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VALVE MECHANISM FOR INTERNAL COMBUSTION ENGINES

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Fig. 1.

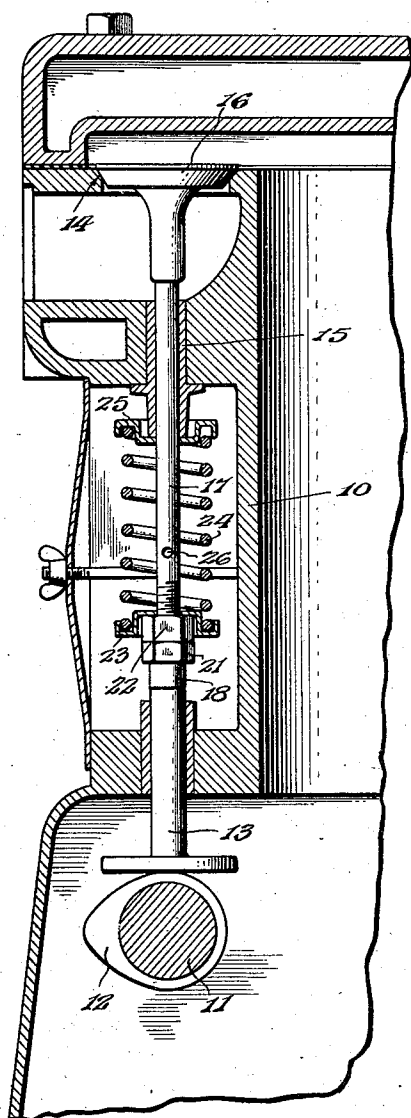
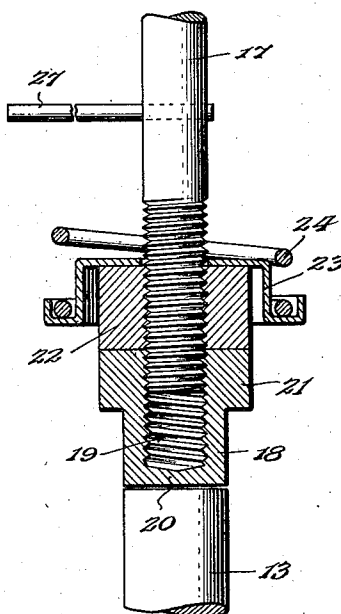


Fig. 2.



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VALVE MECHANISM FOR INTERNAL-COMBUSTION ENGINES.

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This invention relates to an improved valve mechanism for internal combustion engines and while being well adapted for general use is, nevertheless, more particularly intended to be employed in connection with the engines of Ford motor vehicles.

The invention seeks, among other objects, to provide means which may be adjusted for varying the clearance between the valve tappets and the valves.

The invention seeks, as a further object, to provide each valve with an adjustable foot to coact with the valve tappet, wherein the foot will be formed of hardened metal so that wear will be reduced to a minimum, and wherein locking means will be provided for the foot.

And the invention seeks, as a still further object, to provide a mechanism wherein the locking means for the valve foot will also provide a supporting abutment for the lower seat of the valve spring so that when any adjustment is made in the position of the foot and the locking means therefor, a corresponding adjustment will be made in the tension on the valve spring.

Other objects of the invention not specifically mentioned in the foregoing, will appear during the course of the following description.

In the accompanying drawings:

Figure 1 is a vertical sectional view showing our improved mechanism in connection with a Ford engine.

Figure 2 is an enlarged detail sectional view particularly showing the mounting of the foot of the valve.

As is well known, the Ford engine, as at present delivered from the factory, embodies no means whereby the clearance between the valve tappets and the valve stems may be adjusted or varied and, accordingly, after the parts become worn, which soon occurs, it is necessary, in order to eliminate the noise resulting from the excess clearance between the valve tappets and the valve stems, to either elongate the valve stems by hammering thereon or else install entirely new valves. The former procedure is very inaccurate while the latter procedure necessarily entails considerable expense. The present invention, therefore, seeks to overcome these difficulties. In the drawings, a portion of one of the cylinders of a Ford engine is indicated at 10, the cam shaft at 11, one of the cams at 12, and the cooperating

tappet at 13. The associated valve seat of the engine is indicated at 14 and the axially aligned valve guide at 15.

