

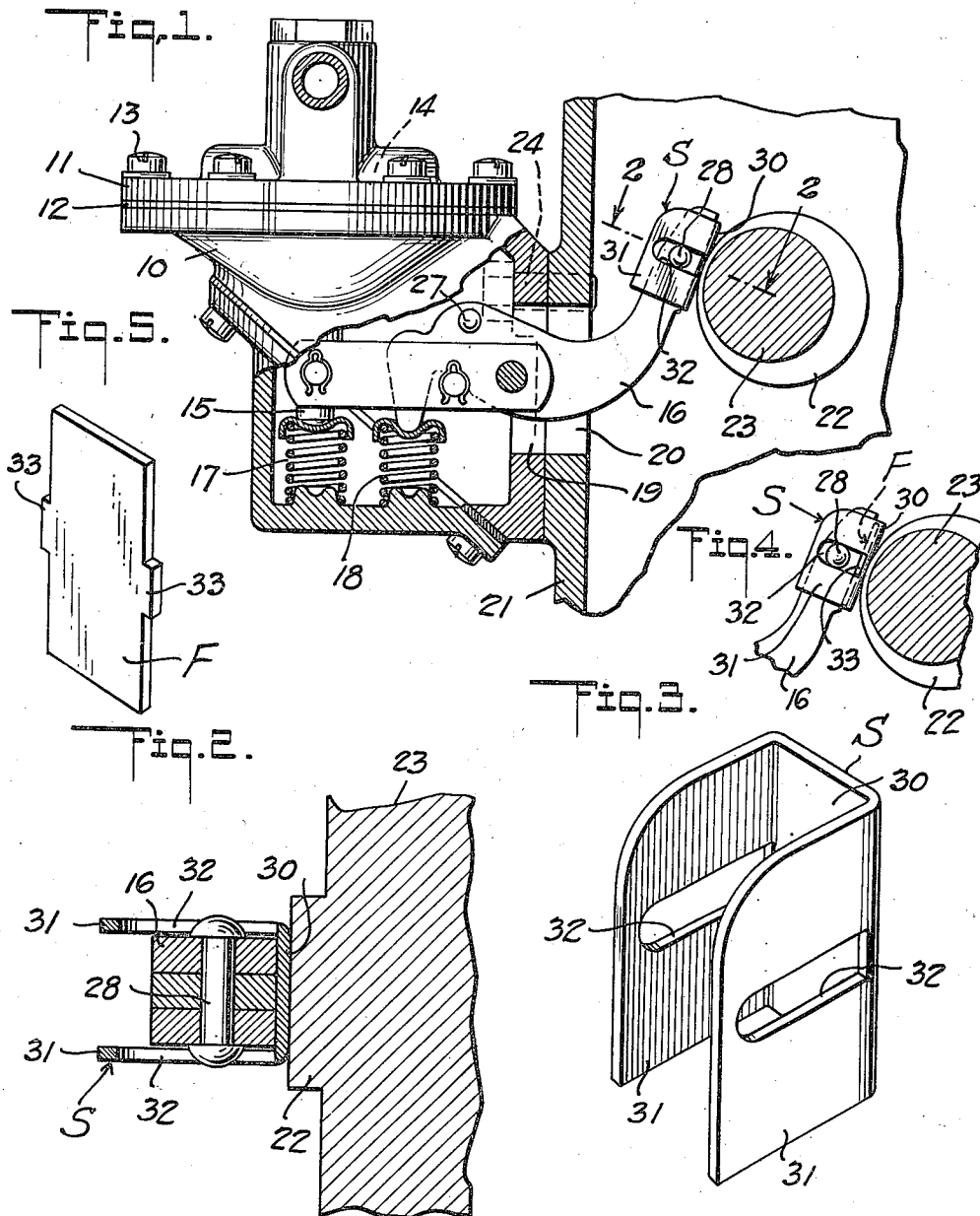
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SHIM

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SHIM

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This invention relates to machinery generally, and more particularly to means by which wear or inaccurate mountings of working parts can be compensated for, in order to restore such parts to their original or to increased dimensions or predetermined operating relationships, and thus prolong the useful life of the mechanism.

An object of this invention is to provide a shim particularly adapted, although not necessarily for use with a liquid fuel pump of the type installed on internal combustion engines, the shim being applicable to a cam operated actuating member of the pump in a manner to effectively compensate for wear on the actuating member and/or cam, as well as dimensional inaccuracies of the pump and its mounting on the engine, which individually or collectively result in such a decrease in pumping capacity of the pump that the latter is unable to supply the amount of fuel necessary for operation of the engine.

Another object of the invention is to provide a shim which can be applied to the actuating member of the fuel pump without altering the construction of the member; which can be applied without the use of tools, and requires no extraneous fastening means; and which is co-actable with a structural feature of the actuating member in a manner to be supported thereby in operative relation to the cam, as well as being self-adjusting in its applied position so as to accommodate itself to varying relationships between the actuating member and cam.

With these and other objects in view, the invention resides in the combinations, arrangements and functional relationships of elements as set forth in the following specification and pointed out in the appended claims.

In the accompanying drawing,

Figure 1 is a view in side elevation, and partly in section, of a fuel pump installation of an automobile engine, and illustrating a shim embodying this invention applied to the cam operated actuating member of the pump;

Figure 2 is a sectional view taken on the line 2-2 of Figure 1;

Figure 3 is a perspective view of the shim;

Figure 4 is a fragmentary view of a portion of Figure 1, showing a filler member used with the shim;

Figure 5 is a perspective view of the filler member.

