M. C. DART.

SILENCER FOR VALVES.

APPLICATION FILED JAN. 29, 1918.

1,287,252. Patented Dec. 10, 1918.

Fig. 1.

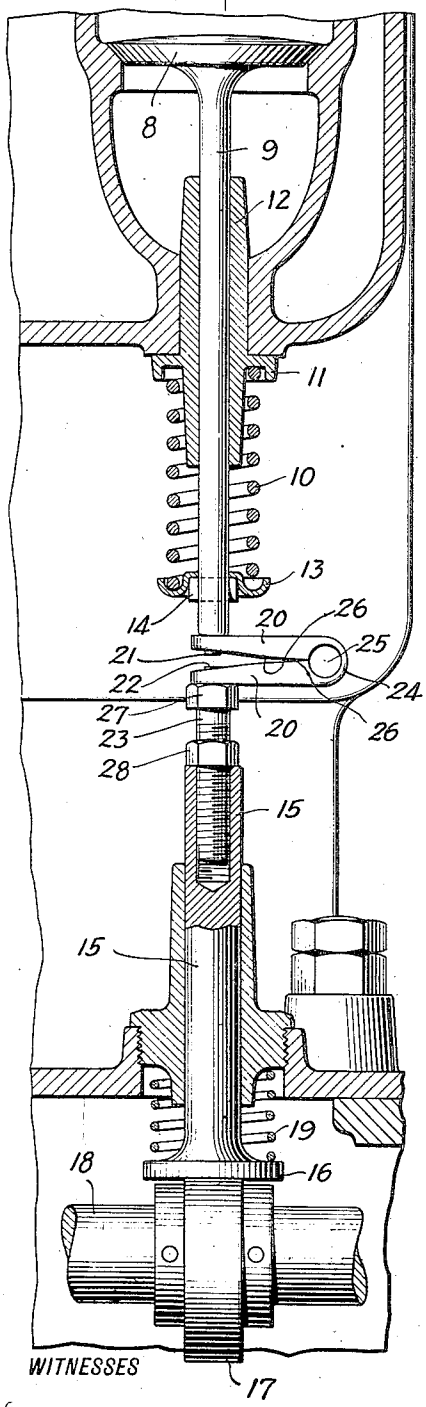


Fig. 2.

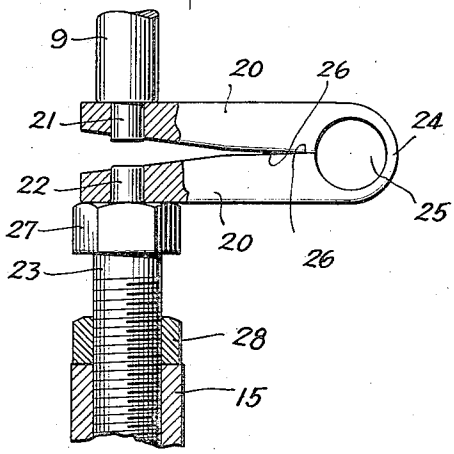
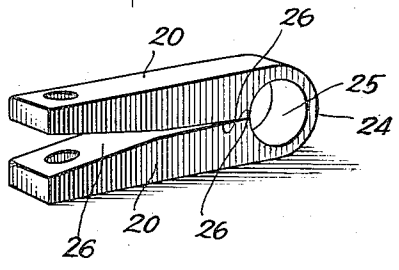


Fig. 3.



WITNESSES

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SILENCER FOR VALVES.

1,287,252. Specification of Letters Patent. Patented Dec. 10, 1918.

Application filed January 29, 1918. Serial No. 214,319.

To all whom it may concern:

Be it known that I, MELVIN C. DART, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county of Bronx and State of New York, have invented a new and Improved Silencer for Valves, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to compensate for the expansion and contraction of the metal parts of direct-acting valves; to avoid varying the action of the valve mechanism; and to simplify the construction of the silencer.

Drawings.