In accordance with the present improvements, the usual valves of the engine are supplanted by the valves of the present invention and in the following description we shall describe one of the valves and associated parts in detail as typical of all. The valve is indicated at 16. This valve is formed to coact with the seat 14 and is provided with a stem 17 which is freely slidable through the guide 15. As particularly seen in Figure 2, the stem is threaded at its lower end, and screwed thereon is a preferably case hardened foot 18 having an axial threaded socket 19 to accommodate the lower terminal of the stem. At its lower end, the foot is provided with a flat end wall 20 to coact with the tappet 13 while, at its upper end, the foot is formed with a hexagonal wrench-receiving head 2. Screwed on the lower end of the stem above the foot 18, to seat flat against the head 2 thereof, is a lock nut 22, and freely surrounding the stem to seat flat against said nut is the usual lower valve spring seat 23. The lower end of the customary valve spring 24 rests in this seat, and freely surrounding the valve stem to abut the valve guide 15 is the usual upper spring seat 25 for said spring. Formed in the valve stem 17 near the lower end thereof is an opening 26 which, as shown in Figure 2, is adapted to removably receive a suitable pin, as indicated at 27.

As will now be seen, the foot 18 may be adjusted on the lower end of the valve stem 17 until the desired clearance between said foot and the tappet 13 is obtained when, by adjusting the nut 22 into binding engagement with the foot, the foot may be locked in adjusted position. Thus, wear on the foot or on the tappet may be readily taken up. However, since the foot is formed of case hardened material, very little wear on the foot will occur and, accordingly, frequent adjustment of the foot will be found unnecessary. The opening 26 in the valve stem is provided in order that the valve stem may, by the use of the pin 27 or other similar device, be held against rotation so that the foot may be adjusted on the valve stem to a nicety while, also, the nut 22 may be adjusted into firm binding engagement with the foot. As will be observed, the nut 22 pro-

vides a supporting abutment for the lower spring seat 23 and, accordingly, as the foot 18 is adjusted on the valve stem and the nut is adjusted into engagement with the foot, a corresponding adjustment will be made in the tension of the valve spring so that by maintaining the clearance between the tappet and the foot substantially constant, the travel of the valve will be maintained correspondingly constant, with the result that the strain on the spring, when flexed by the opening of the valve, will also be maintained substantially constant. Furthermore, since the same clearance will be maintained between all of the tappets of the engine and all of the valves, the working stress on the valve springs, when the engine is in operation, will be substantially uniform. Premature fatigue of any one of the springs will thus be avoided while also, the liability of fracture of the springs will be reduced to a minimum.

Having thus described the invention, what we claim is:

25 1. In an internal combustion engine, a tappet, a cam shaft having a cam to coact with the tappet, a valve guide, a valve having a stem slidable through said guide, and

a foot carried by the valve stem to coact with the tappet and adjustable on the stem for varying the clearance between the foot and tappet, the valve stem being provided with an opening to removably receive a device manually engageable for holding the valve stem against rotation while the foot is being adjusted. 35

2. In an internal combustion engine, a tappet, a cam shaft having a cam to coact with the tappet, a valve guide, a valve having a stem slidable through said guide, a foot 40 screwed over the lower end of the valve stem to coact with the tappet and having a threaded socket accommodating the lower terminal of the stem, the foot being adjustable on the stem for varying the clearance 45 between the foot and tappet, a nut adjustably mounted on the stem to abut said foot for locking the foot in adjusted position, a spring normally holding the valve closed and a seat spring freely carried by the valve stem and 50 mounted upon the nut and adjustable upon the stem upon adjustment of the nut.

In testimony whereof we affix our signatures.

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