It is a common occurrence in certain types and mountings of liquid fuel pumps as at present installed on automobile engines, for such pumps to be deficient in pumping capacity so as to be

incapable of delivering the requisite amount of fuel to the carburetor of the engine for operation of the latter under any and all conditions.

A type of fuel pump in which this deficiency has been found to exist in practice is illustrated in Figure 1 and is similar to that disclosed in U. S. Patent No. 1,905,207, issued to M. A. Babitch et al. This pump generally includes a body 10 co-acting with a head 11 and a flexible diaphragm 12 clamped therebetween by screws 13, to provide a pumping chamber 14.

A stem 15 is secured centrally to the diaphragm 12 and is actuated by a sectional lever 16 against the urging action of springs 17 and 18. A motion receiving section of the lever 16 projects through an opening 19 in the body 10 and through an opening 20 in the crankcase 21 of an engine, for wiping engagement with a cam 22 on the crankshaft 23 of the engine, all of which will be understood by those familiar with the art.

The body 10 is detachably secured to the crankcase 21 by screws 24 to form a sealed joint and prevent oil leakage from the crankcase through the opening 20.

The motion receiving section of the lever 16 is a laminated structure as shown in Figure 2, the laminations of which are secured together by headed pins, rivets or other fastening means as indicated at 27 and 28 in Figures 1 and 2.

The shim S embodying this invention is constructed of sheet metal such as spring brass or other suitable bearing material bent into substantially U-form to provide a bearing or wear receiving portion 30 and two spaced spring attaching portions 31 having aligned slots 32 there-through, all as clearly shown in Figure 3.

The spacing between the attaching portions 31, when in parallelism, is substantially equal to the thickness of the motion receiving section of the lever 16 at its point of engagement by the cam 22, and the slots 32 are of sufficient width to receive the heads of the rivet 28.

In the use of the invention on the lever 16 of a pump in which the mounting of the latter on the crankcase 21 is inaccurate to the extent of improperly presenting the lever to the cam 22 so that the latter cannot impart the predetermined stroke to the lever, or in which the lever is inaccurately related to the pump body, or the lever and/or the cam have become worn, all with a similar result, a shim S of a thickness to compensate for the dimensional inaccuracy is applied to the lever 16 by springing the attaching portions 31 over the heads of the rivet 28, when the pump is detached from the crankcase.

With the shim thus applied and the pump again attached to the crankcase as shown in Figure 1, the portion 30 of the shim will be interposed between the lever and the cam so that the latter can impart the increased movement to the lever necessary to restore the rated pumping capacity to the pump.

In order to obviate the need for stocking shims of various thicknesses to compensate for greater or lesser clearances to be taken up between the lever 16 and cam 22 in different pump installations, an inexpensive filler member F (Figures 4 and 5) can be provided for use in conjunction with the shim S, which latter can be of the minimum gage found necessary in practice to compensate for lost motion between the lever and cam.

The filler member can be provided in different gages, such as .025, .050, and .075 of an inch, and be constructed of brass, whereas the shim S can be constructed of spring tempered steel so that its wear receiving portion 30 affords maximum resistance to wear by the cam. The filler member is merely a rectangular stamping of a length and width enabling it to fit freely between the attaching portion 31 and against the confronting inside face of the portion 30 as shown in Figure 4. The filler member is provided with lugs 33 adapted to enter the slots 32 of the shim, so that in the installed position of the latter, the filler member will be positively confined against displacement from between the shim and the lever 16, and will co-act with the shim to add the necessary thickness thereto to compensate for whatever lost motion may exist between the lever and the cam.

What is claimed is:

1. A shim for a motion receiving member of a mechanism, comprising a wear receiving portion and spaced resilient attaching portions adapted to straddle the motion receiving member; the attaching portions having openings adapted to receive projections on the motion receiving member upon springing of said attaching portions over the projections, whereby to secure the shim to the member.

2. A shim comprising a U-shaped body defining a wear receiving portion; spaced attaching portions projecting from the wear receiving portion, and having openings adapted to receive projections on a member to detachably secure the shim thereto with said wear receiving portion thereof disposed for engagement by a second member.

3. In a fuel pump having an actuating member including a lever arm provided with oppositely disposed projections; a shim having a wear receiving portion and spaced attaching portions adapted to straddle the lever arm; and means adapted for co-action with the projections of the lever arm to detachably secure the shim thereto with said wear receiving portion disposed for wearing engagement with a second member.

4. In a fuel pump having an actuating member including a lever arm provided with oppositely disposed projections; a shim having a wear receiving portion and spring attaching portions spaced sufficiently to receive the lever arm therebetween; the attaching portions having slots adapted to receive the projections of the lever arm when the attaching portions are sprung over the projections, whereby to detachably secure the shim on the lever arm.

5. A shim comprising a U-shaped body defining a wear receiving portion; spaced attaching portions projecting from the wear receiving portion, and having openings adapted to receive projections on a member to detachably secure the shim thereto with said wear receiving portion thereof disposed for engagement by a second member; a filler member; and lugs on the filler member adapted to enter said openings to confine the filler member against displacement from between the wear receiving portion and the first said member.

6. A shim for a motion receiving member of a mechanism comprising: a wear receiving portion and spaced resilient attaching portions adapted to receive the motion receiving member therebetween; and means on the shim adapted for co-action with projections on the member to secure the shim thereto when said portions of the shim are sprung over the projections.

7. A shim for a motion receiving member of a mechanism comprising: a wear receiving portion and spaced resilient attaching portions adapted to receive the motion receiving member therebetween; means on the shim adapted for co-action with projections on the member to secure the shim thereto when said portions of the shim are sprung over the projections; a filler member; and means on the filler member co-actable with the shim to support the filler member between the wear-receiving portion of the shim and the motion receiving member.

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