Jan. 29, 1957 J. L. EDELEN 2,779,612

SHAFT AND PLATE ASSEMBLY AND METHOD OF ASSEMBLING THE SAME

Filed Dec. 18, 1950

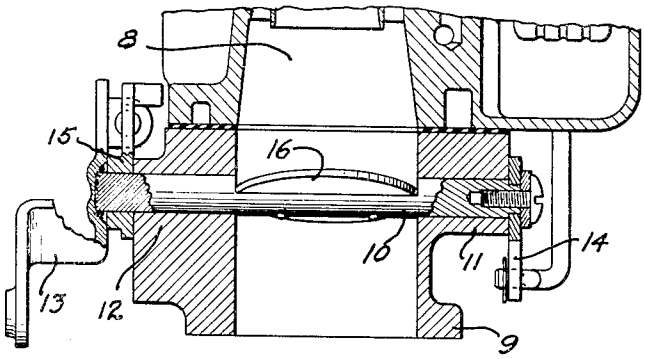


FIG. 1.

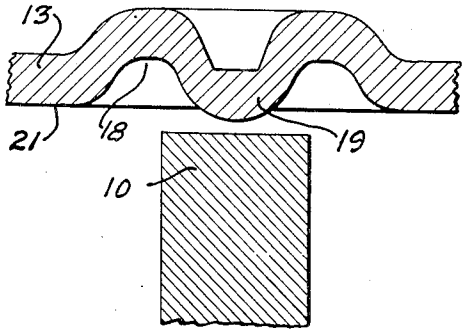


FIG. 2.

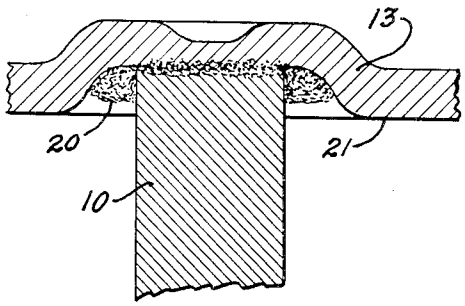


FIG. 3.

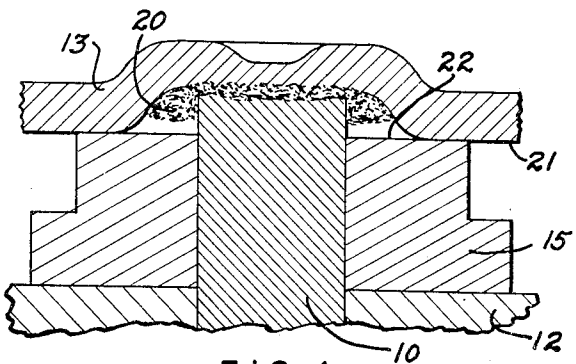


FIG. 4.

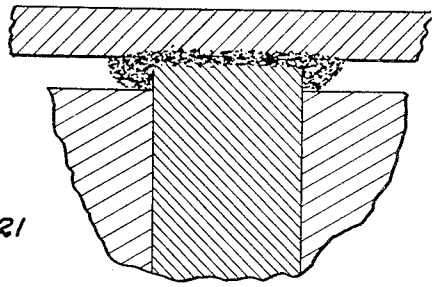


FIG. 5.

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SHAFT AND PLATE ASSEMBLY AND METHOD OF ASSEMBLING THE SAME

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1 Claim. (Cl. 287—20.2)

This invention relates to the assembly of a plate or lever with a rod or shaft and the method of assembling the same.

Welding of an operating lever to a journalled shaft has not been feasible, where the lever abuts the shaft bearing as a positioning or end play bearing factor, because of the interference of the flash material formed at the joint. An example of such a shaft and lever assembly occurs in an internal combustion engine carburetor in which the throttle valve shaft is journalled in the carburetor body and centered by means of the operating crank which is secured to one end of the shaft and abuts the exposed face of the shaft bearing.

The objects of the present invention are to provide a novel shaft and plate or lever assembly which permits the use of a butt welding method known in the art as projection welding and a novel method of effecting such assembly.

