Apr. 10, 1923. 1,451,401

T. E. MURRAY ET AL

AXLE HOUSING AND METHOD OF MAKING SAME

Filed Nov. 30, 1921

Fig. 1,

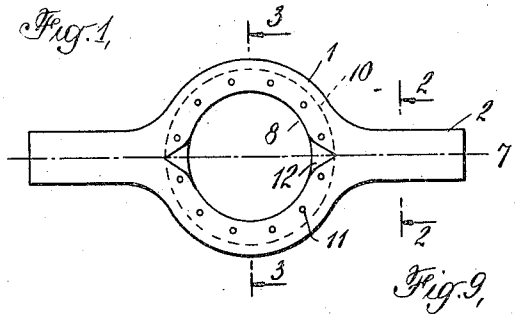


Fig. 2,

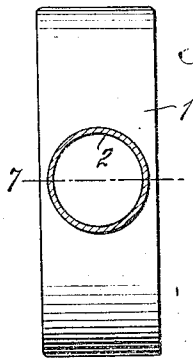


Fig. 9,

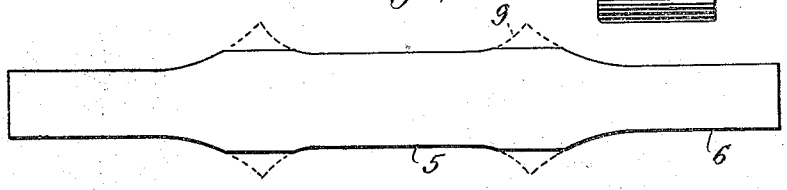


Fig. 3,

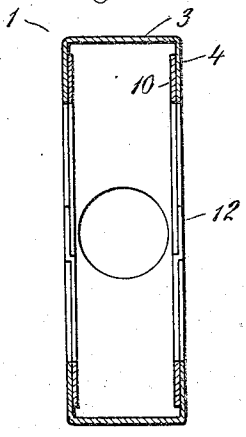


Fig. 4,

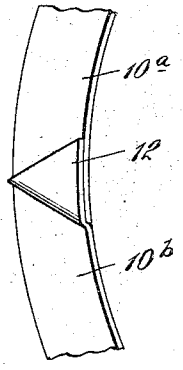


Fig. 5,

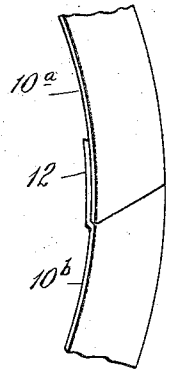


Fig. 6,

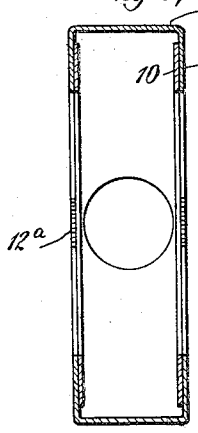


Fig. 7,

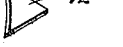
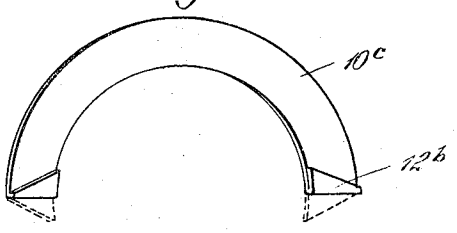


Fig. 8



INVENTORS

Thomas E. Murray

Thomas E. Murray, Jr

BY

D. Anthony Mina

ATTORNEY.

Patented Apr. 10, 1923. 1,451,401

UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY AND THOMAS E. MURRAY, JR., OF BROOKLYN, NEW YORK.

AXLE HOUSING AND METHOD OF MAKING SAME.

Application filed November 30, 1921. Serial No. 518,743.

To all whom it may concern:

Be it known that we, THOMAS E. MURRAY and THOMAS E. MURRAY, Jr., citizens of the United States, residing in Brooklyn, Kings County, and State of New York, have invented certain new and useful Improvements in the Axle Housings and Methods of Making Same, of which the following is a specification.

