July 8, 1958 G. M. BRAUN 2,842,111

VALVE SILENCERS

Filed Nov. 13, 1956

Fig. 1

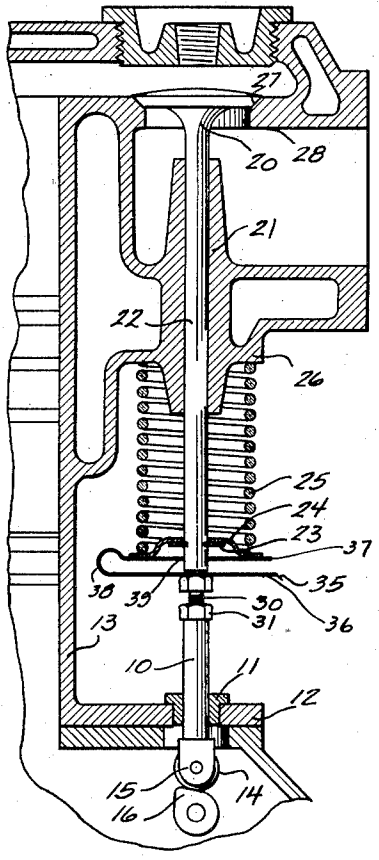
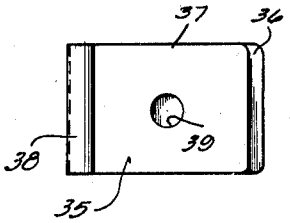


Fig. 2



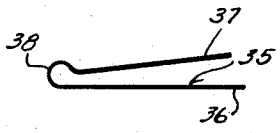


Fig. 3

INVENTOR.
GEORGE M. BRAUN
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

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VALVE SILENCERS

George M. Braun, Milwaukee, Wis.

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2 Claims. (Cl. 123—188)

My invention relates to improvements in valve silencers.

The object of my invention is to provide a valve silencer for poppet valve actuation such as is found in modern internal combustion engines and other poppet valve equipped machinery.

My device is located between the end of the valve stem and the cam follower, and an important feature of my invention is the provision of a simple silencing spring device formed in one piece and so shaped as to be positively located for its operation and to provide the simplest and most trouble free element to take the impact of valve actuation.

In the drawings:

Fig. 1 is a vertical section through that fragmentary portion of an internal combustion engine which shows a poppet valve and its environment, my valve silencer being shown in position between the poppet valve and its spring, and the cam follower.

Fig. 2 is a top plan view of my valve silencer.

Fig. 3 is a side elevation of the silencer shown in Fig. 2.

I am aware that spring elements have heretofore been provided for location between a cam follower and the valve stem which the cam follower is intended to actuate. Such a silencer is shown in U. S. Patent No. 1,395,064 to C. D. Stromgren, October 25, 1921, but it will be seen from the following description that my device is greatly simplified and is much more effective for longer periods of time without service requirement.

As shown in the drawings, the environment in which my silencer is used includes the usual cam follower **10** mounted in a guide **11** carried by flange **12** of cylinder **13** of an internal combustion engine. As shown somewhat diagrammatically, the lower end of the cam follower is provided with a roller **14** mounted in a roller bracket **15** secured to the lower end of the follower **10**. The roller **14** is thus positioned to be actuated by a cam **16** in the well known manner as the cam follower is reciprocated upwardly and downwardly in response to cam action. Valve **20** is guided by valve guide **21** in which valve stem **22** is mounted to reciprocate upwardly and downwardly in response to cam follower reciprocation. At the lower end of the valve stem **22** is a key **23** which may be made in any one of the many acceptable shapes, but which is usually horseshoe shaped and receivable into a groove in the stem so as to provide a stop against which a somewhat cup shaped spring seat **24** may rest under the bias of valve spring **25**. This spring **25** is a compression spring bearing at its lower end against the cup shaped spring seat **24** and at its upper end against the lower surface **26** of what is, in this particularly disclosure, an L head engine. Thus the valve stem **22** is constantly urged to its lower position whereby to firmly seat the valve **20** against a valve seat **27** which surrounds a port **28**.

As is customary in valve actuating mechanisms of this general type, the cam follower **10** is provided with an axially aligned adjusting screw **30**, which is usually in the form of a cap screw, in threaded engagement with the cam follower **10** and the usual lock nut at **31** is provided. Conventionally, the top of the cap screw **30** is in position to bear upon the unprotected valve stem **22**

and as is customary in the adjustment of these valves some clearance is provided between the top of the cap screw and the end of the stem to permit of some tolerance for expansion and contraction of the metals during heating and cooling of the engine.

It is into the environment above described and particularly between the cap screw **30** at the end of the cam follower **10** and beneath the cupped spring seat washer **24** that my valve silencing device **35** is installed. My device **35** is made of a sheet or strip of spring metal. I shape this in a folding operation so that my silencer includes a lower plate **36** and an upper plate **37** joined by a somewhat cylindrical spring margin **38**. The lower plate **36** is imperforate and the upper plate **37** is provided approximately centrally with an aperture **39** through which valve stem **22** is snugly receivable.

The area of the upper plate **37** is sufficient so that the spring seat washer **24** may bear flatly against it when my device is in working position as shown in Fig. 1. When my silencer is removed from its working position, it takes the position shown in Fig. 3.

The strength of the spring action provided by the device **35** is ample to force cam follower **10** downwardly upon the cam **16** throughout the entire working cycle of cam **16** at all speeds of the engine, but, of course, the strength of the spring action of my device is nowhere near adequate to compress valve spring **25**. It is merely a booster for the return of cam follower **10** in this respect.

It will be noted that when in working position, my device is so disposed that the valve stem extends through aperture **39** and closely approximates contact with the upper surface of plate **36**; therefore, there is no material other than plate **36** between the top of the cap screw **30** and the lower surface at the end of valve stem **22**.

It will thus be apparent that my valve silencer is of the greatest simplicity of construction, that it cannot be accidentally mislocated with respect to its work environment and it in no sense complicates the adjustment of cap screw **30** and the clearance relationship which must be maintained in the valve action. The clearance is definitely provided between the valve stem and the upper surface of plate **36**.

I claim:

1. A device of the character described comprising a flat sheet area of spring material shaped intermediately to provide a partially cylindrical spring fold and having areas either side of the fold divergent from each other when in spring relaxed position, one of said areas being apertured centrally, the other of said areas opposite said aperture being imperforate.

2. A device of the character described for interposition between a cam follower assembly and a valve stem having a cupped valve spring seat secured adjacent the end of the valve spring, said silencer comprising an imperforate plate to bear in flat contact against the cam follower assembly, integral semi-cylindrical spring margin for said imperforate plate and connected integrally with an upper plate centrally apertured for snug reception of the end of the valve stem and sufficient area to provide full abutment against said spring seat.

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