June 30, 1936. E. F. FISHER 2,046,255

VALVE OPERATING DEVICE

Original Filed March 13, 1933

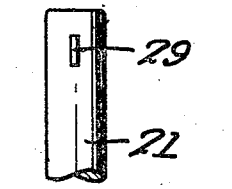


Fig. 2.

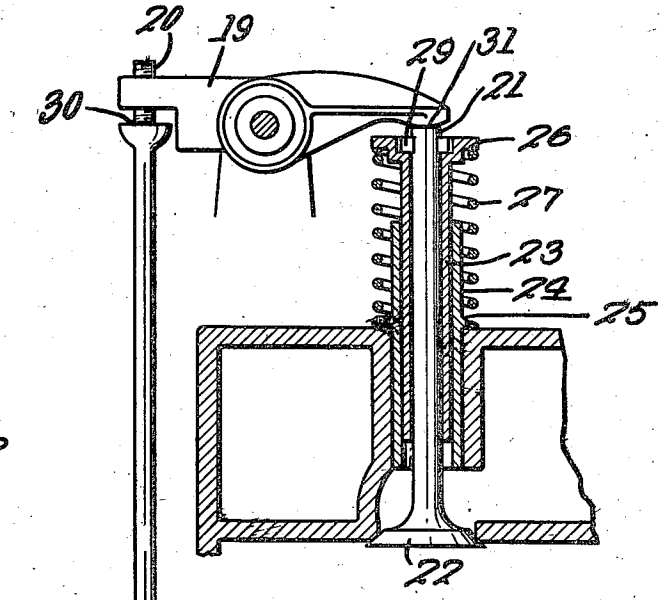
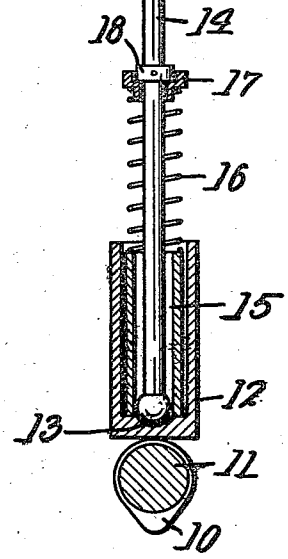


Fig. 1.



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VALVE OPERATING DEVICE

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2 Claims. (Cl. 123—188)

The principal objects of this invention are to provide means for eliminating noise in the valve action of an internal combustion engine of the type in which the valves are in the cylinder head; to prevent the valve stem from wearing off on one side on account of getting out of central vertical position; to eliminate the sticking of the valves, and to accomplish these objects with a minimum amount of attention and lubrication.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is a vertical sectional view of a valve operating mechanism embodying the valve mechanism constituting a preferred embodiment of this invention, and

Fig. 2 is a side view of the top of the valve rod.

The method of operating the valve in a cylinder head of the above description, which is commonly used, results in the production of noise after the parts have worn a little and got out of adjustment. This results in additional wear and improper action to the valve. Furthermore, these valves have a tendency to get out of place to the extent of tilting slightly, thereby wearing the stem on one side. After being used awhile the surface is worn off one side of the valve stem and the valve does not seat properly and, furthermore, it is a difficult thing to repair the valve.

This invention is designed to obviate these disadvantages. The power, of course, for operating the valve is obtained from the cam **10** on the cam shaft **11** on which rests a push rod lifter **12**. This push rod lifter is cup-shaped and has a concave recess **13** in the bottom in which rests the globular end of a push rod **14**. This recess is at the bottom of the cup-shaped rod lifter **12** and consequently always contains oil so that there is an oil cushion at this point. In the push rod lifter is a hollow cylinder **15**, shorter than the lifter, through which the push rod passes and which supports a spring **16**. This construction leaves a recess in the top of the push rod lifter for receiving the bottom of the spring. The spring is mounted under a recessed washer **17**, which bears against a collar **18** fixed to the push rod. In this way there is a yielding spring action to force the push rod up.

The push rod, of course, engages the rocker arm **19**, preferably through an adjusting screw **20**. This rocker arm bears on the top of the valve stem **21** which carries the valve **22** integral with it.

The valve stem is located in a cast iron sleeve **23** running in a cast iron guide **24**. The guide has a circular boss **25** resting on the engine head and is stationary. The sleeve has a slidable fit in the guide and on the valve stem and it is provided with an integral spring seat **26** at the top. The sliding fit of the sleeve on the valve stem is for the purpose of facilitating the removal of the sleeve when the valve stem key **29** is withdrawn.

Resting on the engine head and engaging the bottom of this seat is a spring **27** materially stronger than the spring **16**. The spring seat **26** is recessed to receive the valve stem key **29** which positively connects the valve stem and sleeve, but is removable to permit the sleeve to be removed upwardly.

On account of the design of the cast iron sleeve **23** with an integral spring seat correct distribution of the heat is facilitated. The guide **24** being stationary constitutes a sufficient guide for the sleeve **23** and together they prevent the tilting of the valve stem and the valve and necessitates the valve working on a vertical line at all times. This prevents the wear of the side of this stem.

The prevention of noise is further assisted by the spring **16** resting in what amounts to a recess in the top of the push rod lifter over the cylinder **15** and exerting upward pressure against the washer **17** and collar **18**. This takes up the slack at the points **30** and **31** where the rocker arm or its adjusting screw engages vertically operating rods. This also transfers the clearance to the concave surface **13** where the action is cushioned by the oil necessarily draining down the rod into this concave surface.

In this way a noiseless action is secured even after the parts are worn and an integral spring seat **26** is provided which prevents spring vibration.

Although I have illustrated and described only one form of the invention, I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited in this respect, otherwise than as set forth in the claims, but what I claim is:—

1. The combination with an internal combustion engine valve, its stem and rocker arm, of a stationary guide, a sleeve having a sliding fit in the guide and on the stem and provided at the top with an integral spring seat, the stem and sleeve being connected to move together, and a

spring engaging the seat for holding the valve yieldingly against the seat.

2. The combination with an internal combustion engine valve and its stem, of a cylinder head in which the valve is located, a guide spaced from the stem and normally resting fixedly on said head, a sleeve having a sliding fit in the guide and normally fixed to, but removable from the stem, and capable of moving longitudinally with the stem, a spring seat fixed to the stem, means for moving the stem and sleeve longitudinally, and a spring between the head and the seat on the sleeve for holding the sleeve and valve stem outwardly.

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