Sept. 8, 1936. W. R. LUSTIG 2,053,344

METHOD OF MAKING HINGES

Filed June 15, 1935

Fig. 5

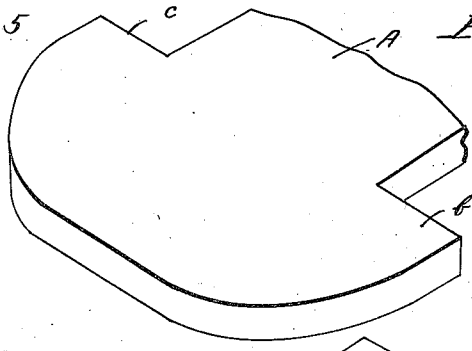


Fig. 6

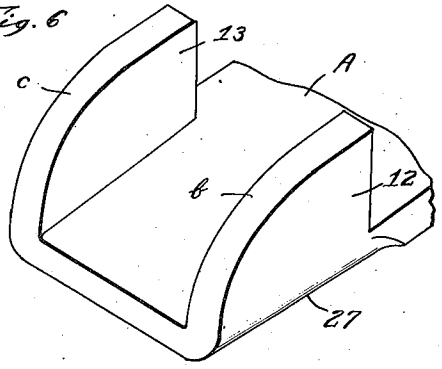


Fig. 7

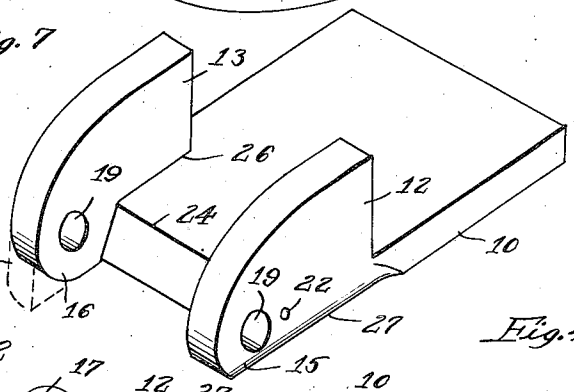


Fig. 2

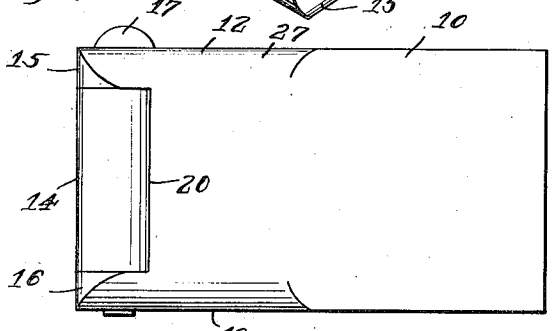


Fig. 4

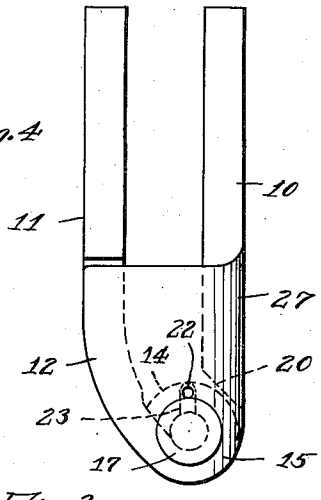


Fig. 1

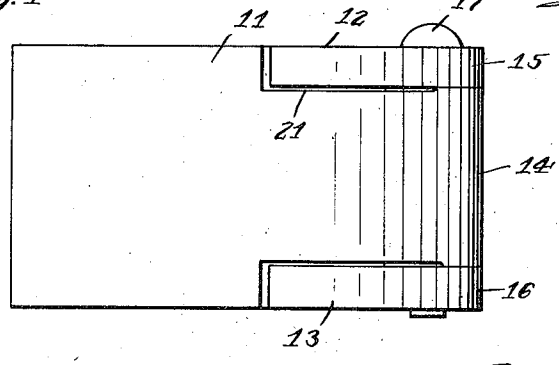
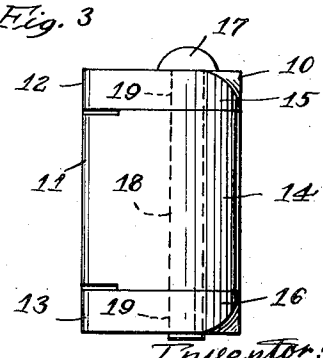


Fig. 3



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UNITED STATES PATENT OFFICE

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METHOD OF MAKING HINGES

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Application June 15, 1935, Serial No. 26,836

10 Claims. (Cl. 29—11)

This application is a continuation in part of my application Serial No. 14,777, filed April 5, 1935.

This invention relates to a method of manufacturing hinges, and more particularly the outer member of a closed type hinge especially designed and adapted for use on the doors of motor vehicles.