Figure 1 is a vertical section taken as on the median line of a valve mechanism of conventional form showing a silencer in conjunction therewith;

Fig. 2 is a detail view on an enlarged scale and partly in section, showing a silencer and in conjunction therewith fragments of a valve stem and a push rod therefor;

Fig. 3 is a perspective view of a silencer constructed and arranged in accordance with the present invention.

Description.

As seen in the drawings, the usual mechanical valve 8 has an elongated stem 9 and is held seated by a coil spring 10, one end of which rests in a cup flange 11 extending laterally from a bushing 12, and the opposite end in a cup 13 which is held on the stem 9 by a key 14 slipped through a perforation in the stem 9. Usually the end of the stem 9 is alined with but separated from the push rod 15 and adjusting bolt thereof sufficiently to insure the clearance usually found expedient to permit the valve 8 to close under working conditions. The push rod 15 has a flared foot 16, which bears on a cam 17 of the cam or "lay" shaft 18. The foot 16 is held in contact with the cam 17 by a compression spring 19.

In practice, the ends of the stem 9 and the rod 15 and adjustment element thereof, are separated when inactive and cold sufficiently to provide for the expansion of the stem 9 under active heated conditions.

The expansion of the stem in practice varies. The variations are due to many causes difficult to appreciate and provide for. This uncertainty is bound to lead to one of two inaccuracies resulting in an adjustment where when the stem expands, the valve does not seat with the concomitant loss of power due to the lack of compression, or in a "knock" in the valve mechanism due to the fact that the lower end of the stem of the valve is struck by the push rod with violence sufficient to produce a sharp clicking sound. These objections are overcome by the use of a silencer having resilient bifurcated members 20, the ends whereof are flared and are perforated to receive the nipples 21 and 22, the former being at the lower end of the stem 9 and the latter at the upper end of the adjusting bolt 23. The members 20 are integrally connected by a reduced section 24. The section 24 is formed in the silencer by providing the same with an open bore 25 extended through the rear or joined end of the silencer.

The members 20 have slightly curved surfaces 26. Normally the surfaces 26 forward of the inner ends thereof are separated when the silencer is supporting the stem 9. The tension of the spring 10 is greater than the tension of the section 24 of the silencer, and operates to close the members 20 at the inner ends thereof. The resistance of the section 24 increases rapidly as the members 20 are compressed. This tension is quickly increased to a degree greater than the tension of the forward portions of the members 20. When the cam 17 lifts the push rod 15, the resilient members 20 yield forward of the point of contact of the same. The resistance of the members 20 increases rapidly and overcomes the resistance of the spring 10 when the point of contact between said members 20 is intermediate the ends of said members. At no time in service do the members 20 close in line with the push rod and valve stem. Thus the possibility of establishing a "valve knock" is avoided.

To facilitate the adjustment of the silencer to engines of standard make, the push rods 15 are provided with adjusting bolts 23 on which a wrench head 27 and the nipple 22 are formed. The stem 9 of the valve 8 may be reduced to form the nipple 21, or the nipple 21 may be structurally connected with the said stem by providing a tapped hole in the end of said stem to receive a threaded portion of said nipple.

When the bolt 23 has been adjusted, using for that purpose the wrench head 27, the ad-

justed position is secured by using the follower or lock nut 28 in a manner common to constructions of this character.

Claims.

1. The combination of a mechanically lifting valve having an extended stem; a seating spring for seating said valve; and a U-shaped bifurcated member operatively engaging said stem for lifting said valve and the connection between the bifurcates of said member having a resistance adapted to yield to the pressure of said spring; and means for arresting the action of said bifurcates to limit without shock the action thereof.

2. In combination with a stem-lifted valve; a valve-lifting mechanism embodying an actuated cam; and a flared bifurcated member having a plurality of curved spring leaves, the flared ends whereof are operatively connected with and disposed between said cam and said valve, said leaves being adapted to progressively engage to increase the resistance thereof from a tension less than the seating force of said valve to greater than said seating force of said valve.

MELVIN C. DART.