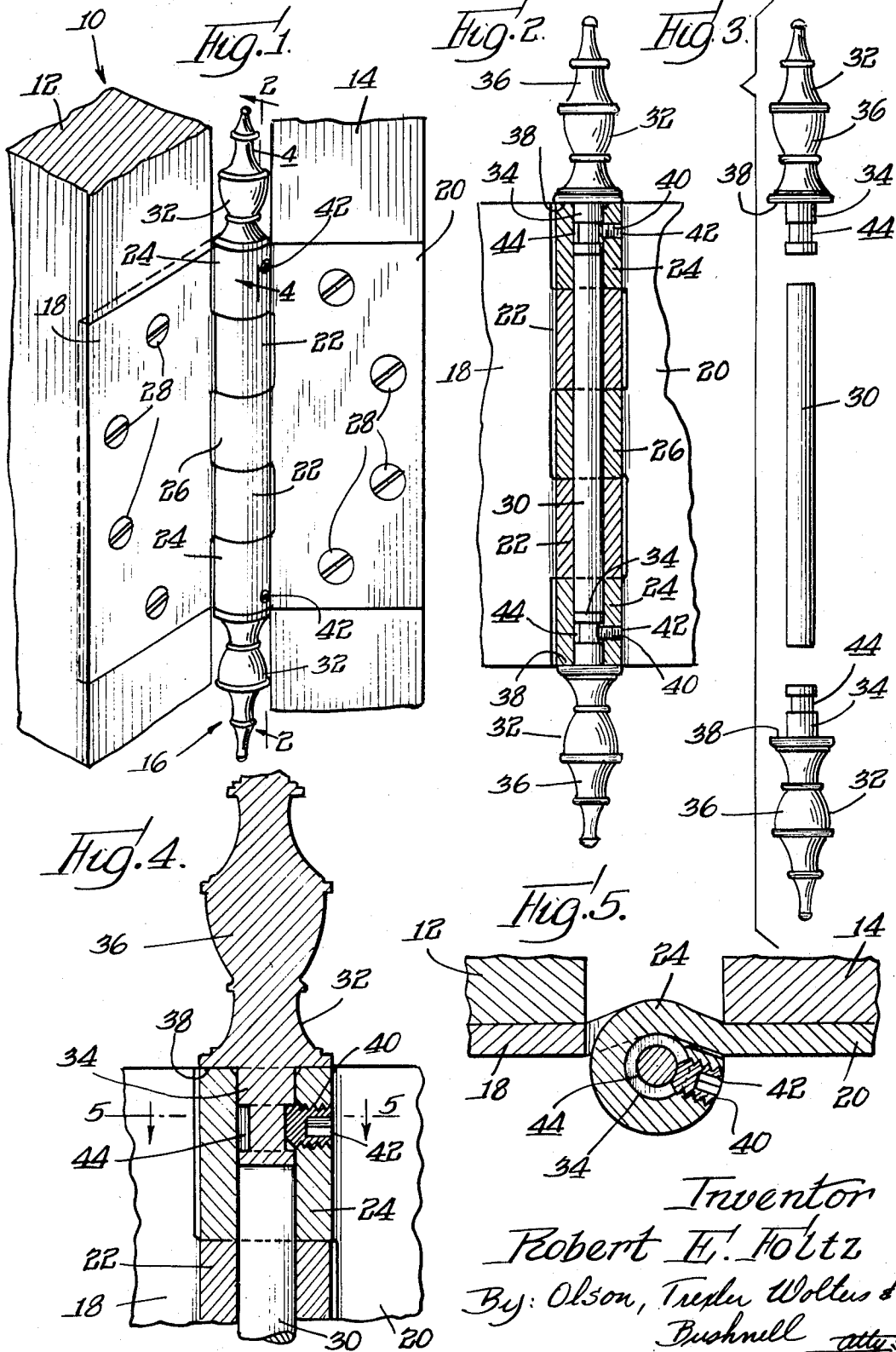
Nov. 4, 1969

R. E. FOLTZ

3,475,784

FLOATING PIN ARRANGEMENT FOR A BUTT HINGE

Original Filed Nov. 5, 1965



Inventor  
Robert E. Foltz  
By: Olson, Tiedler Wolters &  
Bushnell attys.

