Oct. 12, 1926. 1,602,422

J. H. WAY ET AL

PROCESS OF MANUFACTURING HINGES

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Fig. 1.

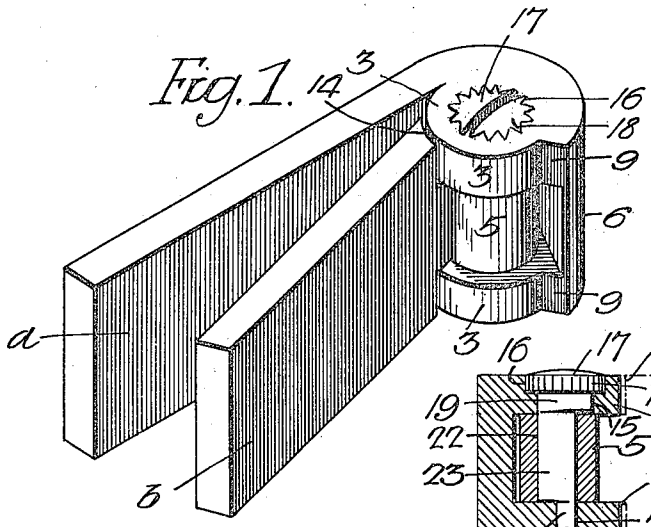


Fig. 2.

Fig. 4.

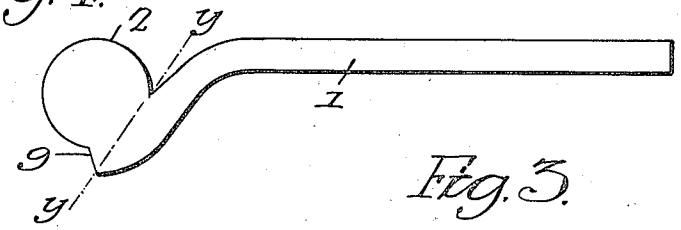


Fig. 16.

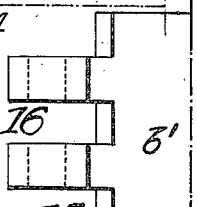


Fig. 3.

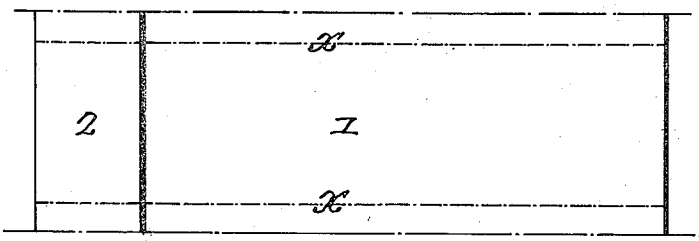


Fig. 15.

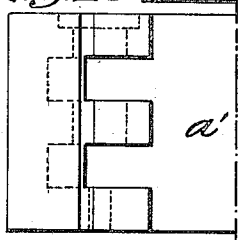


Fig. 17.

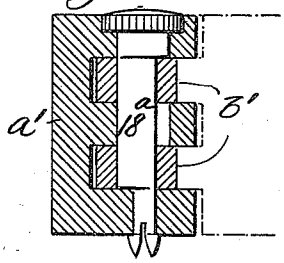


Fig. 6.

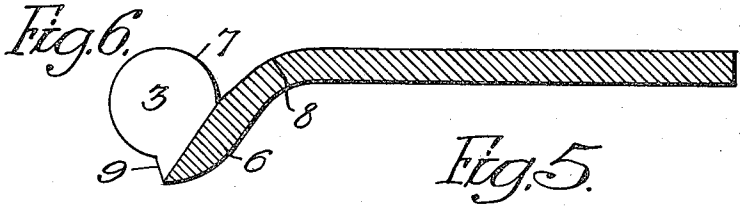
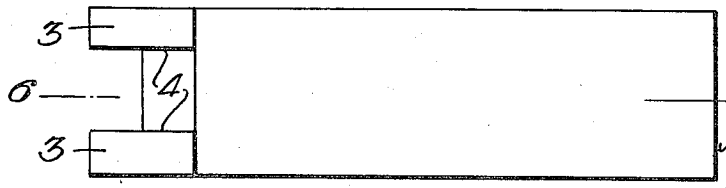


Fig. 5.



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Fig. 8.

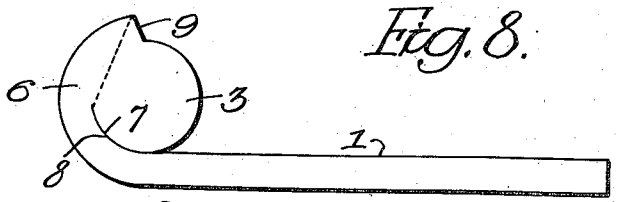


Fig. 7.