Our invention aims to provide certain improvements in the construction and method of production of axle housings and similar structures such as are commonly used for the rear axles of automobiles, by which improvement certain economies are effected and certain other advantages referred to hereinafter are secured.

The accompanying drawings illustrate embodiments of the invention.

Fig. 1 is an elevation of a complete housing;

Fig. 2 is a cross-section on the line 2—2 on an enlarged scale;

Fig. 3 is a cross-section on the line 3—3 also on an enlarged scale;

Figs. 4 and 5 are perspective views illustrating opposite faces of a detail;

Fig. 6 is a section similar to Fig. 3, illustrating an alternative construction;

Fig. 7 is a perspective view of a detail of this construction;

Fig. 8 is a perspective view of part of a ring, illustrating a third alternative;

Fig. 9 is a development of a blank used in forming a segment of the housing.

Referring to the embodiment of the invention illustrated, the housing comprises a central enlargement 1 of annular shape with a transverse opening through which the gearing within is made accessible; tubular portions 2 for the axles being extended from the sides of the enlargement.

In making the housing, blanks are used of sheet metal of the form shown in full lines in Fig. 9. Such a blank is bent up transversely to form the outer ring 3 and flanges 4 of the enlargement and the semicircular segments of the tubular extensions; and is bent longitudinally to give the shape shown in Fig. 1. In Fig. 9 the wider central portion 5 of the blank forms the enlargement of the housing and the narrower portions 6 form the tubular extensions. Two such segments are then placed edge to edge and united along their meeting edges, preferably by welding. In order that the edges 7 along which the segments are united should run continuously to the circular line 8 constituting the inner edge of the enlargement, the blank would have to be of the shape shown in dotted lines in Fig. 9 with triangular portions 9 at the ends of the central portion 5 of the blank. This triangular part 9 being omitted, however, the edges 7 diverge, as shown in Fig. 1, where the tubular parts merge into the central enlargement. By omitting the triangular portions 9 from the blank there is a considerable saving of metal in cutting a number of such blanks from a sheet.

On the inner face of each of the flanges 4 (Fig. 3) there is provided a reinforcing ring 10 of sheet metal. Bolt holes 11 for the attachment of a cover plate pass through the flange and the reinforcing ring. The ring 10 extends across the diverging edges of the segments and thus closes the space left at this point and reinforces the construction.

Preferably also a filler is provided between the diverging portions of such edges, the outer face of which filler is flush with the outer face of the adjacent portions of the structure. Such a filler may be provided in a number of different ways. According to Figs. 3, 4 and 5 the ring 10 is formed of two halves 10^a and 10^b, the ends of which are cut obliquely and overlapped one on the other to provide a substantially triangular boss 12 which fills the space between the diverging edges of the blanks. The two half rings may be spot welded or otherwise fastened at their overlapping ends, or they may be assembled without preliminary fastening. When the parts are assembled and the edges 7 welded together they may be welded also to the edges of the part 12 and the two half rings 10^a and 10^b welded to each other.

In the construction shown in Figs. 6 and 7 the rings 10 are continuous and a separate triangular filler 12^a is welded thereon and serves to fill the space between the diverging edges 7 when the parts are assembled. Or the filler 12^a may be set in place and united to the segments or to the ring in other ways and at other stages of the operation.

According to Fig. 8 the ring is formed in half sections 10^c, each of which is cut to the shape shown in dotted lines and has its ends bent up to form projections 12^b

each of which will constitute half of the filler. When two such half rings are assembled the contacting end portions 12b thereof will constitute a complete filler. The rings and segments are united in any desired order. They may be welded for example to the edges of the formed segments or may be spot welded to the flange of the enlarged portion of the housing.

With housings made according to this invention there is a saving of approximately thirty percent in the quantity of steel used. The rings may be made of scrap steel cut in straight strips and bent up in the plane of the metal. Also this construction produces a stronger housing by tying the ring to the outer shell through the shoulders formed within the divergent edges.

Preferably the parts are welded together as described although it is essential only that the straight edges of the segments be united. It is also within our invention to unite such edges by various other means than welding.