These objects and other more detailed objects hereafter appearing are attained by the structure illustrated in the accompanying drawing in which:

Fig. 1 is a vertical transverse section showing the lower portion of an internal combustion engine carburetor including a throttle valve, shaft, and operating lever embodying the invention.

Fig. 2 shows in enlarged section the abutting portions of the lever and shaft before uniting.

Fig. 3 is a similar view, but showing the lever and shaft after uniting by electric welding.

Fig. 4 is a similar view, but showing the united shaft and lever assembled with the shaft bearing.

Fig. 5 illustrates the interference of the welding flash in the assembly, but without resort to the teaching of the present invention.

The carburetor in Fig. 1 has a downdraft mixture conduit 8 flanged at the lower end, as at 9, for attachment to the engine intake manifold (not shown). A throttle shaft 10 has end journals rotatable in bearings 11 and 12 formed in the lower or throttle body portion of the carburetor. An operating lever or crank 13 is secured to the left-hand end of the throttle shaft and another arm 14 is secured to the right-hand end of the shaft. Interposed between crank 13 and the face of journal bearing 12 is a fast idle cam 15. Crank 14 and arm 13 and cam 15 cooperate with the respective bearing bosses to center the throttle shaft so that throttle plate 16 operates smoothly within the carburetor bore.

Throttle operating lever 13 is secured to the end of the throttle shaft by the method illustrated in Figs. 2–4 inclusive. The lever, initially, is formed with a depression or cavity 18 centrally outset to form a projection 19. The end of shaft 10 is then applied to projection 19, as

in Fig. 2, and the assembly electrically welded during which process projection 19 is reduced and the molten metal forms the weld, portions thereof being exuded sidewardly, as shown in Fig. 3, to form what is known as the flash 20. In the finished weld, the end of the shaft 10 rests on a seat flush with the bottom of lever depression 18.

The depression is substantially wider than the thickness or diameter of shaft 10 so as to permit such exuding of molten flash metal and also the escape of gases therefrom so that a perfect weld may be obtained. The depth of the depression is at least equal to or greater than the corresponding thickness of the welding flash. This results in the flash clearing the face 21 of the lever which bears against the opposing face 22 of cam 15 without interference from the flash. Figure 5 illustrates the interference of a welding flash if the novel depression were omitted from the lever.

The invention may be applied to the assembly of any shaft or rod, at its end, to a lever, arm, or plate and in the accompanying claim the terms "shaft" or "rod" refer to any such member corresponding in positioning to the shaft 10 and the term "plate" refers to a member such as the lever 13 secured to the end thereof. Of course, the cam 15 may be omitted and a washer substituted therefor or the operating lever may directly abut the end of the bearing boss.

The invention may be modified in these and other respects as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claim is contemplated.

I claim:

In combination, a body having an opening therein forming a bearing, a shaft journaled in said bearing, a member fixed on one end of said shaft to prevent its axial movement in one direction, and a member for welded attachment to the other end of said shaft outwardly of said body, said second member including a plate portion formed with an annular bead outwardly offset to provide a socket for receiving the end of the shaft, said socket being of greater diameter than the diameter of the adjacent shaft end received therein and having a smaller centrally positioned boss extending inwardly to approximately the plane of the inner surface of said plate for engaging the shaft end prior to welding, the outer surface of said boss and the inner face of said socket forming an open annular recess extending laterally beyond the periphery of the shaft, said boss being adapted to be dissipated and flattened during welding to said shaft, whereby the inner end of said shaft moves into the socket until the inner face of the plate about the socket engages said body to limit the axial movement of said shaft in the other direction, said socket about the end of said shaft forming a depository for exuding flash metal.

References Cited in the file of this patent

UNITED STATES PATENTS

1,142,241	Ellinger	June 8, 1915
1,252,142	Murray	Jan. 1, 1918
1,968,976	Van Halteren	Aug. 7, 1934
2,017,890	Bracke	Oct. 22, 1935
2,162,902	Adams	June 20, 1939
2,272,283	Widgren	Feb. 10, 1942
2,319,407	Knochel et al.	May 18, 1943
2,447,085	Odlum	Aug. 17, 1948