The principal object of my invention is to provide a method whereby the hinge member may be economically manufactured of sheet metal using the simpler blanking and forming operations, said method resulting not only in a hinge of lower cost, but also one of unusually good appearance and one having the requisite strength and rigidity.

In accordance with the present method, the outer member is blanked in one operation and formed in a second operation to provide top and bottom flanges, then the blank is milled from one end between the flanges to form knuckles on the ends of said flanges with a knuckle recess therebetween for the inner hinge member. A simple drilling operation to provide holes for the pintle in the knuckle portions of said flanges virtually completes the outer hinge member, there being only a slight grinding operation to give the desired shape to the periphery of the knuckle portions.

The invention is illustrated in the accompanying drawing, in which—

Figs. 1 and 2 are views looking at the opposite sides of a hinge made in accordance with my invention;

Fig. 3 is an end view thereof, and Fig. 4 a top view;

Fig. 5 is a perspective of the blank for the outer hinge member produced in the first operation;

Fig. 6 shows the same blank as it appears after the forming operation, and

Fig. 7 shows the completed outer hinge member produced by milling, drilling, and grinding the formed bank of Fig. 6.

The same reference numerals are applied to corresponding parts throughout the views.

Referring first to Figs. 1 to 4, the numerals 10 and 11 designate the outer and inner hinge members, respectively, arranged to be fastened in the usual way to the door and body pillar, respectively, on an automobile. That portion of the hinge member 10 projecting from the door is of channel-shaped cross-section to provide longitudinal top and bottom cover flanges 12 and 13, respectively, between which the exposed portion of the other hinge member 11 is received, when the knuckle 14 on the end thereof is pivotally connected to the projecting knuckles 15 and 16 by a pintle 17. The space between the inner and outer hinge members is therefore closed by the flanges 12 and 13 for better appearance and to exclude moisture. The shank of the pintle 17 has a working fit in the bore 18 of the knuckle 14 and a drive fit in the holes 19 in the knuckles 15 and 16, for obvious reasons. A slight clearance is provided at 20 between the knuckle 14 and the end of the hinge member 10 sufficient to avoid scraping of the knuckle in the opening and closing of the door, and yet not sufficient to detract from the closed appearance of the hinge or give rise to much danger of moisture entering and interfering with the easy operation of the door. The ends of the knuckle 14 are slightly in relief with respect to the top and bottom edges of the hinge member 11 so as to leave a slight clearance, as indicated at 21, between the flanges 12 and 13 and the edges of the member 11. In that way, the closed appearance is maintained on the back of the hinge, and easy operation is insured, and all end thrust is assumed where the knuckle portions 15 and 16 of the flanges 12 and 13 have abutment with the ends of the knuckle 14. An oil hole 22 is preferably provided in the top flange 12 alongside the pintle 17 arranged to register with a depression 23 formed in the upper end of the knuckle 14, extending radially from the bore 18 and formed suitably by means of a punch. Oil supplied to this depression through the hole 22 will travel the full length of the bore 18 and thus keep the hinge well lubricated so as to operate easily and quietly.

It should appear from the foregoing description that the hinge of my invention is attractive in appearance when viewed from any direction, all sides giving substantially the appearance obtained on the front, top and end of a covered joint hinge but not obtained in such hinges on the back. Obviously, since the back of the hinge is just as much exposed as the front, it is just as important that that side have a good appearance. Observing Figures 1—4, it is readily apparent that this closed type hinge has the same flush, covered appearance on all sides.

Both hinge members are preferably formed from sheet metal. The inner member 11 is blanked and pierced in one operation, and the end of the blank thus produced is formed into the hinge knuckle 14 in two operations—one known as a "break down" and the other as a "curling" operation. The steps in making the outer hinge memebr 10 are illustrated in Figs. 5 to 7. The outer member is stamped from sheet metal to produce the blank A shown in Fig. 6. Similarly as in the case of the inner hinge member, the blank for the outer hinge member is pierced in the same operation to provide the usual bolt holes required in the fastening of the hinge member to the door. It will be observed that the blank has laterally projecting end portions *b* and *c* to provide stock for the flanges 12 and 13, respectively, and the knuckle portions 15 and 16 coex-

