Dec. 2, 1952

J. E. MICHELICH

2,619,946

VALVE SILENCER

Filed May 13, 1948

Fig. 1.

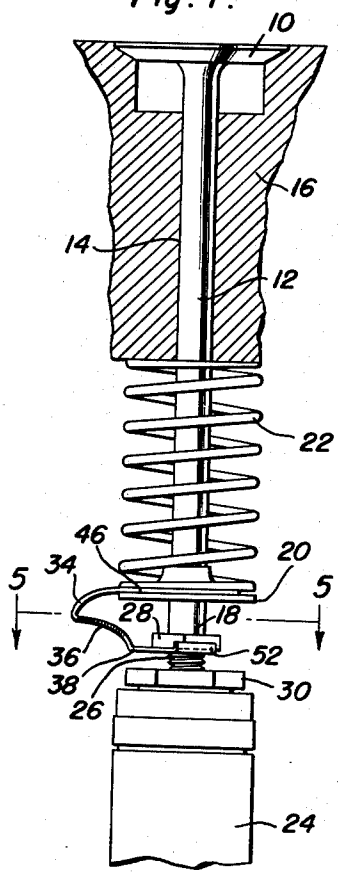


Fig. 2.

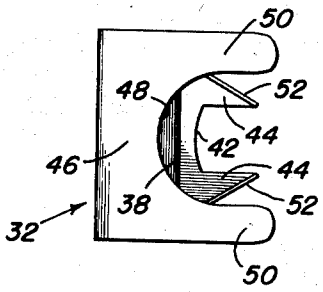


Fig. 3.

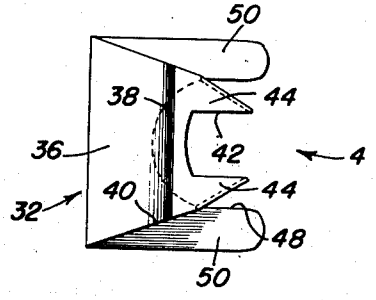


Fig. 4

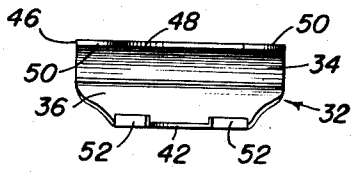
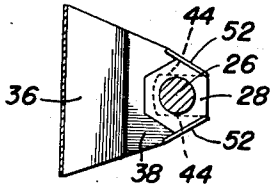


Fig. 5.



John E. Michelich

INVENTOR.

BY Thomas A. O'Brien and Harvey B. Jacobson

Attorneys

Patented Dec. 2, 1952

2,619,946

UNITED STATES PATENT OFFICE

2,619,946

VALVE SILENCER

John E. Michelich, Auburn, Ill.

Application May 13, 1948, Serial No. 26,849

7 Claims. (Cl. 123—90)

1

This invention relates to new and useful improvements in valve silencers and the primary object of the present invention is to provide an attachment for poppet type valves that will reduce and eliminate the normally metallic sound prevalent during the engagement of a valve stem with the head portion of a tappet.

Another important object of the present invention is to provide a valve silencer including a resilient connection between a valve stem and tappet that will remove the valve clearance from the base of the valve and place it between the base of the tappet assembly and the cam lifter on the cam shaft, thus eliminating undesirable noise, since, at this latest position, there is a surplus of oil direct from the crankcase of the engine.

A further object of the present invention is to provide a valve silencer that is extremely small and compact in structure and which is quickly and readily applied to or removed from its operative position in a convenient manner.

A still further aim of the present invention is to provide a valve silencer that is simple and practical in construction, strong and reliable in use, efficient and reliable in operation, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary elevational view partly in section showing a poppet type valve and tappet assembly, and showing the present invention applied thereto;

Figure 2 is a top plan view of the present valve silencer;

Figure 3 is a bottom plan view of the present valve silencer;

Figure 4 is an end view of the present invention taken substantially in the direction of arrow numbered 4 in Figure 3; and

Figure 5 is a horizontal sectional view taken substantially on the plane of section line 5—5 of Figure 1.

Referring now to the drawings in detail, wherein, for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a poppet valve having a stem portion 12 that is slidably mounted in a guide opening 14 provided in an engine 16. Fixed on the valve stem 12 adjacent

2

the lower terminal 18 thereof is a retainer or washer 20 that engages one end of a coil spring 22. The spring 22 embraces the valve stem 12 and is biased between the engine 16 and the washer 20 to urge the valve stem 12 to a lowered position.

The numeral 24 represents a push rod or tappet assembly that receivably engages a tappet 26 having a head portion 28 which is adjustable relative to the terminal 18 of the valve stem 12. A lock nut 30 is engaged on the tappet 26 for retaining the tappet in a selected adjusted position.

As is usual for the above conventional structure, the push rod 24 is actuated by the cam (not shown) of a cam shaft (not shown), whereupon the tappet and push rod are reciprocated and the tappet engages the valve stem to actuate and impart a reciprocable motion to the valve 10.

