

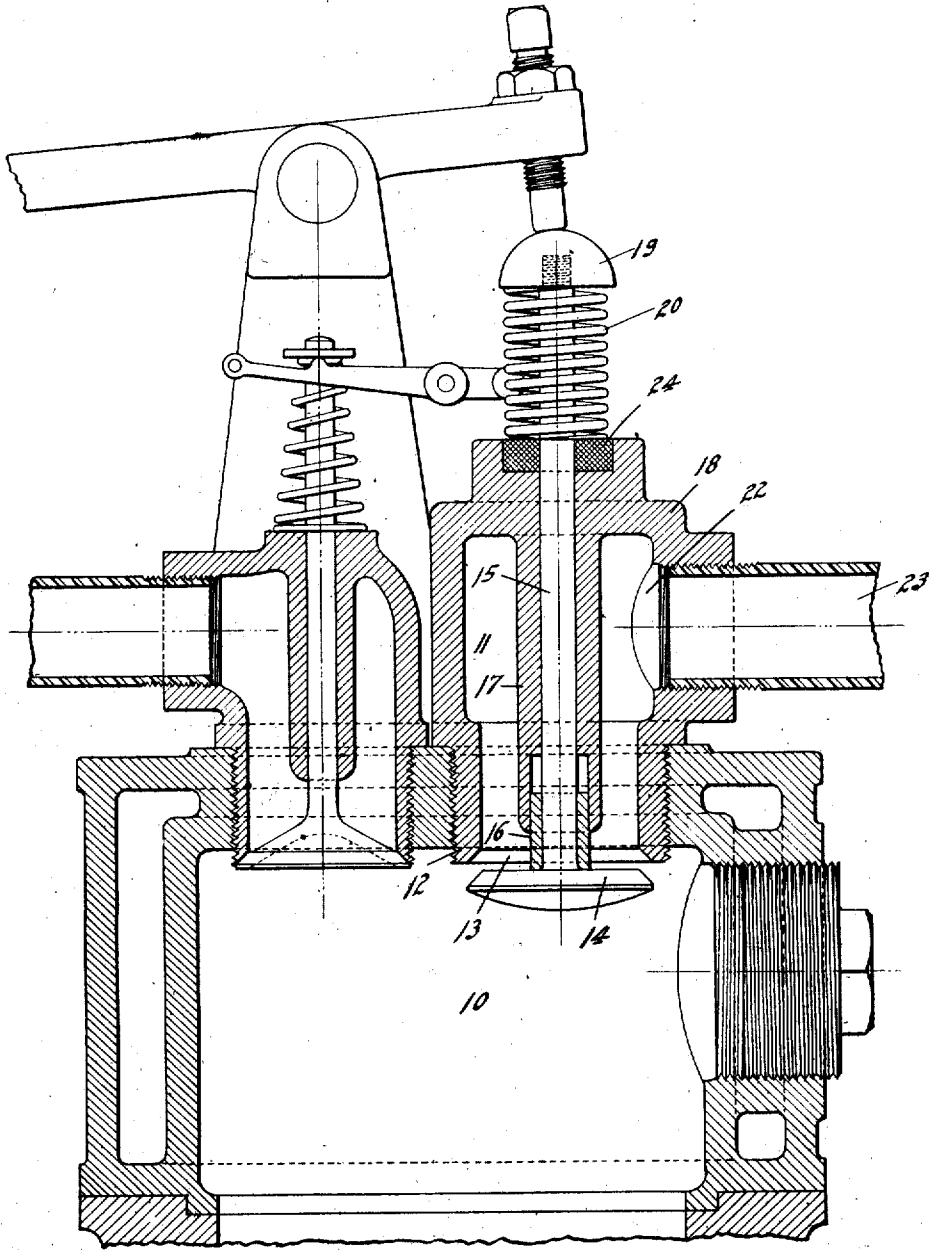
G. L. CROOK.

