

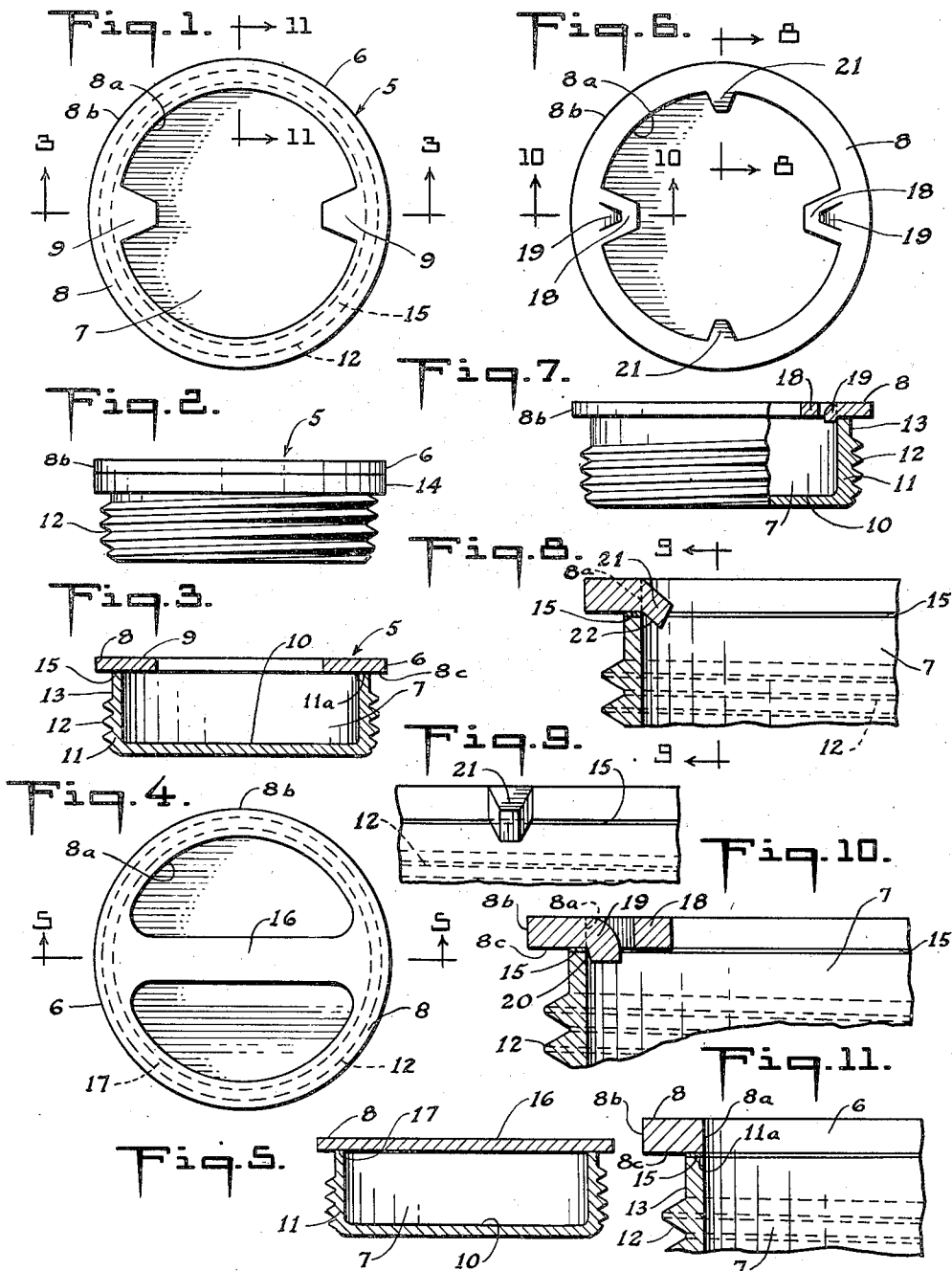
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METHOD OF MAKING CLOSURE PLUGS

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METHOD OF MAKING CLOSURE PLUGS

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1

This invention relates to closure plugs for containers, particularly heavy containers such as steel barrels and drums and to methods for making such plugs.

Closure plugs for steel barrels and drums presently in use are of two general types. One, which is the older and less effective, has a head which extends a substantial distance laterally and is designed to compress a wide thick gasket against a flat seat. Some of these are made of cast iron while others, not quite so numerous, are pressed from sheet metal and, so long as no particular refinements are required, can be made of a single piece of such metal.

The other type, commonly referred to as the "flush" type, receivable in special fittings having a tapered gasket engaging seat at the mouth thereof, has become more prominent of late and is highly effective. They, however, incorporate a number of accurate refinements in a much smaller element. They are thus difficult to produce out of one piece of metal unless they are formed by die casting. Efforts to make "flush" type plugs out of cast iron have been unavailing, due to the weakness and other undesirable characteristics of that material.