Due to the lack of a proper amount of lubricant between the terminal 18 of the valve stem 12 and the tappet head 28, there exists a noise as the tappet engages the valve stem. It is, therefore, the primary features of the present invention to remove the valve clearance from the base of the valve or terminal 18 and place it between the base of the push rod 24 and the cam lifter (not shown) on the cam shaft (not shown). Clearance is obtained at this latest referred to position, since there is a surplus of lubricant direct from the crankcase of the motor.

To accomplish the above desired results, there is provided a substantially U shaped clip or member 32 of resilient material such as spring steel. A portion of the web 34 for said member 32 is pressed inwardly to provide a recess or detent 36 that communicates with the lower leg 38 of member 32. This lower leg 38 is provided with outwardly converging edges 40. The outer end of the leg 38 is centrally notched as at 42 to provide a pair of bearing tips 44.

The upper leg 46 of the member 32 is provided with an arcuate notch 48 to form a pair of bearing tips 50.

In practical use of the present valve silencer, the notch 42 engages the tappet 26 and the tips 44 bear against the lower face of the tappet head 28, and the notch 48 receives the valve stem 12 with the tips 50 bearing upon the upper face of the washer 20 and disposed between the washer 20 and coil spring 22.

The side edges of the lower tips 44 are turned upwardly to provide bearing flanges 52 that engage a pair of the sides of the tappet head 28 to prevent relative rotation between the head 28 and clip 32.

It is noted that the recess or arcuate portion

36 will urge the tappet head 28 upwardly into engagement with the terminal 18 of the valve stem 12.

Before the present valve silencer 32 is applied to its operative position, the proper specified clearance must be made with a feeler gauge in the usual manner and by usual methods. Then when the silencer is in place, the lips or flanges 52 will lock themselves to the tappet head 28, thus pulling the complete tappet assembly flush with the terminal 18 of the valve stem.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In combination with a poppet-type valve including a push rod, a washer fixed to the lower end of the valve stem, and a coil spring surrounding the valve stem and seated against the washer, of a valve silencer comprising a resilient substantially U-shaped member, one leg of said member being anchored to the push rod, and the remaining leg of said member engaging the valve stem under the lower end of the spring and bearing upon said washer, and means holding the member against rotation relative to the push rod, said spring yieldingly retaining said remaining leg of said member against the washer.

2. In combination with a poppet-type valve including a push rod, a washer fixed to the lower end of the valve stem, and a coil spring surrounding the valve stem and seated against the washer, of a valve silencer comprising a resilient substantially U-shaped member having upper and lower legs, the lower leg of said member bearing against the lower face of a tappet adjusting nut, and the upper leg of said member engaging under the lower end of said spring and bearing against the upper face of said washer, and means holding the member against rotation relative to the tappet adjusting nut, said spring yieldingly retaining the upper leg of said member against said washer.

3. In combination with a poppet type valve including a push rod, a tappet carried by said push rod having a head, a washer fixed to the lower end of the valve stem, and a coil spring embracing the valve stem and seated against the washer, of a valve silencer comprising a substantially U-shaped member, said member including a lower leg having a slot receiving said tappet, and an upper leg having a slot receiving said valve stem, said upper leg bearing against the upper face of said washer and engaged under the spring, said lower leg bearing against the lower face of said tappet head, and means holding the member against rotation relative to the tappet head, said spring yieldingly retaining the upper leg of said member against the washer.

4. In combination with a poppet type valve including a push rod, a tappet carried by said push rod having a head, a washer fixed to the lower end of the valve stem, and a coil spring embracing the valve stem and having a lower terminal engaging the washer, of a valve silencer comprising a resilient member having spaced leg portions including an upper leg and a lower leg, said upper leg having a slot receiving said valve stem and disposed between said washer and the lower terminal of said coil spring, and the lower leg of said member being slotted and receiving the tappet, said lower leg bearing against the tappet head, and means holding the member against rotation relative to the tappet head.

5. The combination of claim 4 wherein said tappet head is multi-sided and said holding means includes a pair of upstanding lugs inclined relative to each other and engaging two faces of the multi-sided tappet head.

6. A clip for connecting a tappet head to a valve stem, said clip comprising a substantially U-shaped resilient member having upper and lower leg portions, each of said leg portions having an open notch at their outer ends, said notches being in registry with each other, said lower leg portion having an offset concavo-convexed inner end portion with the convex surface of said offset portion facing the upper leg portion to urge the leg portions toward each other, and a pair of outwardly converging lugs on the upper face of the lower leg portion adjacent the notch therein adapted to engage two side faces of a tappet head engaged with said lower leg portion.

7. A clip for connecting a tappet head to a valve stem, said clip comprising a substantially U-shaped resilient member having upper and lower limbs, said limbs being joined at their inner ends and having slots in their outer ends in registry with each other, the inner end of said lower limb having an offset concavo-convexed portion with the convex surface thereof facing the upper limb to urge the outer ends of the limbs toward each other, said outer end of said lower limb including a pair of outwardly converging side edges, and a lug formed with each side edge and extending upwardly from the upper face of the lower limb.

JOHN E. MICHELICH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,182,632	Bruegger	May 9, 1916
1,484,080	Revor	Feb. 19, 1924
1,988,212	Nisbet	Jan. 15, 1935
2,030,345	Zahodiakin	Feb. 11, 1936