L. S. LACHMAN.

COMPOSITE METAL WORK.

APPLICATION FILED FEB. 8, 1918.

1,435,010. Patented Nov. 7, 1922.

Fig. 1

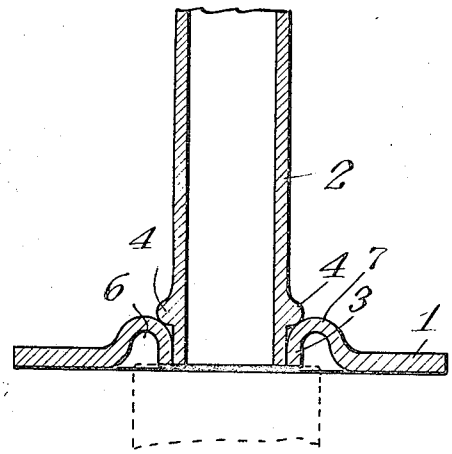


Fig. 2

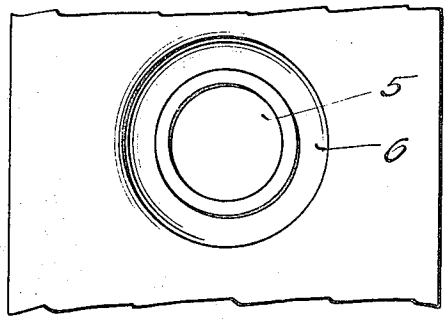
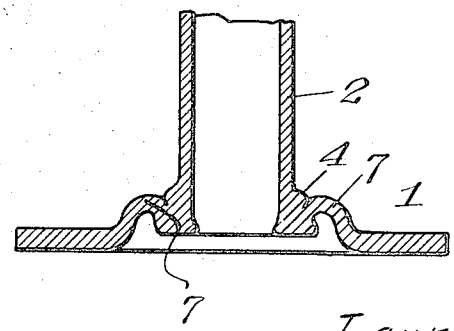


Fig. 3.



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LAURENCE S. LACHMAN, OF NEW YORK, N. Y.

COMPOSITE METAL WORK.

Application filed February 8, 1918. Serial No. 215,979.

To all whom it may concern:

Be it known that I, LAURENCE S. LACHMAN, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Composite Metal Work, of which the following is a specification.

My invention relates to those forms of composite metal work in which one element consists of a base and the other of a rod or standard rising from the base and united therewith.

The object of my invention is to secure strength in the composite structure particularly at the point of union as well as to attain ease and cheapness of manufacture and to permit the use, if desired, of the heating effects of a heavy electric current passed through the point of desired union to heat the parts to the desired degree of plasticity for securing, by the application of pressure, an integral or homogeneous joint.

In carrying out my invention I employ as a base member a piece of metal preferably in the form of a plate end for the projecting rod or stem I use a metal tube, the union being located on the side of said plate opposite that from which the tubular rod or stem projects, all as more particularly hereinafter described and then specified in the claims.

In the accompanying drawings:

Fig. 1 is a vertical central section through a tubular rod and base as assembled preparatory to the formation of the welded joint.

Fig. 2 is an inverted plan view of the perforated base.

Fig. 3 is a vertical central section through a piece of metal work the elements of which are secured together according to my invention.

1 indicates the base plate or element and 2 a tubular stem or rod projecting from one side thereof as shown. Said rod is located or positioned in a perforation in the plate 1 and the end thereof is integrally or homogeneously united as will be presently described with a flange 3 on the side of said plate opposite that from which the tube or rod 2 projects to produce a joint such as illustrated in Fig. 3 formed of upset metal of the edges of the flange and the edge of the tube at its end. An annular shoulder or flange 4 formed on the rod 2 engages the face or side of the plate opposite the flange so that in effect the plate 1 is locked between said annular shoulder and the annular homogeneous union between the end of the tube and the flange 3. The flange 3 surrounds the opening or perforation 5 in the plate 1, as shown, and may be formed in a stamp press constructed to produce the annular depression 6 from the bottom of which the flange 3 rises to a height approximately the same as the face of the plate 1, although in practice the edge of said flange might be located below the level of said face preparatory to the operation of forming the union, or might in fact rise slightly above the same. In any case it is preferable to so adjust the height of the edge of the flange that the finished union will lie below the level of the face of the plate 1 on the side on which the flange is formed.

In the stamping or forming operation the projection 7 will be naturally formed on the opposite face of plate 1 although this is not necessary to my invention. The annular shoulder 4 is preferably formed by the well known electrical forging operation which, by end pressure applied to the heated section of the rod, causes the same to swell out into the annular protuberance 4. By this construction of the annular shoulder I avoid any weakening of the wall of the tube 2 which would follow if the end thereof were turned down to produce a shoulder or offset for engagement with the plate or base 1.

To secure the parts together when assembled in the relation Fig 1 and thereby produce a joint of the construction shown in Fig. 3, a heating electric current and pressure in the axial line of the rod 2 may be applied by suitable electrodes, one adapted to engage the edge of the flange and the end of the rod and the other to grasp or engage the rod 2 at the opposite side of the plate 1 so as to permit the heating current to be passed from one to the other through the flange and edge or end of the tube 2. The heating and pressure results in an upsetting and welding or consolidating of the flange and tube with the substantial effect of producing a homogeneous joint comprising an enlarged mass of metal approximating the form shown in Fig. 3. In this operation the annular groove or depression 6 serves to receive in part the upset metal so that there will be in the fin-

ished work no projecting material beyond the face of plate 1 opposite the face from which the stem or tube 2 projects.

What I claim as my invention is:

1. Composite metal work comprising a base having a flange projecting from one face thereof and parallel to the axes of a tube projecting from the side of the base opposite that from which the flange extends and fitted within said flange as in a sleeve, said tube and base being joined to one another by an enlargement comprising upset metal of the edge of the tube and of the edge of the flange consolidated in a homogeneous or integral whole.

2. Composite metal work comprising a base having a perforation, a tube located in said perforation and projecting from one side of the base, a flange projecting from the opposite side of the base and bounding the perforation within which the tube is located as in a sleeve, said base having an annular depression surrounding the flange and said flange and tube having their edges united in a homogeneous or integral whole as and for the purpose described.

3. Composite metal work comprising a perforated base, a tube located in said perforation and projecting from one side of the base, said base having a flange on its opposite surface surrounded by an annular depression and projecting in a direction parallel with the axis of the tube and concentrically with and surrounding said tube, said tube and base being joined in a metal joint comprising the free edges of the flange and tube united in a homogeneous or integral whole, the metal of which is located below the face of the base plate opposite that from which the tube projects.

4. Composite metal work comprising a perforated base provided with an annular flange on one of its sides surrounding said perforation and a tubular stem provided with an annular shoulder and projecting from the opposite side of said base, said base and tube being fastened together by engagement of said annular shoulder with one side of the base and on the other side of the base by an enlarged mass of metal comprising metal of the end of the tube and the edge of the annular flange consolidated in a homogeneous or integral whole.

5. Composite metal work comprising a perforated base having on one side an annular depression surrounded by a flange bounding the perforation and a tube fitted within the flange and projecting from the opposite side of the base and engaging the base by a shoulder, said tube and base being united in a metal joint comprising metal of the edge of the flange and the edge of the tube consolidated in a homogeneous or integral whole, the metal of said joint being partially received in the annular depression so that there will be no projecting metal beyond the surface of the base where the joint is located.

Signed at New York, in the county of New York and State of New York this 7th day of February A. D. 1918.

LAURENCE S. LACHMAN.

Witnesses:
F. B. TOWNSEND,
IRENE LEFKOWITZ.