The other manner employed in the past for making such plugs has been to press or stamp parts therefor out of sheet metal. After such parts are machined and finished they have to be secured together. A number of the operations performed are expensive ones. Also, the materials employed had to be of good quality with the result that the finished products were more comparable to a precision part than to the type of production item one would expect to find as a drum closure plug. A need has accordingly long been felt to simplify the manufacture of drum closure plugs from sheet metal and it is believed that the plug, and method of making the same, of the instant invention meet that need.

The invention concerns a sheet metal plug and the making of the same in two pieces, in a simple and inexpensive manner. First a head part is formed which, besides furnishing a head for the plug also furnishes one of the elements of the gasket seat and carries the part or parts with which an actuating element is engaged for actuating the plug. Nevertheless this head can be made as a simple stamping and be completely finished in one operation.

The body portion of the plug is likewise formed in a simple manner, since a number of the elements of a complete plug previously carried by the body portion, are now furnished by the head

2

portion. The securing of the head to the body is simply done by a simple welding or brazing process which can be quickly and easily performed. Nevertheless the finished plug has all the essential characteristics to make it fully effective, while the same are provided with less effort than was heretofore the case.

It is accordingly an object of this invention to provide a two piece closure plug which is simple in construction and can be produced with a minimum of effort.

It is another object of the invention to provide a method for making such a plug.

Still another object of the invention is to provide such a plug which may be made of relatively low grade material and the parts of which may be secured together in a very simple fashion.

Other and further objects of the invention will in part be obvious and will in part appear as this description progresses and by reference to the accompanying drawing in which:

Fig. 1 is a top plan view of one form of the plug made in accordance with the invention.

Fig. 2 is an elevation thereof.

Fig. 3 is a cross-section in elevation taken on lines 3—3 of Fig. 1.

Fig. 4 is a top plan view of a slightly modified form of the plug of Fig. 1.

Fig. 5 is a cross-section taken on lines 5—5 of Fig. 4.

Fig. 6 is a plan view of a further modification of the plug of Fig. 1.

Fig. 7 is an elevation, partly in section, of the plug of Fig. 6.

Fig. 8 is an enlarged section of a fragment of the plug taken on lines 8—8 of Fig. 6.

Fig. 9 is an enlarged fragment in elevation of the plug of Fig. 6 taken at a 90 degree angle with respect to the showing in Fig. 8.

Fig. 10 is an enlarged fragmentary section taken on lines 10—10 of Fig. 6.

Fig. 11 is an enlarged fragmentary section taken on lines 11—11 of Fig. 1 showing the manner in which the parts of the plugs are secured together.

In Figs. 1, 2, 3 and 11 a plug, generally shown at 5 is shown as having a head portion 6 and a body portion 7 originally formed as separate pieces but here indicated as secured together. The head portion is generally in the form of a ring or annulus 8, with tapered inwardly extending lugs 9 extending inwardly thereof at opposite ends of a diameter. This portion can be simply and accurately made as a simple stamping whose inner edge 8a corresponds in diameter with the interior wall of the body portion 7. The diameter

of its periphery 8b is greater than the diameter of the body 7. The plug 7 for reasons that will appear hereinafter.

The body portion 7 has a bottom wall 10 with a side wall 11 therearound, the bottom part of which is screw threaded as shown at 12. Above the threaded portion 12 the side wall 11 is inset at 13 to form the inner wall of a gasket seat. The body portion 7 is first pressed into cup form and, when formed with the threads 12 and the inset 13, is complete except for making sure that the upper free edge 11a is true and in a plane at right angles to the axis of the threads 12.

The head portion 6 and the body portion 7 are now ready for securing together. This is accomplished by accurately aligning them so that the inner surface 8a, of the head, and the inner surface of the wall 11 extend from one to the other without interruption. The portions are then brazed or welded together throughout a zone 15, common to both portions. This zone of joinder is a complete annulus forming a leak-proof joint of the width of the wall portion 11 at its inset part 13.

The securing of the head 6 onto the body 7 completes the plug in a simple but adequate manner. Not only is the plug equipped with a necessary head, but at the same time it has lugs 9 with which to actuate it and the boundary of its gasket seat is completed. That seat is bounded at its inner face by the surface 13, at its lower side by the uppermost of the threads 12 and at its upper side by the under face 8c of the outwardly extending portion of the annulus 8. This seat is equipped with a gasket 14 (Fig. 2) to engage with a gasket seat on the bushing into which the plug is inserted. Gaskets of this type are designed to be engaged with tapered gasket seats on the bushings and hence are confined in all directions. It is thus important that the head 6 be secured to the body in a plane at right angles to the axis of the threads 12 so that the gasket is compressed evenly throughout its circumference as the plug is tightened. It is also of importance to have the peripheral surface 8b of the annulus 8 concentric or symmetrical with respect to the threads 12 and the inset surface 13. Thus the surface 8b, which is designed to engage the gasket seat on the bushing and act as a stop against undue compression of the gasket 14, will come into contact with the bushing seat all the way around its circumference and not at one point before another. All of these important features are provided in the instant construction even though the same be formed by simple operations.

