Nov. 6, 1934. A. G. LYONS 1,979,894

BUTT HINGE CONSTRUCTION

Filed June 18, 1932

FIG. 1.

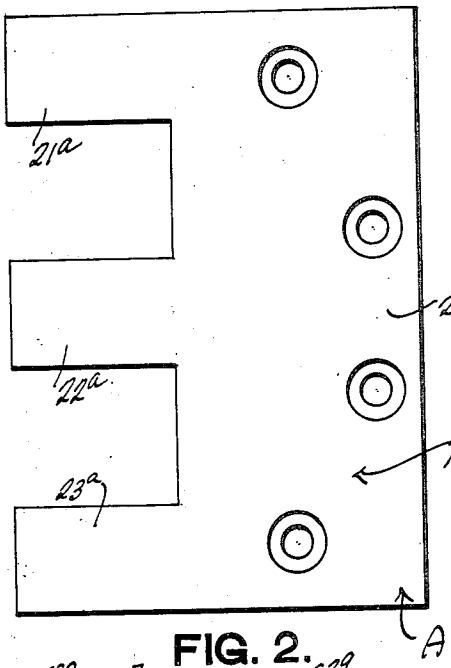


FIG. 4.

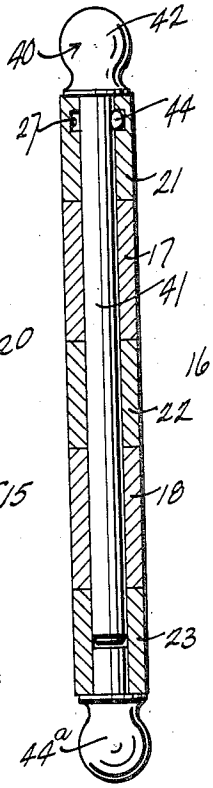


FIG. 3.

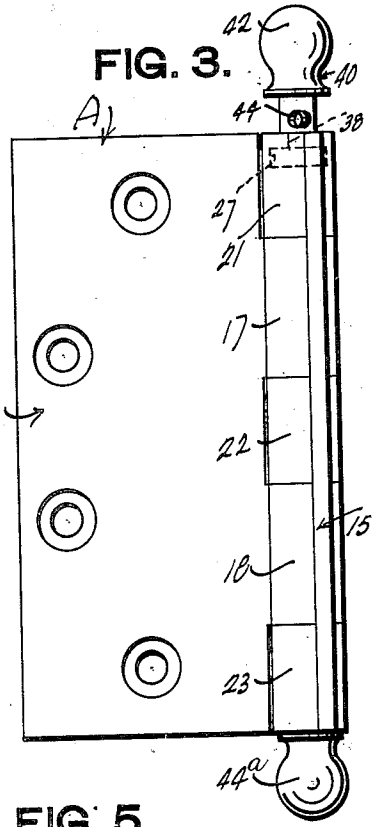


FIG. 2.

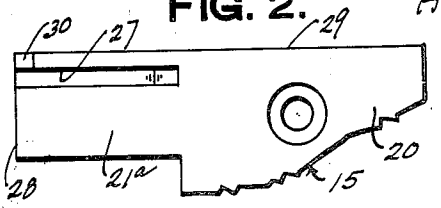


FIG. 5.

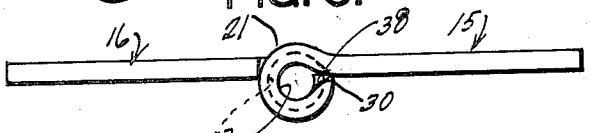


FIG. 8.

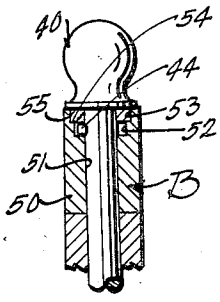


FIG. 10.

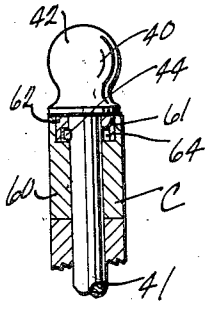


FIG. 6.

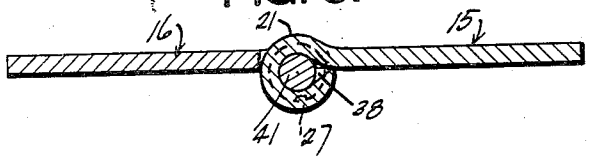


FIG. 7.

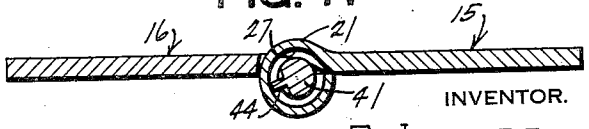


FIG. 9.

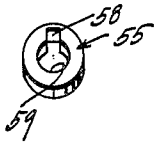
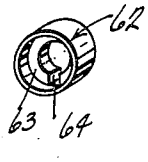


FIG. 11.