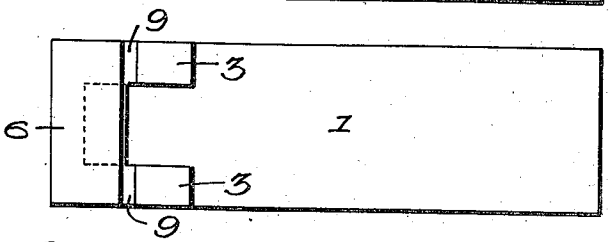


Fig. 10.

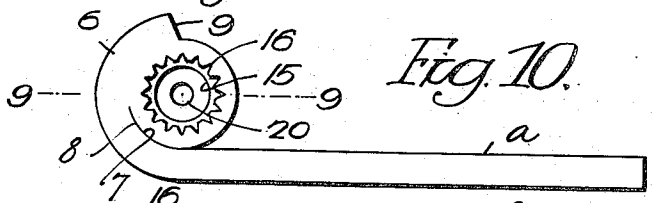


Fig. 9.

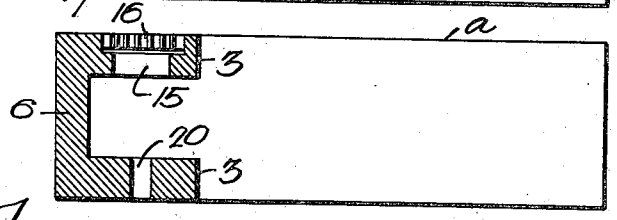


Fig. 11.

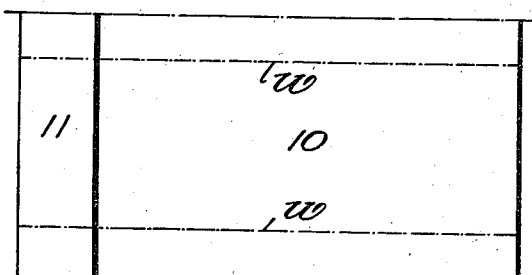


Fig. 12.

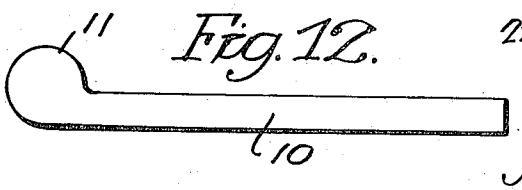


Fig. 14.

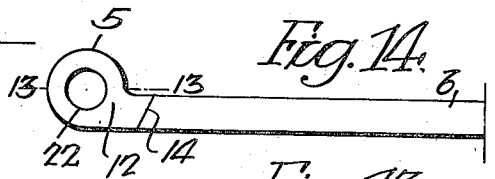
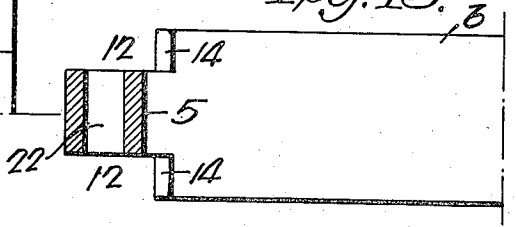


Fig. 13.



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1,602,422

UNITED STATES PATENT OFFICE.

JOHN HOWARD WAY AND ALBEN WARREN WAY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO ABSOLUTE ADJUSTABLE HINGE COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

PROCESS OF MANUFACTURING HINGES.

Application filed July 5, 1924, Serial No. 724,427. Renewed August 5, 1926.

This invention relates to certain improvements in hinges, in which the butts are enclosed.

The invention is especially adapted for use as a hinge for automobile doors, although it is not limited to such use.

The object of the invention is to improve the process of manufacturing hinges of this type so that they can be made in large numbers economically.

In the accompanying drawings: Fig. 1 is a perspective view of a hinge made in accordance with our invention; Fig. 2 is a sectional view of the hinge; Fig. 3 is a plan view illustrating one of the blanks of the hinge; Fig. 4 is a side view of the blank shown in Fig. 3; Fig. 5 is a plan view, showing the first step in shaping the blank; Fig. 6 is a sectional view on the line 6—6, Fig. 5; Fig. 7 is a plan view of the final shape of the blank; Fig. 8 is a side view of the blank shown in Fig. 7; Fig. 9 is a sectional view on the line 9—9, Fig. 10, showing the openings in the knuckles of the blank; Fig. 10 is a plan view of Fig. 9; Fig. 11 is a view of the blank on which the intermediate knuckle is formed; Fig. 12 is a side view of Fig. 11; Fig. 13 is a sectional view of the finished blank on which the intermediate knuckle is formed, the section being on the line 13—13, Fig. 14; Fig. 14 is a side view of Fig. 13; and Figs. 15, 16 and 17 are views of a five knuckle hinge.

