April 14, 1931. J. P. McKINNEY, JR 1,800,311

HINGE

Filed Feb. 14, 1928

Fig. 1.

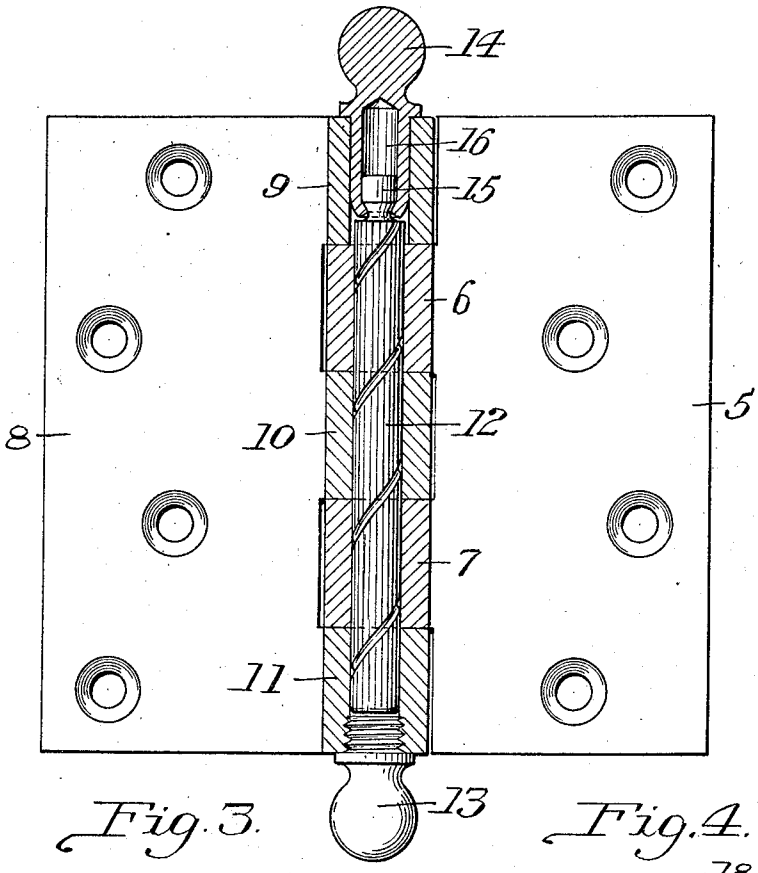


Fig. 2.

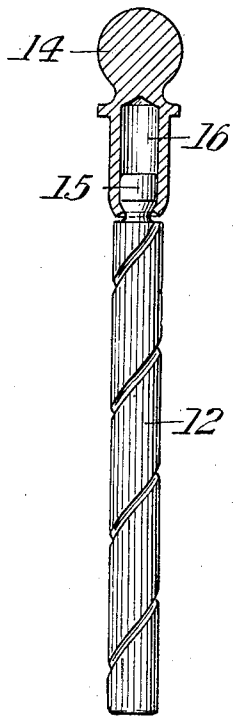


Fig. 3.

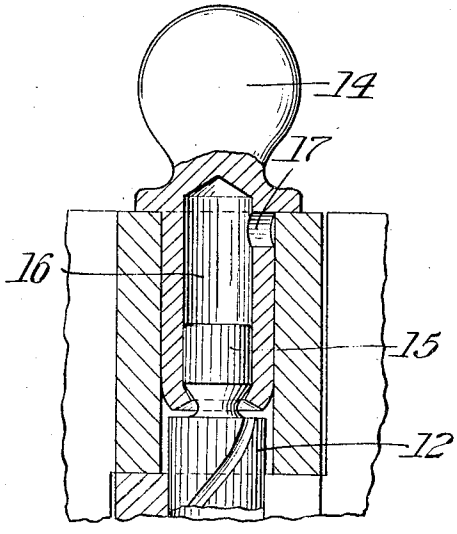
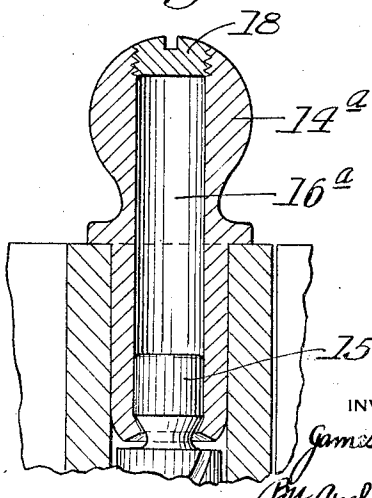


Fig. 4.



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Patented Apr. 14, 1931 1,800,311

UNITED STATES PATENT OFFICE

JAMES P. McKINNEY, JR., OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO McKINNEY MANUFACTURING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

HINGE

Application filed February 14, 1928. Serial No. 254,178.

My invention relates to hinges, and more particularly to pintles therefor for holding the leaves or butts of the hinges in cooperating relation.

One object of my invention is to provide a hinge of improved form and one wherein the pintle will wear longer and give more effective service than hinge pintles of the prior art.

Another object of my invention is to provide a hinge pintle of such form that it will tend to rotate with respect only to one leaf and remain stationary with respect to the other leaf of a hinge.

A further object of my invention is to provide an improved means for lubricating hinge pintles.

Still another object of my invention is to simplify and improve generally the structure and operation of hinges.

Some of the forms which my invention may take are shown in the accompanying drawing wherein Figure 1 is a vertical sectional view of one form of hinge; Fig. 2 is a view showing the pintle of the structure of Fig. 1; Fig. 3 is a view on an enlarged scale of a portion of the structure of Fig. 1 and Fig. 4 is a view showing a modification of the device of Fig. 3.