INVENTOR.

Arthur G. Lyons

BY Lancaster, Allwine and Rommel

ATTORNEYS.

Patented Nov. 6, 1934

1,979,894

UNITED STATES PATENT OFFICE

1,979,894

BUTT HINGE CONSTRUCTION

Arthur G. Lyons, Pennside, Pa., assignor to Reading Hardware Corporation, Reading, Pa., a corporation

Application June 18, 1932, Serial No. 618,052

4 Claims. (Cl. 16—169)

This invention relates to improvements in butt hinges.

The primary object of this invention is the provision of an improved butt hinge having relatively simple and improved means to prevent the rising of the hinge pin of the butt hinge.

A further object of this invention is the provision of an improved method of constructing a bent steel hinge with improved means to prevent the rising and accidental detachment of a hinge pin.

A further object of this invention is the provision of improved hinge pin retaining means for the butt parts of cast metal butt hinges.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, wherein for the purpose of illustration are shown preferred and modified forms of the invention,

Figure 1 is a front elevation of a die stamped steel butt hinge part.

Figure 2 is a fragmentary view of the upper part of said part showing subsequent steps in the formation thereof.

Figure 3 is a view showing the butt hinge part in assembled relation with the pin in the act of being inserted to its final position in the barrel or knuckle portions of the butt hinge parts.

Figure 4 is a vertical sectional view taken through the hinge pin, and showing the barrel portions of the butt hinge parts in assembled relation, with the improved features to prevent accidental rising of the hinge pin.

Figure 5 is a top plan view of the butt hinge parts with the hinge pin removed.

Figure 6 is a cross sectional view taken through the butt hinge parts with the pin in place immediately above the annular keyway.

Figure 7 is a sectional view taken through the hinge butt parts and intersecting with the key projection of the pin, showing it in the retaining groove of the barrel of one of the hinge butt parts.

Figure 8 is a fragmentary sectional view showing a modified form of hinge pin retaining means used in cast metal butts.

Figure 9 is a perspective view of a pin retaining washer which is used in the butt hinge part knuckle of Figure 8.

Figure 10 is a fragmentary view, partly in section, showing a modified means for retaining a hinge pin in the butt hinge knuckle of a cast metal butt hinge part against rising.

Figure 11 is a perspective view showing the type of retaining washer used in the hinge of Figure 10.

In the drawing, wherein similar reference characters designate corresponding parts throughout the several views, the letter A may generally designate the improved steel hinge and its pin retaining means, as shown in Figures 1 to 7 inclusive, and the letters B and C may generally designate the forms of invention shown in Figures 8 and 10.

Referring to the form of invention A, the same is of steel or metal which may be die-stamped and bent to form. The hinge A includes the parts 15 and 16; the latter having aligning barrel or knuckle portions 17 and 18 in spaced relation and the former having its front body plate 20 provided with barrel or knuckle portions 21, 22, and 23 adapted to fit respectively above, between, and below the barrel portions 17 and 18 of the butt hinge part 15, as is usual. The butt hinge part 15 is die-stamped initially, in the form shown in Figure 1 of the drawing, with the knuckle providing extensions 21^a, 22^a and 23^a in the same plane as the body plate 20. Thereafter the inner face of the knuckle providing extension 21^a, as is shown in Figure 2 of the drawing, is grooved or milled at 27 from the outer periphery 28 thereof to a point adjacent the juncture of the extension 21^a with the body portion 20 of the butt hinge part; this groove 27 being parallel with and immediately below the top edge 29 of the butt hinge part 15. The groove 27, for its full depth, opens on the edge 28, as shown in Figure 2. In the next operation the butt extension 21^a is beveled or cut away at 30 on the inner face thereof at the upper corner immediately above the groove 27 and at the outer end of the extension 21^a. The barrel or knuckle providing extensions 21^a, 22^a and 23^a are then bent or rolled into barrel form, with the passageways 35 thereof in alignment. Inasmuch as the groove 27 and bevel 30 are on the inner face of the extension 21^a the groove 27 will now define an annular passageway countersunk in the knuckle 21 below the top edge thereof, having access directly thereto only through an entrance way 38 provided by the bevel 30, as is shown in Figure 5 of the drawing.

The pin 40 has the usual pintle shank 41 and a head 42; the shank 41 of course being slipped downwardly through the aligning passageways of the barrel portions of the butt hinge sections. The shank 41 adjacent to the head 42 is preferably provided with a short radial or lateral extension 44, preferably formed by crimping the material of the shank at opposite sides, as shown in Figures 4 and 7 of the drawing.

In assembling the hinge sections the knuckle portions are of course aligned and the shank 41 inserted in the passageways of the knuckle portions. The extension 44 is slipped through the passageway 38 which is formed by the bevel 30, as shown in Figure 5, and when the extension 44 contacts upon the lower edge of the groove 27 the pin 40 is given a partial turn to position the extension 44 laterally of the key passageway 38. In this position the head 42 will rest on the top

barrel of the hinge section 15, as shown in Figure 4 of the drawing, and the pin will be locked in positon upon the hinge butt section 15 against liability of accidental rising due to relative movement between the hinge sections.

