March 20, 1928. 1,663,191

H. G. CARLSON

METHOD OF MAKING VALVE LIFTERS

Filed March 15, 1922

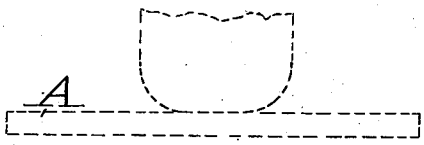


Fig. 2.

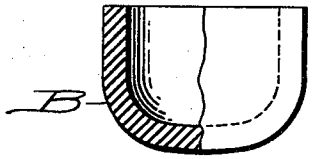


Fig. 1

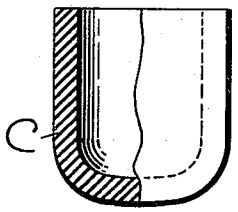
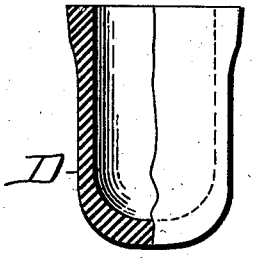


Fig. 3.



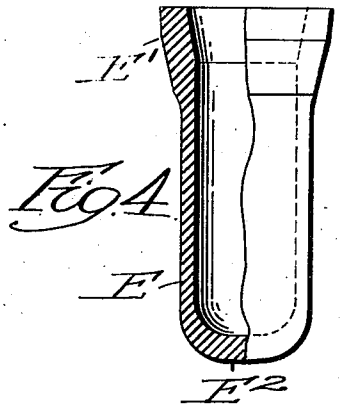
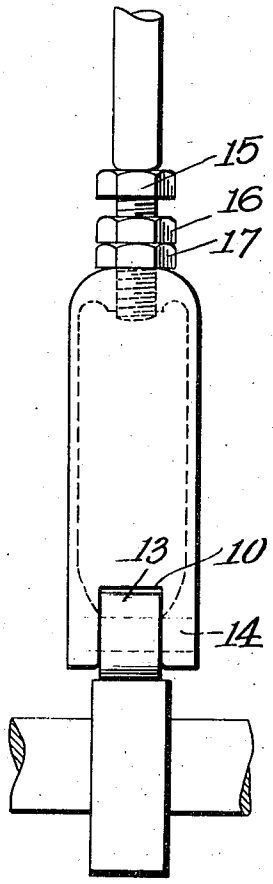


Fig. 4.



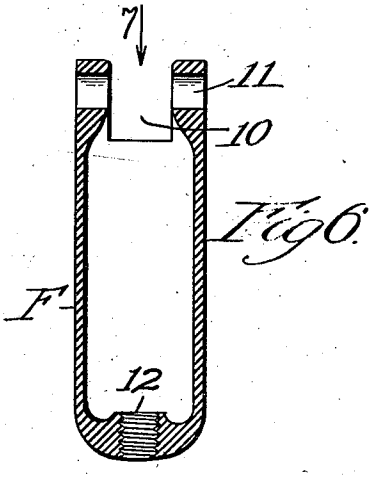


Fig. 6.

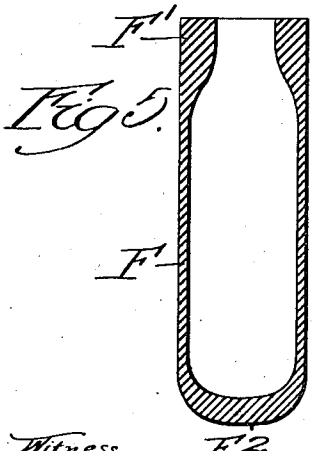


Fig. 5.

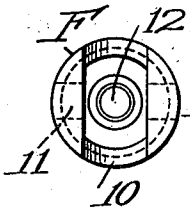


Fig. 7.

Fig. 8.

Witness
C. F. Nixon

Inventor
Hjalmar G. Carlson
By Attorneys
Southgate & Southgate

Patented Mar. 20, 1928.

1,663,191

UNITED STATES PATENT OFFICE.

HJALMAR G. CARLSON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO ROCKWOOD SPRINKLER COMPANY OF MASSACHUSETTS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

METHOD OF MAKING VALVE LIFTERS.

Application filed March 15, 1922. Serial No. 543,952.

The object of this invention is to provide a new and improved valve lifter. The valve lifter to which the invention is directed is the plunger interposed between the cam and valve of an automobile or hydro-carbon motor. This plunger is usually provided with a roller which is engaged by the cam and also with an adjusting screw which engages the lower end of the valve stem. These valve lifters are now usually made in one of two ways. In the first way, a solid piece of stock is taken and cut and machined to obtain the desired shape. This method is expensive and makes a lifter which is comparatively heavy. The second way these lifters are now made is to take a piece of tubular stock and insert bushings in the ends thereof to form reinforcements, the blank thus made being thereafter cut and machined to make the lifter. While this makes a lighter lifter, the method employed is expensive and the lifter being made of separate parts is apt to come to pieces under the continued reciprocation and jar in use.