1

3,475,784

## FLOATING PIN ARRANGEMENT FOR A BUTT HINGE

Robert E. Foltz, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill., a corporation of Illinois  
Continuation of application Ser. No. 506,511, Nov. 5, 1965. This application June 28, 1968, Ser. No. 750,673  
Int. Cl. E05d 5/12

U.S. Cl. 16-169

6 Claims

### ABSTRACT OF THE DISCLOSURE

A butt hinge having a freely rotatable hinge pin positively axially located by separate end elements individually mounted in the end knuckles.

This application is a continuation of Ser. No. 506,511 filed Nov. 5, 1965, now abandoned.

This invention relates generally to door hardware and more particularly to pivot pin arrangements for butt hinges.

The aesthetic desirability of preventing hinge pins from rising out of the cooperating hinge knuckles has long been recognized. However, the prior art mechanical arrangements for achieving this result have commonly involved a securing of the hinge pin to the upper end knuckle, either by a threaded connection or by fashioning the pin to engage the end knuckle with an interference fit. Such schemes concentrate wear at regions of the pin which are associated with a relatively moving knuckle, producing excessive wear at these regions and a chattering action of the hinge in time. In the case of pins that are fashioned with decorative finials, pilferage is an added problem. The decorative tips are easily grasped by the fingers of souvenir hunters pursuant to their removal.

An important object of the present invention is therefore to provide a new and improved pin arrangement for butt hinges which overcomes the foregoing difficulties of the prior art.

Another object of the invention is to provide a butt hinge that is arranged for positive axial positioning of a freely rotatable hinge pin.

Still another object of the invention is to provide a butt hinge that is arranged for replacement or exchange of decorative finials without extracting the hinge pin from the aligned knuckles.

A further object of the invention is to provide a decorative type butt hinge that is arranged to prevent pilferage of the finials.

These and other objects and features of the invention will become more apparent from a consideration of the following descriptions.

In order that the principles of the invention may be readily understood, a single embodiment thereof but to which the application is not to be restricted, is shown in the accompanying drawing wherein:

FIG. 1 is a perspective view of a door installation incorporating a butt hinge constructed in compliance with the invention;

FIG. 2 is an enlarged elevational view taken substantially along the line 2-2 of FIG. 1;

FIG. 3 is an elevational view of the end elements and hinge pin used in the butt hinge of FIGS. 1 and 2;

FIG. 4 is a further enlarged view taken substantially along the line 4-4 of FIG. 1 and showing the means for retaining an end element in the corresponding end knuckle; and

FIG. 5 is a plan view in cross-section taken substantially along the line 5-5 of FIG. 4.

Referring now in detail to the drawing, specifically to

2

FIG. 1, a door installation 10 includes a door 12 that is hung to a jamb 14 by means of a plurality of butt hinges 16, one of which is illustrated. In accordance with conventional practice, the butt hinge 16 includes a pair of hinge leaves 18 and 20; and the leaves 18 and 20 are fashioned with integral, tubular hinge knuckles. Specifically, leaf 18 is provided with a pair of axially spaced, medial knuckles 22, and leaf 20 is fabricated to comprise a pair of end knuckles 24 and a medial knuckle 26, knuckle 26 being axially spaced from the end knuckles to admit the knuckles 22 therebetween in interfitting relationship. In addition, the leaves 18 and 20 are perforated to pass suitable fasteners, such as wood screws 28 into engagement with the material of door 12 and jamb 14.

Turning to FIGS. 2 and 3, the leaves 18 and 20 are united by means of a cylindrical pin 30 that is slidably and rotatably disposed in the aligned bores of knuckles 22, 24 and 26. For purposes of retaining the pin 30, end elements 32 are fashioned for assembly to the end knuckles 24. More specifically, each end element 32 includes an abbreviated stem portion 34 which is formed integral with a decorative finial 36. While a "cathedral" style of finial has been shown, it is to be recognized that other styles of finials and, in fact, other types of tips may be incorporated in the end elements 32. In the decorative tip provided in the illustrated embodiment, an annular transverse shoulder 38 surrounds the stem portion 34 for abutting engagement with the end surface of the corresponding end knuckle, as is shown in FIG. 2.

In compliance with the features of the present invention, means are provided to act between each of the end knuckles 24 and the corresponding end elements 32 to preserve the assembled condition thereof; and turning to a consideration of FIGS. 4 and 5, a typical end knuckle 24 is seen to be fashioned with a threaded, radial aperture 40 which opens into the bore of the end knuckle. A cooperatively threaded set screw 42 is turned into the aperture 40 to engage the stem portion 34 of the end element 32 so as to fix the end element in place. Advantageously, the stem portion 34 is provided with an annular, peripheral groove 44 that is aligned with the aperture 40 to receive the inner end of the set screw 42.