Referring to Figs. 3 and 4, 1 is a blank having an enlargement 2 at one edge, formed by drop forging, or rolling. This blank may be of any length desired and is cut on the line x—x to the required width of the leaf a of the hinge, Fig. 1. The enlargement 2 is cut on the line y—y, Fig. 4, to form two knuckles 3, 3, which are spaced apart by the cut away portion 4 of a width equal to the knuckle 5 of the leaf b, as shown clearly in Figs. 5 and 6. The end of the blank is then rolled so that the portion 6 forms a closure for the hinge, and also acts as a stop to limit the movement of the leaf b. When the blank is rolled in this manner, as shown in Figs. 7 and 8, the portion 7 of the knuckles fits close against the portion 8 of the leaf. When the leaf is finished, the joint is scarcely perceptible.

It will be noticed that a blank is formed with an inclined portion 9 thereon, as shown in Fig. 4. This inclined portion, when the blank is rolled, as shown in Fig. 8, is at the proper angle to form a substantial stop for the leaf b of the hinge.

The leaf b of the hinge is made from a blank, as shown in Figs. 11 and 12. This blank can be of any length desired and is cut to the proper width on the line w—w, Fig. 11. The blank 10 has an enlargement 11 at one side of a diameter less than the enlargement 2 of the blank 1. This blank is then cut at each side, as at 12, leaving a portion 5, which forms the knuckle of the leaf b. The side cuts 12 are formed so as to produce a beveled edge 14, as shown clearly in Fig. 14. This beveled edge makes a comparatively close fit against the knuckles 3 of the leaf.

The knuckles of the leaf a are bored, as shown in Figs. 9 and 10. The upper knuckle has a large opening 15 therein, the upper portion of which is enlarged at 16. This portion is notched at its periphery to fit a head 17 of a pintle 18. The eccentric portion 19 of the pintle 18 fits the opening 15. There is a concentric opening 20 in the lower knuckle 3 of less diameter than the opening 15, and the concentric portion 21 of the pintle fits this opening. The lower end of this portion of the pintle is headed and is split so that, when the pintle is in position—as in Fig. 2—the enlargement holds the pintle in place. In the knuckle 5 is an opening 22. Located in this opening, when the hinge is assembled, is an eccentric portion 23 of the pintle, Fig. 2.

The hinge shown in Figs. 1 and 2 is an adjustable hinge. On turning the pintle, the leaf b can be adjusted in the leaf a so as to fit the door accurately to the door opening.

It will be understood that the invention can be used with a non-adjustable pintle of an even diameter throughout.

While the invention is described in connection with a three knuckle hinge, it will be understood that the process can be carried out in the manufacture of a five knuckle hinge, of a hinge having two or more knuckles.

Figs. 15, 16 and 17 illustrate a five knuckle hinge made in accordance with this invention.

Fig. 15 illustrates the leaf a' having three knuckles, and Fig. 16 illustrates the leaf b' having two knuckles spaced apart to fit in the recesses of the leaf a'. The two leaves are assembled, as shown in Fig. 17, with an eccentric pintle 18^a.

We claim:

1. The process herein described of making a leaf of a hinge, said process consisting in forming a blank with a rounded enlargement at one side, cutting the blank into sections the width of a leaf of the hinge, cutting the enlarged portion to form knuckles, then rolling the blank upon itself at the enlarged edge to form a protecting connecting section the width of a leaf, said section having a stop for the other leaf of the hinge, when the hinge is assembled.

2. The process herein described of making a hinged leaf, said process consisting in first forming a blank with an enlargement at one side, cutting the blank in sections the width of a leaf, then cutting through a section of the enlargement to produce two knuckles, and rolling the blank at the enlargement to form a closure for the knuckle portion of the hinge.

3. The process herein described of making a leaf of a hinge, said process consisting in forming a blank bent at one side and having a longitudinal enlargement, cutting the enlargement parallel to the bent body of the blank to form knuckles, then rolling the enlarged end of the blank so that the end will be rounded and the knuckles will fit against a portion of the rounded section, and finally perforating the knuckles for a pintle.

4. The process herein described of forming a leaf of a wrought metal hinge, said process consisting in forming a blank bent at one side and having a longitudinal enlargement at said side and an enlarged portion, which eventually forms a stop, cutting the enlargement on an inclined line substantially parallel with the incline of the blank to separate the enlargement to form knuckles, then rolling the blank at the enlargement so that the inclined portion of the blank will form a rounded closure for the hinge.

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