I have discovered that an improved valve lifter can be made by drawing a cup or tube closed at one end from flat stock in such a manner that the body portion of the blank thus formed will be as thin as desired but so that the stock near the open end of the blank will be much thicker than the body portion and so that the bottom or closed end of the blank also will be thicker than the body portion. The thicker stock around the open end of the blank is then pressed inwardly, to form a blank or tube having a uniform outside diameter, the stock near the open end thereof being thicker than the body portion thereof, and the bottom also being thicker than the body portion. Then the blank or tube is machined and ground to make the finished lifter. A valve lifter is thus provided which can be very cheaply manufactured, which is light and which being integral cannot come to pieces in use.

It also will be noticed that as the article is made from flat stock drawn or pressed into integral, tubular or cup-like form, the grain of the metal will extend continuously throughout the length thereof whereby it can be made very light and whereby the same will last a long time without wear, as it reciprocates axially in its cage or bearing.

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

Figs. 1, 2, 3, 4 and 5 are cross-sectional views showing the drawing steps employed;

Fig. 6 is a view similar to Fig. 5;

Fig. 7 is an end view showing the blank or tube machined, and

Fig. 8 is a view showing the lifter in operative position.

Referring to the drawing, and in detail, it will be seen that I first take a piece of flat stock A and draw the same by a suitable punch and die into a cup or tube B, as shown in Fig. 1. This cup B is then elongated by another drawing process to assume the shape shown at C in Fig. 2. This cup C is then subjected to a drawing and elongating process so that the side walls or body portion thereof will be reduced in thickness, as illustrated at D in Fig. 3. This drawing process is then again conducted with another set of dies to produce the shape shown at E in Fig. 4, that is, a tube or blank having thin stock along its body portion E, thicker stock E′ around the portion near the open end of the tube, and a bottom E^2 thicker than the body portion. The portion E′ is then pressed or crimped in to assume the shape shown at F′ in Fig. 5, or in other words, a tube or blank is produced having a body portion F of relatively thin stock, the stock F′ near the open end of the tube being thicker and the bottom F^2 of the blank also being thicker than the body portion, said tube being integral and having a uniform outside diameter. The blank thus formed then is machined to make up the completed article. This machining consists in cutting a slot 10 across the open end thereof, in drilling a transverse hole 11 through this thickened stock, in punching in a hole 12 in the closed end of the tube and in tapping or threading this hole. After these machine operations are performed, the lifter can be ground so as to have a uniform cylindrical diameter.

The lifter is used by placing a roller 13 in the groove or slot 10, which roller is held in place by a pin 14 driven into the hole 11 through said roller 13, and by threading a screw 15 into the hole 12, which screw is usually provided with lock nuts 16 and 17.

The lifter with these parts is placed in position so that the roller 13 will be engaged by the cam of the motor and so that the screw 15 will engage the lower end of the valve stem, as shown in Fig. 8. Thus, a light, strong, cheap lifter is provided for the purpose stated.

The details and the operations may be varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. The method of making a valve lifter which consists in drawing a tube or cup from flat stock, elongating the tube so that the body portion thereof will be thin and so that the stock near the open end thereof will be thick, and crimping or pressing in the stock near said open end so as to produce a blank in integral tubular form having a uniform outside diameter with the stock near the open end thicker than the body portion thereof.

2. The method of making a valve lifter which consists in drawing a tube or cup from flat stock, elongating the tube so as to provide thicker stock near the open end, and on the closed end portion relatively to the body portion thereof, and crimping or forcing inwardly the thicker stock around the open end to produce a blank having a uniform outside diameter.

3. The method of making a valve lifter which consists in drawing a tube or cup from flat stock, elongating the tube so that the body portion thereof will be thin and so that the stock near the open end thereof will be thick, and crimping or pressing in the stock near said open end so as to produce a blank in integral tubular form having a uniform outside diameter with the stock near the open end thicker than the body portion thereof, and then slotting and drilling the open end of this blank.

4. The method of making a valve lifter which consists in drawing a tube or cup from flat stock, elongating the tube so that the body portion thereof will be thin and so that the stock near the open end thereof will be thick, and crimping or pressing in the stock near said open end so as to produce a blank in integral tubular form having a uniform outside diameter with the stock near the open end thicker than the body portion thereof, and then slotting and drilling the open end of this blank and making and tapping a hole in the closed end thereof.

In testimony whereof I have hereunto affixed my signature.

HJALMAR G. CARLSON.