Aug. 21, 1956 E. F. HEIMBUCH 2,759,466

VALVE STEM OIL DEFLECTOR MEANS

Filed Nov. 19, 1953

Fig. 1

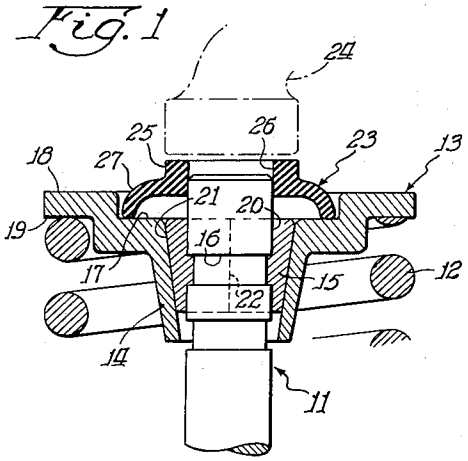


Fig. 2

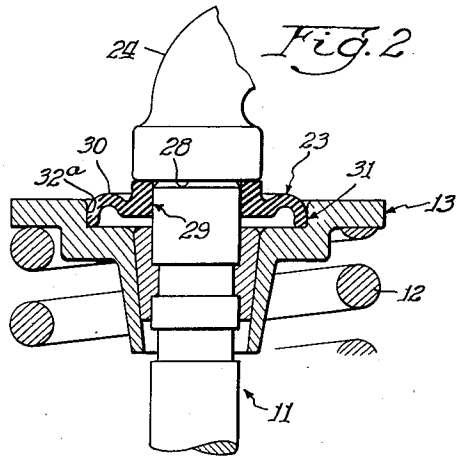


Fig. 3

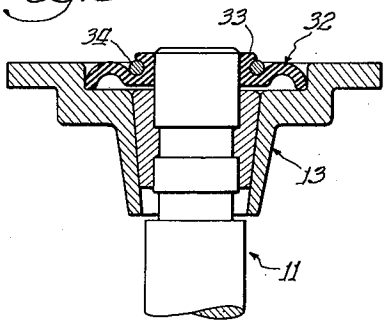


Fig. 4

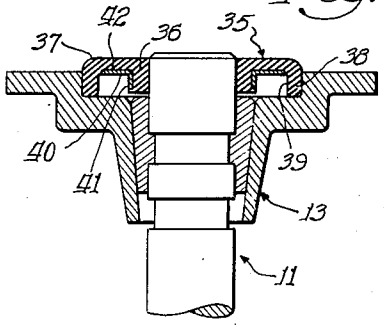


Fig. 5

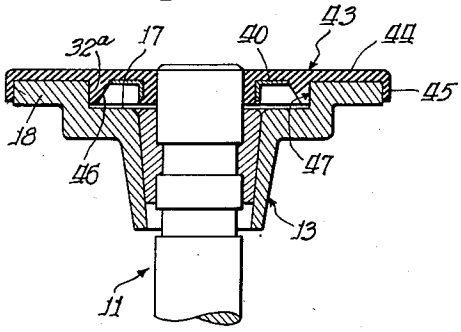
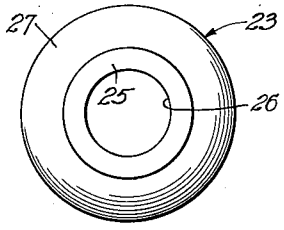


Fig. 6



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VALVE STEM OIL DEFLECTOR MEANS

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Application November 19, 1953, Serial No. 393,083

4 Claims. (Cl. 123—90)

This invention relates to valve stem oil deflector means, more particularly for over-head valves to prevent excess oil from running down the valve stem.

This application is a continuation in part of my prior co-pending application Serial No. 332,055, filed January 19, 1953, now abandoned.

The invention provides an improved and economical means for the purpose.

These and other objects and advantages will be apparent from the following description, taken together with the accompanying drawings, of illustrative embodiments of the invention and in which drawings—

Figure 1 is a fragmentary vertical sectional view of the valve stem and spring retainer parts, with an embodiment of the present invention associated therewith, the valve stem portion being shown in full lines and the valve rocker arm being indicated diagrammatically by broken lines;

Figure 2 is a view somewhat similar to Fig. 1 but showing the embodiment of the invention compressed by the rocker arm;

Figure 3 is a somewhat similar view of a slightly different embodiment of the invention;

Figure 4 shows a further modification;

Figure 5 shows a still further modification; and

Figure 6 is a plan view of the deflector member of Figs. 1 and 2.

Referring in detail to the illustrative embodiment of the invention shown in Figs. 1, 2 and 6, the numeral **11** may indicate the usual valve stem of an overhead valve for an internal combustion engine with which is associated the usual valve spring **12** abutted at its upper end against a spring retainer cup **13** of annular formation held to the upper end of the valve stem **11** by having its hollow body portion **14** downwardly and inwardly tapered to wedge against split key **15** which interlocks with the annular groove **16** on the valve stem. The spring retainer **13** is conventionally of cup formation by its hollow body and by being centrally dished at its upper end as at **17** about the valve stem **11** and the retainer has extending radially from the dished portion an annular rim or flange **18**, the construction just described providing a lodgment **19** for the upper end of the valve spring **12** which not only limits movement of the spring but centers it about the valve stem. Oil used for lubrication of the overhead valve mechanism tends to accumulate in undesirable excess quantities on the valve stem **11**. In particular, such oil tends to be collected by the dish portion **17** of the spring retainer **13** and to form a pool of oil therein which tends to run down the walls **20** of the valve stem and **21** of the retainer key **15** as well as through the joint or interface **22** between the two halves of the split key **15**.