The usual dummy head 44a is provided upon the bottom knuckle 23 of the hinge section 15.

It is to be particularly noted that the key way or groove 27 is located in the uppermost knuckle of the butt hinge, so that the pintle shank 41 is entered within the passageway of each of the knuckles making up the butt hinge before the key 44 enters the passageway 38. This enables a facile assemblage of the hinge parts and permits of a ready disassemblage.

Referring to the form of invention B, the same is preferably intended for butt hinges made of cast metal, but it is to be understood that the features for retaining the pin in place are not to be limited to such type of butt hinge. In the formation, the pin retaining means of the barrel 50 is provided with the usual pin receiving passageway 51 therethrough. An annular key socket 52 is reamed in the butt barrel 50 from the top thereof, and a pin retaining washer socket 53 of greater diameter than the key socket 52 is reamed in the upper portion of the knuckle 50 above the socket 52, and of a larger diameter. These annular sockets 52 and 53 being in stepped relation provide a shoulder 54 at their juncture. A pin retaining washer 55 of bronze or other material is provided, with a depth equal to the depth of the socket 53, and is driven or otherwise fixedly fitted into the annular socket 53 against the seat 54. In this position the top surface of the washer 55 lies flush with the top end surface of the barrel portion 50 of the butt hinge section, as shown in Figure 8. The washer overhangs the annular key socket 52 to provide a groove therewith. The washer 55 is provided with a key lug entrance slot 58 opening into the passageway 59 through the washer 55; said passageway 59 being of the same diameter as the pin-way 51 of the butt hinge sections. The pin is of the same shape and characteristics as the pin 40 above described, and is assembled similar to the hinge A above described; the key 44 being slipped through the slot 58 into the keyway 52 and given an angular turn of less than 360° to position the key beneath a retaining portion of the washer 55. Due to the force fit of the washer 55 in the knuckle 50 it is quite apparent that the pin 40 will be prevented from rising accidentally.

In the form of invention C the knuckle 60 of one of the hinge sections, which of course is the topmost knuckle, is annularly reamed at 61 inwardly from the top thereof, with a uniform diameter from the top edge of the knuckle 60. A retaining washer 62 is force driven into this socket 61. The washer 62 is undercut, providing an annular shell portion having an annular flange therein for a portion of its depth to provide the annular shoulder 63. The reduced end of the washer 62 lies lowermost in the reamed socket 61 to thus provide an annular keyway 64 in the knuckle 60 surrounding the usual pin receiving passageway of the knckle. The upper thicker portion of the washer 62 has a key lug entrance slot 64 cut therethrough, which will permit the key lug 44 of the shank 41 of the pin 40 to slip into the plane of the key passageway 64, as shown in Figures 10 and 11 of the drawing.

Various changes in the shape, size, and arrangement of parts may be made to the forms of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a hinge the combination of hinge sections having barrel portions provided with aligning passageways therethrough, a connecting pin in the passageways of said barrel portions, one of said barrel portions at an end thereof having an annular socket surrounding the pin passageway through said barrel portions, and a pin retaining washer rigidly seated therein and providing an annular keyway surrounding said pin passageway, said washer having a key entrance slot to said annular keyway, and said pin having a key lug thereon for removable seating in said annular keyway.

2. In a butt hinge the combination of butt sections having pintle receiving knuckles thereon with pintle passageways therethrough, a pintle having a key lug laterally extending therefrom, one of said knuckles having an enlarged socket reamed inwardly of an end thereof surrounding said pintle passageway, and a pin retaining washer force fitted into said enlarged socket and providing a bayonet slot in the socket surrounding the pintle pin passageway for bayonet joint association with the key lug of said pin.

3. In a hinge structure the combination of hinge sections having knuckles provided with aligning passageways, a pintle for said passageways having a key lug thereon, a knuckle of the hinge inwardly from an end thereof having a pair of annularly reamed sockets surrounding the pin passageway of the knuckle and of greater diameter than the passageway, said sockets being of different diameters with the one of greater diameter uppermost and opening on the end of said knuckle, and a pin retaining washer force fitted into the socket of larger diameter and overhanging the other socket to define an annular keyway for the pin key lug, said washer having a slot therethrough as an entrance for the key lug to said annular keyway.

4. In a hinge the combination of hinge sections having pintle receiving knuckles thereon with pintle passageways therethrough, one of the knuckles having inwardly from an end thereof an enlarged annularly reamed socket, a pintle for said knuckles having a key lug thereon, and a pintle retaining washer force fitted into said socket having an annular key lug groove surrounding the pintle passageways therethrough and an entrance slot to said annular keyway opening at an end of the washer.

ARTHUR G. LYONS.