Having thus described the construction of the illustrated embodiment, it will be valuable now to describe the functional significance of the component parts. The hinge leaves 18 and 20 cooperate in the customary manner, and the floating hinge pin 30 rotates freely within the knuckles 22, 24 and 26 so as to distribute wear evenly along the entire length of the pin. Moreover, the abbreviated length of the stem portions 34 permits the hinge pin 30 to reside at least partially in the bores of the end knuckles 24 so as to provide an effective aligning function and to distribute forces comparatively equally among the several knuckles.

The end elements 32, being individually secured to the corresponding end knuckles, retain the hinge pin 30 in place and prevent it from falling or working its way out of the aligned hinge knuckles. Being separate from the hinge pin, the end elements 32 define no factor inhibiting the free reaction of the hinge pin to the relative rotation of the end and medial knuckles upon opening and closing of the door 12. The set screws 42 effectively secure the end elements 32 to the corresponding end knuckles and prevent pilferage of the finials. Even if the set screws are not turned down snugly or even if the end elements are twisted with enough force to loosen the contact of the set screws, the side wall of the annular groove 44 acts as a stop against the end of the set screw to prevent extraction of the stem portion 34. It will also be recognized that the set screws 42 permit easy replacement of an end element 32 should one become damaged in use.

3

Moreover, one style of finial may be easily exchanged for another. Either operation is readily accomplished without extracting the hinge pin 30 from the aligned knuckles and therefore without disassembling the hinge leaves.

The specific example herein shown and described is to be considered as being primarily illustrative. Various changes will no doubt occur to those skilled in the art; and such changes are to be understood as forming a part of this invention insofar as they fall within the spirit and scope of the appended claims.

I claim:

1. A butt hinge comprising: a pair of cooperating hinge leaves having interfitting end and medial knuckles, said knuckles having aligned bores; an end element assembled to each of said end knuckles, each of said end elements including an abbreviated stem portion disposed in the bore of a corresponding end knuckle, each of said end knuckles having a threaded, radial aperture communicating with the bore thereof, and a set screw threadedly disposed in each of said radial apertures to secure each of said end elements against unauthorized axial displacement; and a cylindrical hinge pin freely, rotatably disposed in a plurality of said aligned bores between said end elements, said cylindrical hinge pin being independent from said stem portions for freely reacting to the relative rotation of said end and medial knuckles upon opening and closing of the associated hinge leaves.

2. A butt hinge as claimed in claim 1, wherein the hinge pin is freely, rotatably disposed in contact with the bore surfaces of the end medial knuckles for aligning the knuckles independently of said end elements.

3. A butt hinge as claimed in claim 2, wherein the ends of the hinge pin extend partially into the bores of the end knuckles for juxtaposition with the adjacent ends of the abbreviated stems of the end elements.

4

4. A butt hinge as claimed in claim 1, wherein said stem portion has a peripheral recess aligned with said radial aperture and wherein the set screw has the inner end situated in said recess.

5. A butt hinge comprising: a pair of cooperating hinge leaves having interfitting end and medial knuckles, said knuckles having aligned bores; an end element assembled to each of said end knuckles, each of said end elements including an abbreviated stem portion disposed in the bore of a corresponding end knuckle, and a hinge pin freely, rotatably disposed in contact with the bore surfaces of the end and medial knuckles between said end elements for aligning the knuckles independently of said end elements and being independent from said stem portions for freely reacting to the relative rotation of said end and medial knuckles upon opening and closing of the associated hinge leaves, the ends of the hinge pin extending only partially into the bores of the end knuckles for juxtaposition with the adjacent ends of the abbreviated ends of the end elements.

6. A butt hinge as claimed in claim 5, including means preventing unauthorized axial removal of the end elements.

#### References Cited

#### UNITED STATES PATENTS

|           |         |           |
|-----------|---------|-----------|
| 442,547   | 12/1890 | Radler.   |
| 1,189,201 | 6/1916  | Hurd.     |
| 493,190   | 3/1893  | Smith.    |
| 1,618,544 | 2/1927  | McKinney. |

BOBBY R. GAY, Primary Examiner

D. L. TROUTMAN, Assistant Examiner

35