In accordance with the present invention, and turning first to Figs. 1, 2 and 6, I provide an umbella-like deflector member **23** of elastomeric material, such as rubber or preferably one of the rubber-like synthetic materials having a desirable resistance to deterioration under the influence of heat and oil, mounted on the stem upper end.

As suggested in Fig. 1, by manually depressing the valve stem, i. e. opening the valve against the action of the spring **12** so as to momentarily move the valve stem away from the rocker arm **24**, as in open position of the valve, sufficient space is created between the upper end of the valve stem and the rocker arm to enable the umbrella-like member **23** to be inserted on top of the valve stem. The member **23** has an upper relatively thick transverse portion **25** which is centrally and circularly perforated as at **26** to fit snugly on the cylindrical valve stem. From the transverse portion **25** the member **23** is outwardly and downwardly annularly belled as at **27** to provide the umbrella-like formation already referred to of relatively thinner cross-section.

When now, the member **23** having been thus located in position on the upper end of the valve stem, the valve is released, the spring **12** moves the valve stem upwardly to closed position of the valve until first the member **23** and then the upper end of the valve stem is brought into an engagement with the lower face of the valve rocker arm **24** (Fig. 2). Thereupon, and particularly thereafter by repeated action of the rocker arm on the valve stem during periodic opening movements of the valve, the member **23** is moved to the position on the valve stem shown at **28** in Fig. 2, in which the member is tightly pressed onto the valve stem to effect an oil seal as indicated by the arrow **29** at the annular face **20** of the valve stem. At the same time, the belled portion **27** of the member **23** is deflected as at **30** and compressed into the dished depression **17** in the spring retainer **13** to provide an oil seal as indicated by the arrow **31** between the vertical wall **32** or shoulder **32***a* of the dished depression **17** and the member **23**.

So constructed and arranged the member **23** prevents the accumulation of oil in the dished depression **17** and guards against the passage of oil between the valve stem and the retainer keys and between the latter and the spring retainer. At the same time some oil, which is particularly desirable in the form of fine spray or mist, is permitted to be deposited on the valve stem below the spring retainer to lubricate the valve stem in the valve guide (not shown).

If it be desired to further load a member such as **23** onto the valve stem it may be constructed as shown at **32** (Fig. 3), in which the transverse portion **33** thereof has encircling it a wire snap ring **34**. By this means the member **32** may be held tightly on the valve stem without the reliance upon the pressure of the rocker arm **24**.

Figure 4 shows a modification in which the elastomeric member **35** while still umbrella-like is of flatter formation, embodying the central transverse cylindrical portion **36** and a right angular portion **37** extending radially and axially therefrom having a down-turned peripheral edge **38**. In the annular groove **39** thus provided on the underface of the member **35** is located a metal loading ring **40** also of angular formation in cross-section, having one axially extending portion **41** which surrounds the transverse portion **36** of the member and another radially extending portion **42** that abuts the radially extending portion of the angular portion **37** of the member **35**.

In the still further modified form shown in Fig. 5, the elastomeric member **43** is radially extended as at **44** to cover the entire retainer including the flange **18** and has a downturned peripheral edge **45** that seals on the outside periphery of the retainer. The member **43** may carry a loading ring **40**. In addition to such peripheral seal, the member **43** has the intermediate annular bead **46** which seals as at **47** on the wall **32***a* of the dished depression **17** of the retainer **13**, similarly to the sealing action at this point of the other forms of resilient members **23**, **32** and **35**. The intermediate annular bead **46** is advantageously wedge-shape in cross-section and is pressed into

the depression 17, having a vertical surface which closely laps the depression surface 32*a*.

In each form, the elastomeric member is of umbrella-like shape and is of sufficient diameter to cover at least the dished depression 17 of the spring retainer cup and deflects the oil away from the interfaces between the spring retainer and the valve stem, sealing on the valve stem and also having a laterally extended annular portion sealing on the shoulder 32*a*.

Such changes may be made as fall within the scope of the appended claims without departing from the invention.

What is here claimed is:

1. In valve stem oil deflector means for overhead valves, the combination with a valve stem having a spring retainer thereon of cup formation having a hollow body and a dished depression at its upper end, said depression being defined by a vertical annular wall on said retainer spaced from said stem, of an umbrella-like member of elastomeric material on said stem on top of said retainer, said member having an annular thickened portion having a circular opening passing the stem snugly therethrough in oil sealing relationship with the stem and having an annular laterally extended portion engaging said shoulder in oil sealing relationship therewith, whereby to prevent oil

from running down between the stem and said retainer.

2. The structure of claim 1 wherein there is an annular metallic reinforcement carried by said umbrella-like member spaced from said opening.

3. The structure of claim 2 wherein the umbrella-like member is radially and annularly extended to cover the entire top of said retainer.

4. In valve stem oil deflector means for overhead valves, a deflector member of elastomeric material for mounting on said valve stem, said member having a relatively thick transverse portion and an umbrella-like depending skirt portion, said transverse portion having a central opening for snugly but slidably receiving the valve stem therethrough, said skirt portion being of relatively thinner cross-section than said transverse portion, and an annular metallic reinforcement carried by said member spaced from said opening.

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