Feb. 20, 1923. 1,446,142.

E. I. ADAMS.

VALVE SILENCER.

FILED DEC. 20, 1920.

Fig. 1

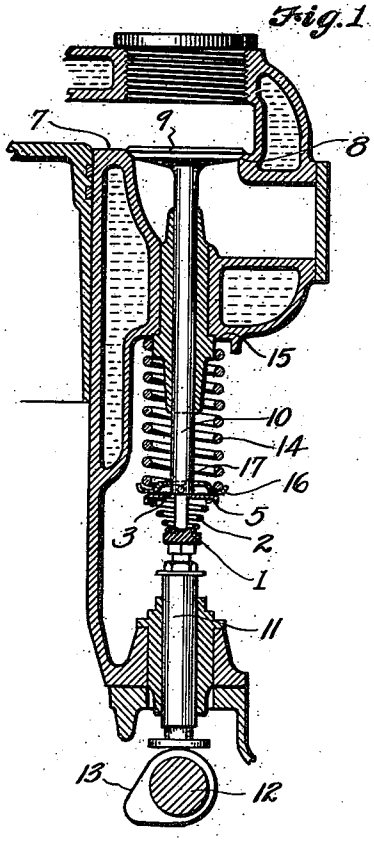


Fig. 2

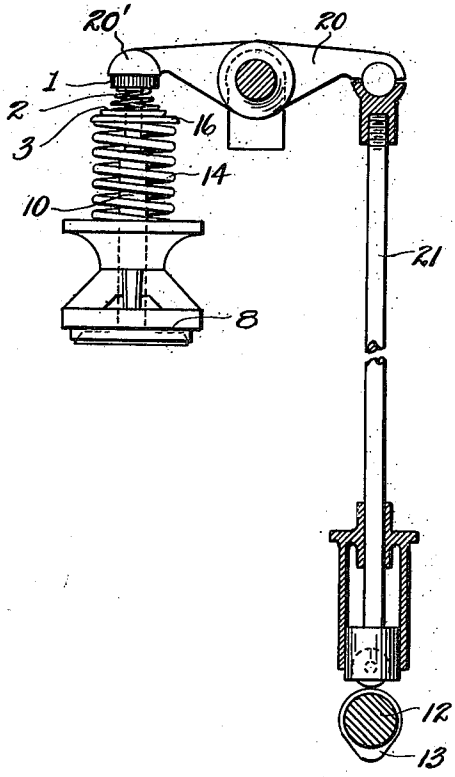


Fig. 3

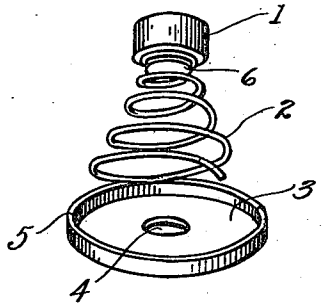
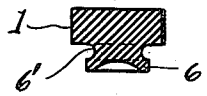


Fig. 4



Inventor

EMMANUEL I. ADAMS

By Attorney

Richard J. Cook

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UNITED STATES PATENT OFFICE.

EMMANUEL I. ADAMS, OF TACOMA, WASHINGTON.

VALVE SILENCER.

Application filed December 20, 1920. Serial No. 432,008.

To all whom it may concern:

Be it known that I, EMMANUEL I. ADAMS, a citizen of the United States, and a resident of the city of Tacoma, county of Pierce, State of Washington, have invented certain new and useful Improvements in Valve Silencers, of which the following is a specification.

This invention relates to valve silencers, and more particularly to means applicable to the valve actuating mechanism of the engine of an automobile, or like engine, for eliminating the clicking noises that, as a rule, are incidental to the valve operation. More specifically stated, it is the object of the invention to provide valve silencers that are applicable alike to the valve stems or rods of engines of the L or T head type and which comprise non-metallic impact members, to be disposed between the valve stems or rods and their tappets and coiled springs whereby the said members are held functionally in place, and looseness, caused by wear of the operating parts, taken up to eliminate all noise of operation.

In accomplishing this object I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 is a detail view showing a valve actuating stem equipped with a silencer constructed and applied according to the present invention.

Figure 2 is a similar view showing the device applied to the valve push rod in an engine of a type differing from that shown in Figure 1.