tensive therewith. In the next operation, the projecting portions *b* and *c* are bent into parallelism, as in Fig. 6, to provide the top and bottom cover flanges **12** and **13**. In a third operation, the end of the blank is milled between the flanges **12** and **13** to the extent indicated at **24** to provide the space for the knuckle **14** between the knuckle portions **15** and **16** defined at the ends of the flanges **12** and **13**, respectively, and at the same time provide for the clearance **20**, previously referred to, for the knuckle **14**. The knuckle portions **15** and **16** can now be drilled to provide the pintle holes **19** and oil hole **22**. This substantially completes the outer hinge member, there being only a slight grinding off necessary to round off the periphery of the knuckle portions by removal of the stock indicated in dotted lines at **25**. The flanges **12** and **13**, it will be noted, are bent along lines **26** spaced inwardly sufficiently from the longitudinal edges of the blank to have the outer surfaces of the resulting flanges substantially in a common plane with the longitudinal edges of the blank, as clearly appears in Figs. 6 and 7. This greatly increases the strength of the hinge member and at the same time makes for much better appearance. The extra width in the shank portion enables placing the screw or bolt holes farther apart and the hinge mounting is accordingly stronger and less apt to loosen. In the bending of these flanges, rounded longitudinal edges **27** are formed which greatly improve the appearance of the hinge. The fact that the end of the blank is milled out between the flanges to the line **24** assures the desired flat parallel surfaces on the inside of the knuckle portions **15** and **16** for abutment with the ends of the knuckle **14** of the inner hinge member.

It is believed the foregoing description conveys a good understanding of my invention. The appended claims have been drawn with a view to covering all legitimate modifications and adaptations.

I claim:

1. The method of making the outer member of a covered type hinge which comprises punching a blank of the desired shape from a piece of sheet metal to provide a fastening shank portion and a wider end portion, then bending the opposed edge portions of the end portion into parallelism to provide parallel flanges, then milling out at the end of the blank between the flanges to define parallel knuckle portions on the ends of the flanges with sufficient clearance therebetween to receive the knuckle end of an inner hinge member, and finally perforating the knuckle portions in coaxial alignment to receive a hinge pintle.

2. The method of making the outer member of a covered type hinge which comprises punching a blank of the desired shape from a piece of sheet metal to provide a fastening shank portion and a wider end portion, then bending the opposed edge portions of the end portion into parallelism to provide parallel flanges, then removing stock from the end of the blank between the flanges so as to define parallel knuckle portions on the ends of said flanges, and then perforating the knuckle portions to receive a hinge pintle.

3. The method set forth in claim 2, including removing the corners of the knuckle portions substantially on arcs with the pintle holes as centers.

4. The method set forth in claim 2 which includes in the last-mentioned step further perforating one of the flanges in spaced relation to the pintle hole to provide an oil hole in said flange.

5. The method of making the outer member of a covered type hinge which comprises punching a blank of the desired shape from a piece of sheet metal to provide a fastening shank portion and a wider end portion, then bending the opposed edge portions of the end portion on parallel lines spaced inwardly from the longitudinal edges of the shank portion, whereby to provide parallel flanges whose outer surfaces are in planes substantially coincident with the longitudinal edges of the shank portion, then removing stock from the end of the blank between the flanges so as to define parallel knuckle portions on the ends of said flanges, and then perforating the knuckle portions to receive a hinge pintle.

6. The method of making the outer member of a covered type hinge which comprises punching a blank of the desired shape from a piece of sheet metal to provide a fastening shank portion and a wider end portion, then bending the opposed edge portions of the end portion into parallelism to provide parallel flanges, then milling out stock at the end of the blank between the flanges so as to define knuckle portions on the ends of the flanges having flat parallel inside faces adapted to bear against the ends of the knuckle portion of an inner hinge member, and thereafter drilling aligned pintle holes in the knuckle portions.

7. The method set forth in claim 5 including removing the corners on the knuckle portions substantially on arcs with the pintle holes as centers.

8. The method of making the outer member of a covered type hinge which comprises making a blank of the desired shape from a piece of sheet metal to provide a fastening shank portion and a wider end portion, then bending the opposed edge portions of the end portion into parallelism to provide parallel flanges, and removing stock from the end of the blank between the flanges so as to define parallel knuckle portions on the ends of said flanges.

9. The method of making the outer member of a covered type hinge which comprises making a blank of the desired shape from a piece of sheet metal to provide a fastening shank portion and a wider end portion, then bending the opposed edge portions of the end portion on parallel lines spaced inwardly from the longitudinal edges of the shank portion, whereby to provide parallel flanges whose outer surfaces are in planes substantially coincident with the longitudinal edges of the shank portion, and removing stock from the end of the blank between the flanges so as to define parallel knuckle portions on the ends of said flanges.

10. The method of making the outer member of a covered type hinge which comprises making a blank of the desired shape from a piece of sheet metal to provide a fastening shank portion and a wider end portion, then bending the opposed edge portions of the end portion into parallelism to provide parallel flanges, and then cutting out stock at the end of the blank between the flanges so as to define parallel knuckle portions on the ends of said flanges and so as to form the end of the blank between the flanges at an acute angle with respect to the longitudinal plane of said blank.

WALTER R. LUSTIG.