In the Fig. 11 showing, the joining of the parts 6 and 7 by a metal, different from that of which they are made, is shown. This joint is a brazed one employing one of the common brazing materials. To facilitate the joining operation this material would be supplied in a complete ring of the same width as the thickness of the body portion of the plug at the part 13. Hence the holding of the parts and of the brazing material during the securing would be a simple matter. In addition to the brazing ring a suitable flux would be employed in accordance with well known brazing practice. Then when the parts to be joined are properly heated, a strong union between the head and body is provided, which union is also a leakproof joint. If the brazing is done properly no cleaning up or finishing of the gasket seat surfaces would be

necessary, though such finishing, if desired, could be accomplished in a very simple manner.

The modification shown in Figs. 4 and 5 is generally similar to the form of Figs. 1, 2 and 3, so that the same reference characters are applied to the common parts and the description of them need not be repeated. Instead, however, of providing lugs 9 for engagement by a suitable wrench, the plug of Fig. 4 is provided with a complete bar 16 across the interior diameter of the head 6. Here however, the joining of the head and body is shown as being accomplished by welding instead of brazing. This is indicated by the absence of brazing metal at the zone of joinder 17. A weld of this type can be readily made in accordance with modern practices by causing the body portion 7 of the plug to act as one electrode and by engaging the upper surface of the annulus 8 by the other electrode. The latter would have an annular work engaging face coinciding in dimensions with the free upper end of the wall 11. By interposing a ring of suitable welding rod between the parts to be joined and passing a suitable electric current therethrough, a smooth, effective joint can be made very quickly and simply.

While the forms of the invention shown in Figs. 1 and 4 would require the use of holding fixtures during the securing operation, to properly align and hold the head 6 and the body 7, the modification of Fig. 6 enables the securing to be carried out without the use of any such devices. In this form the body portion of the plug is the same as previously described so carries the same reference characters. The ring 8 is likewise the same. In place of the lugs 9 however, the ring 8 is provided with a pair of lugs 18 having tapered locating fingers struck from them, as shown at 19. The fingers 19, as shown, are turned downwardly from the plane of the lugs 18 as best shown in Fig. 10. This downward turning of the lugs 19 is accurately accomplished so that their outer surfaces 20 (Fig. 10), where they depart from the body of the head, lie at the extremes of a diameter which is the same as the internal diameter of the plug body 7.

Another pair of locating fingers 21 is also formed from the inner face of the ring 8 and is turned downwardly, as shown in detail in Figs. 8 and 9. These fingers lie on a diameter of the head at right angles to the diameter passing through the centres of the lugs 18. Here again, the points on which the undersides 22 of the fingers 21, (Fig. 8), depart from the undersurface of the head 8 lie at the extremes of a diameter which is substantially the same as the interior diameter of the plug body 7. This plug head may accordingly be accurately located on the body to which it is to be secured solely by means of the locating fingers carried by it. The use of any additional equipment for such locating is rendered entirely unnecessary. Nevertheless, no additional operations are required since the fingers 19 and 21 can all be formed and turned downward by a simple continuance of the die operation employed in forming the head portion 6.

The actual brazing or welding of the head and body, to secure them together, in the form of Fig. 6 is the same as is described with respect to Figs. 1 and 4. The only additional feature to note is that by holding the parts in the upside down position while securing them together, the locating fingers 19 and 21 will not only serve to locate the body portion of the plug with respect to its head, but will also serve to properly locate any

5

ring of brazing material or welding rod which might be used. By, in effect, providing a construction which incorporates its own fixtures, this form of the invention further reduces the expense of production required without reducing the excellence of the product.

It is believed that the foregoing description teaches how to simplify plug production without sacrificing quality of product. It is also believed that changes and modifications could be made in the above teaching without departing from the scope of the invention. It is accordingly intended that the description and drawing are to be interpreted merely as illustrative of the invention and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

The method of making a closure plug for containers, comprising forming a cup shaped body portion having a cylindrical side wall with a free end in a plane at right angles to the axis of said side wall, stamping an annular head portion out of sheet material having an internal diameter the same as the internal diameter of said cylindrical side wall and an external diameter greater than the external diameter of said side wall and with locating lugs extending downwardly from the in-

6

side face of said head portion, registering said head and body portions, by means of said locating lugs, with their internal surfaces in alignment and securing the same together by means of an annular leak-proof joint common to the free end of said side wall and the underside of said head portion.

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