VALVE.

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933,698.

Patented Sept. 7, 1909.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE LOUIS CROOK, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO ATLAS ENGINE WORKS, TRUSTEE, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

VALVE.

933,698.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed September 24, 1908. Serial No. 454,661.

To all whom it may concern:

Be it known that I, GEORGE LOUIS CROOK, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Valves, of which the following is a specification.

It is almost universal practice in the construction of internal combustion engines to provide, for the release of the spent gases, a puppet valve made of steel, with its seat on the inside of the wall or head of the cylinder or combustion chamber. The stem of the valve projects through a guide sleeve attached to or forming a part of the exhaust passage and at its outer end is reached by the mechanism which operates the valve. That portion of the valve stem which is within the exhaust passage, between the guide sleeve and the valve disk, is exposed to the exhaust gases, which have a very corrosive and destructive action upon it, rendering frequent renewal necessary.

The object of my invention is to provide a means for protecting the valve stem from this action of the hot exhaust gases.

The character of the duty required of the exhaust valve is such as to subject it to a continual succession of shocks and strains so severe as to necessitate the utmost strength and lightness of material procurable. Nothing has yet been found better adapted to the service than high quality steel. But steel, as before mentioned, is injuriously affected by the exhaust gases. Bronze, which rivals steel in strength, is subject to the same defect, while cast iron, which is much too weak a material to stand the strains to which the valve stem is subjected, is but little affected by the gases. Taking advantage of this observed fact, I prolong the cast iron guide sleeve into the exhaust passage so as to cover and protect the valve stem. If the guide sleeve were to extend quite to the valve disk so as to cover the whole stem when the valve is closed, there would still be a portion of the stem exposed when the valve is opened. Therefore, I make a tightly fitting sleeve a little longer than the portion of the valve stem which is exposed by opening the valve,

and fasten it in any convenient manner around the valve stem next to the disk, and I make the guide sleeve thick enough to allow of counterboring the opening through which the valve stem passes so that the sleeve which is fastened around the valve stem may telescope a sufficient distance into the guide sleeve when the valve is closed. Thus, whether the valve be opened or closed the valve stem will be completely covered by the cast iron sleeves, and the corrosive gases being thus prevented from reaching it, will remain intact and fit for service indefinitely.

This device is fully illustrated in the drawing hereto attached which forms part of this specification.

The drawing represents a sectional view of the valve and its adjuncts.

In the drawings, 10 indicates a portion of the engine's cylinder which serves as a combustion chamber, 11 the exhaust valve chamber, the neck 12 of which may be inserted either in the side of the cylinder, or in the cylinder head. In the bottom of the neck 12 is formed the seat 13 for the valve disk 14 the stem 15 of which bears the protecting sleeve 16 of cast iron fastened thereon. Sleeve 16 telescopes closely into the counterbore of the guide sleeve 17 which may be integral with the structure 18. The valve stem 15 projects through the guide sleeve 17 and is provided on its outer end with a button 19 against which abuts a spring 20 which serves to hold the valve closed. When the valve is opened the spent gases flow out through the valve seat 13 into the valve chamber 11 and thence through the exhaust orifice 22 and the exhaust pipe 23 into the atmosphere. The spring 20 rests upon a washer 24 of asbestos or other suitable non-conducting material which protects the spring from injury by heat. The forms and arrangement of these parts may be modified as conditions may require without affecting the validity of my invention.

I claim as my invention:—

An exhaust valve structure comprising a main hollow body having a non-corrodible valve-stem guide counterbored at its lower

end, a valve having a corrodible stem passing through said guide and its counterbore, and a sleeve of non-corrodible material secured to the stem adjacent the valve and fitting the counterbore of the guide.

5 In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana,

this 17th day of September, A. D. one thousand nine hundred and eight.

GEORGE LOUIS CROOK. [L. S.]

Witnesses:

ARTHUR M. HOOD,
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