The invention is applicable not only to axle housings, but to various other hollow structure and particularly to similar structures comprising a tubular portion merging into an enlarged portion with a transverse opening. It is not essential in all cases that the space between the diverging edges be filled. The ring or equivalent member may be of sufficient strength, or the segments themselves may be of sufficient strength to serve the intended purpose of the structure without the filling in of this space.

Or the space may be filled by the introduction of molten metal. For example, the ordinary arc welding machine may be employed to deposit the desired quantity of metal to fill this space and at the same time to weld the parts together at this point.

In a co-pending application of Thomas E. Murray, Jr., (No. 517,056 filed November 22, 1921) there is described a method of stamping out blanks for the segments used in making axle housings or the like, according to which the blanks are stamped out minus certain projections (the lateral projections 9 or the comparatively narrow end projections) and such projections are made of separate stampings welded to the blanks before bending them into segments. The present invention includes the same step of stamping out incomplete blanks and the addition of the necessary part or parts after the bending operation: either to the bent up segments before welding or to the welded structure.

Though we have described with great particularity of detail certain embodiments of our invention, yet it is not to be understood that the invention is restricted to the particular embodiments disclosed. Various modifications thereof, in detail and in the arrangement of the parts may be made by those skilled in the art without departure from the invention as defined in the following claims.

What we claim is—

1. An axle housing or the like comprising an enlargement with inward flanges and with a tubular extension from the side, said housing being formed of longitudinal segments the edges of which are united along the tubular extension but diverge where the latter merges into said flanges.

2. An axle housing or the like comprising an enlargement with inward flanges and with a tubular extension from the side, said housing being formed of longitudinal segments the edges of which are united along the tubular extension but diverge where the latter merges into said flanges, the segments being of substantially uniform width throughout the portions thereof forming the enlargement.

3. An axle housing or the like comprising an enlargement with inward flanges and with a tubular extension from the side, said housing being formed of longitudinal segments the edges of which are united along the tubular extension but diverge where the latter merges into said flanges and a supplementary member extending across the diverging edges of the segments.

4. An axle housing or the like comprising an enlargement with inward flanges and with a tubular extension from the side, said housing being formed of longitudinal segments the edges of which are united along the tubular extension but diverge where the latter merges into said flanges and a filler between the diverging portions of such edges.

5. An axle housing or the like comprising an enlargement with inward flanges and with a tubular extension from the side, said housing being formed of longitudinal segments the edges of which are united along the tubular extension but diverge where the latter merges into said flanges and a supplementary member extending across the diverging edges of the segments, said supplementary member having a portion constituting a filler between the diverging portions of such edges.

6. An axle housing comprising a central annulus with tubular extensions from opposite sides, the housing being formed of longitudinal segments the edges of which are united along the tubular extensions but diverge where the latter merges into the annulus.

7. An axle housing comprising a central annulus with tubular extensions from opposite sides, the housing being formed of longitudinal segments the edges of which are united along the tubular extensions but diverge where the latter merge into the an-

nulus and a ring applied to the face of the annulus and extending across the diverging edges of the segments.

8. An axle housing comprising a central annulus with tubular extensions from opposite sides, the housing being formed of longitudinal segments the edges of which are united along the tubular extensions but diverge where the latter merge into the annulus and a ring applied to the face of the annulus and extending across the diverging edges of the segments and shaped to constitute a filler between such diverging edges.

9. In the making of axle housings or the like by bending up segments from blanks of sheet metal and uniting such segments along their edges, the method which consists in stamping a number of such blanks minus certain projections from a sheet, bending such stampings into segmental shape and subsequently adding such projections.

10. In the making of hollow structures by bending up segments from blanks of sheet metal and uniting such segments along their edges, the method which consists in stamping a number of such blanks minus certain projections from a sheet, bending such stampings into segmental shape and subsequently adding such projections.

In witness whereof, we have hereunto signed our names.

THOMAS E. MURRAY.
THOMAS E. MURRAY, JR.