Referring to Fig. 1, I show a hinge leaf or butt 5 having knuckles 6 and 7 formed thereon and a leaf or butt 8 that is provided with knuckles 9, 10 and 11. These parts may be of somewhat the usual form. A pintle 12 extends into the knuckles, 6, 7, 9, 10 and 11 to hold the leaves 5 and 8 in assembled relation in the usual manner. A ball tip 13 is screwed or driven into the bottom knuckle 11 to close the lower end thereof and to give a finished appearance to the hinge, while a ball tip 14 extends into the top knuckle to serve as a finishing element and to support the pintle as hereinafter described, and somewhat after the manner set forth in my Patent No. 1,618,544, dated February 22, 1927. The upper end 15 of the pintle 12 is of reduced diameter and extends into a recess 16 in the ball tip 14. The lower portion of the tip 14 serves as a bearing for supporting the pintle 12 against radial strains and its lowermost edge is bent in to hold the pintle and the tip in assembled relation.

The pintle 12 is of substantially uniform diameter throughout that portion below its extension 15 and its lower end has direct engagement with the inner wall of the knuckle 11 although a bushing may be provided around the lower portion of the pintle, if desired. The leaf 5 which is provided with the knuckles 6 and 7 is ordinarily secured directly to a door, while the leaf 8 is secured to a door jamb, although if desired, the leaf 8 can be secured to the door and the leaf 5 to the door frame. In any event, the points of greatest strain on the pintle will be at those portions lying within the knuckles 6 and 7, and at the upper and lower extremities of the pintle, which extremities lie within the knuckles 9 and 11.

Since the upper end of the pintle is of reduced diameter and turns within the bearing recesses 16 of the ball tip 14, there will be less frictional resistance offered by the knuckles of the leaf 8 to the turning of the pintle than in the case of the knuckles of the leaf 5, so that the pintle will tend to rotate with the leaf 5, particularly in view of the fact that the binding action of the leaf 5 upon the pintle is greater than in the case of the leaf 8 with its more widely spaced knuckles. These binding stresses ordinarily cause the cutting or wearing of grooves in the pintle on those points which come in contact with the knuckles 6 and 7, thereby shortening its life, so that it is important to have the pintle rotate with those knuckles 6 and 7 which tend to most strongly bind the same.

The ball tip 14 may be driven into the kunckle 9 so that it will be rigidly held in place with respect thereto and serve to prevent rising or upward gripping of the pintle 12.

The pintle 12 is provided with a spiral groove through which lubricant may flow from the recess 16 to the various knuckles. The recess 16 may be filled with lubricant before it is secured to the pintle, or a hole 17 may be provided through which lubri-

cant may be introduced into the recess 16 upon partially withdrawing the ball tip 14.

In Fig. 4, I show a ball tip 14*a* of modified form, provided with a recess 16*a* for the reception of lubricant, the recess being closed by a screw plug 18 that can be conveniently removed for filling the recess with lubricant. In this structure, the lower end of the ball tip will be turned inwardly to support a pintle 15*a* as in the other figures.

I claim as my invention:—

1. The combination with a hinge leaf having upper and lower knuckles and a hinge leaf having a knuckle disposed between the first-named knuckles, of a pintle having a reduced bearing portion at one end, and a sleeve-like bearing member disposed within one of the first-named knuckles and rotatably supporting the said reduced portion of the pintle, the pintle being of substantially uniform diameter throughout the remaining portions thereof which have bearing engagement with the other knuckles.

2. The combination with a hinge leaf having upper and lower knuckles and a hinge leaf having a knuckle disposed between the first-named knuckles, of a pintle extending into said knuckles and being of reduced diameter at one end thereof, and a tip extending into one of the first-named knuckles and having a bearing recess for the reduced portion of the pintle, the remainder of the pintle being of substantially uniform diameter and its other end having bearing engagement with the other one of the first-named knuckles.

3. The combination with a hinge leaf having upper and lower knuckles and a hinge leaf having a knuckle disposed between the first-named knuckles, of a pintle extending into said knuckles and having a reduced end, means in one of the first-named knuckles for rotatably supporting the reduced end of the pintle, the other end of the pintle having bearing engagement with the other one of the first-named knuckles, and a ball tip extending into the last-named knuckle and terminating at a point short of the last-named end of the pintle.

4. The combination with a hinge leaf having a knuckle and a second hinge leaf having a knuckle in axial alinement with the first-named knuckle, of a pintle extending into said knuckles and having an end portion of reduced diameter disposed within one of the knuckles, and a bearing member disposed within the last-named knuckle and rotatably supporting the said reduced portion of the pintle, the pintle being of substantially uniform diameter throughout its remaining portion.

5. The combination with hinge leaves having co-operating knuckles, of a pintle extending into said knuckles and having a reduced upper end, and a sleeve-like member rotatably supporting said upper end and having a recess for the reception of lubricant, the said sleeve-like member having an opening in its side through which lubricant may be introduced into said recess when said sleeve is at least partially withdrawn from the knuckle.

6. Hinge structure comprising hinge leaves having axially alined knuckles, a pintle extending into said knuckles and having bearing engagement therewith, the diameters of the bearing portions of the pintle within all but one of said knuckles being greater than its bearing portion in said one knuckle and the reduced pintle bearing portion being of such diameter that the pintle will normally turn in said knuckle when the hinge is operated.

In testimony whereof I, the said JAMES P. MCKINNEY, JR., have hereunto set my hand.

JAMES P. McKINNEY, JR.