Figure 3 is a perspective view of the parts of the valve silencer removed from functional position.

Figure 4 is an enlarged sectional view of the silencer pad.

Referring more in detail to the drawings—

The valve silencer, in its preferred form consists of a small, round fibre pad, or washer 1 that is fixedly mounted at the smaller end of a conically tapered, spirally coiled spring 2, together with a spring seat, consisting of a disk 3 provided centrally with an aperture 4 and peripherally with a flange 5 within which the larger end of the spring is adapted to be supported in functional position. The pad 1 is provided on its under side with a concentric extension 6 wherein an annular groove 6′ is formed, and the smaller end of the spring is wound tightly in this groove to secure the pad thereto.

In Figures 1 and 2 of the drawings, 7 designates a part of an engine head provided with a valve seat 8 to which a valve 9 mounted at the end of a valve stem 10 is fitted. In Figure 1, 11 designates a valve tappet, 12 a cam shaft equipped with a cam 13 operable by connection with the engine crank shaft, not shown, to raise the tappet to actuate the valve, which is normally held in closed position by means of a spring 14 coiled about the stem and seated at its opposite ends against the engine wall 15 and in a spring seat 16 that is held on the stem by a pin 17 projected through the same.

In using the silencer with a valve mechanism of the above character, the plate 3 is applied to the lower end of the valve stem 10 with the end of the stem extending through the aperture 4 and the plate, in an inverted manner seated against the spring seat 16. The larger end of the spring 2 is then seated within the plate flange with the pad 1 disposed between the end of the valve stem and the head of the tappet.

In Figure 2 I have illustrated the use of the device in connection with valve mechanism of a different type of construction, wherein the valve stem 10 is engaged at its upper end by one end of a rocker lever 20 mounted centrally on a pin 21 and operatively connected at its opposite end with the upper end of a push rod 21 which is engaged at its lower end by the cam 13.

In applying the silencer to this latter type of construction, it is disposed between the spring seat 16 and the end 20′ of the lever 20, in the same manner as before described, but in an inverted position with respect to the first position.

With the device so constructed and applied, it is apparent that the pad will serve as a silencing buffer and will be held tightly against the tappet or rocker lever head by means of the spring 2 and in this way all looseness, or play, that comes from wear on the operating parts will be taken up and

the usual clicking noise caused by the operation of loose or worn valve mechanism will be eliminated.

Having thus described my invention what I claim as new therein and desire to secure by Letters-Patent, is:

1. The combination with a valve stem and its actuating tappet of a valve silencer comprising a compression spring disposed between the ends of the stem and tappet to urge these parts apart and a pad carried by the spring to be engaged at opposite sides by the stem and tappet when in operation.

2. The combination with a valve actuating stem and a tappet for operatively engaging said stem, of a valve silencer comprising a spring seat mounted about the said stem, a coiled spring having one end disposed against said seat, a pad carried by the opposite end of said spring and held thereby between the stem end and tappet for the purpose set forth.

3. The combination with a valve actuating stem and a tappet for operatively engaging said stem, of a valve silencer comprising a spring seat mounted about the said stem adjacent its end, a coiled spring disposed about the end of the stem with one end resting in said seat, a pad fixed to the opposite end of said spring and pressed thereby against said tappet to be actuated against said valve stem by actuation of the tappet.

4. In an engine-valve of the puppet type having a valve-stem, a spring-cap attached to the valve-stem, and a valve-spring bearing against the cap to hold the valve closed and a rocker arm operating through the valve-stem to open the valve, in combination with a take-up spring which is lighter than the valve-spring and a pad of sound-deadening material held by the take-up spring, the take-up spring being interposed between the rocker arm and the valve-stem with the pad over the end of the valve-stem.

5. In an engine-valve of the puppet type having a valve-stem, a spring-cap attached to the valve-stem, and a valve-spring bearing against the cap to hold the valve closed and a rocker arm operating through the valve-stem to open the valve, in combination with a take-up spring which is lighter than the valve-spring and a pad of sound deadening material with a neck engaged by the take-up spring, the take-up spring and pad being interposed between the rocker arm and valve-stem.

Signed at Seattle, Washington, this 14th day of December, 1920.

EMMANUEL I. ADAMS.