E. DUGAR.

STEAM ENGINE VALVE.

APPLICATION FILED JULY 30, 1908.

919,330. Patented Apr. 27, 1909.

Fig. 1.

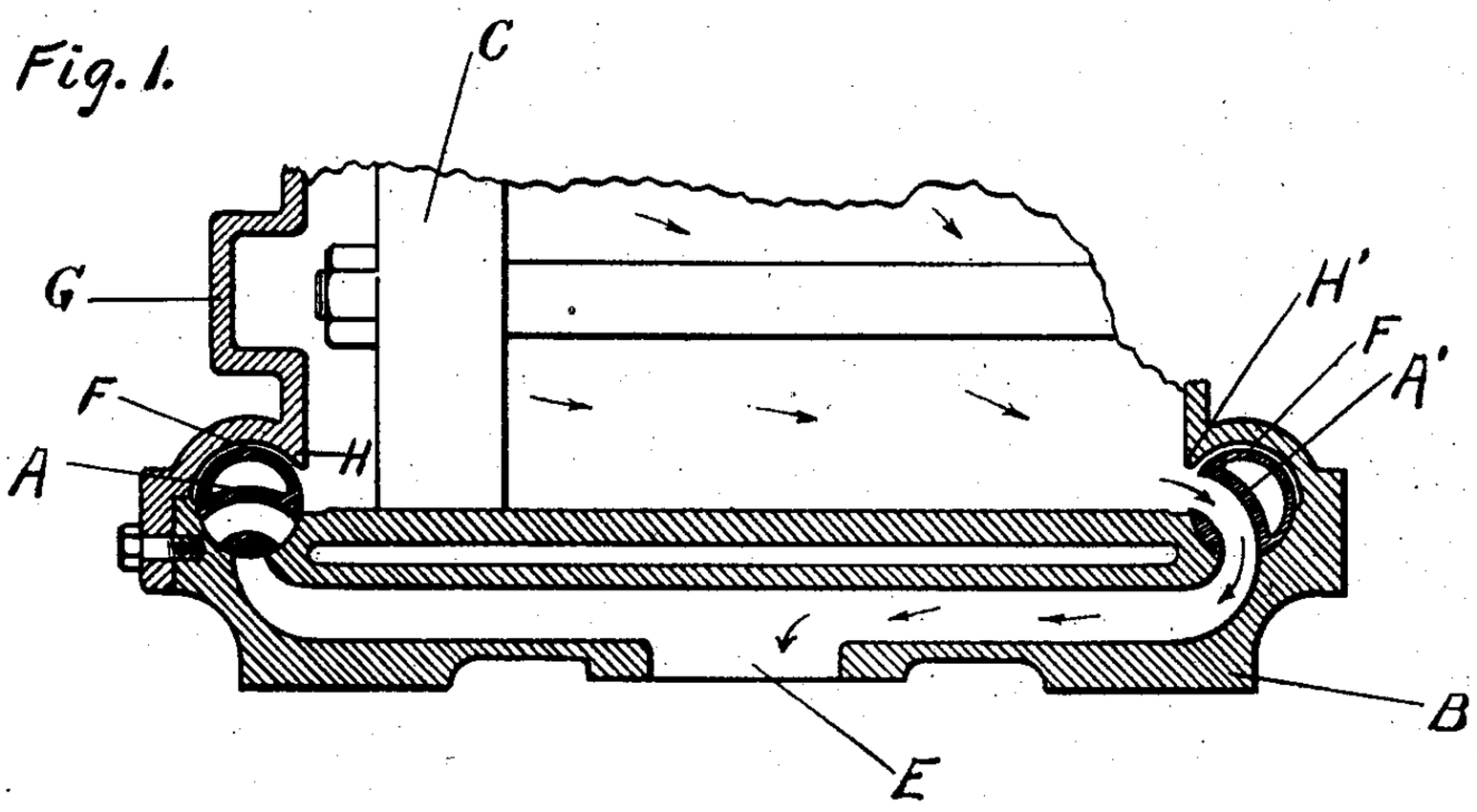


Fig. 2.

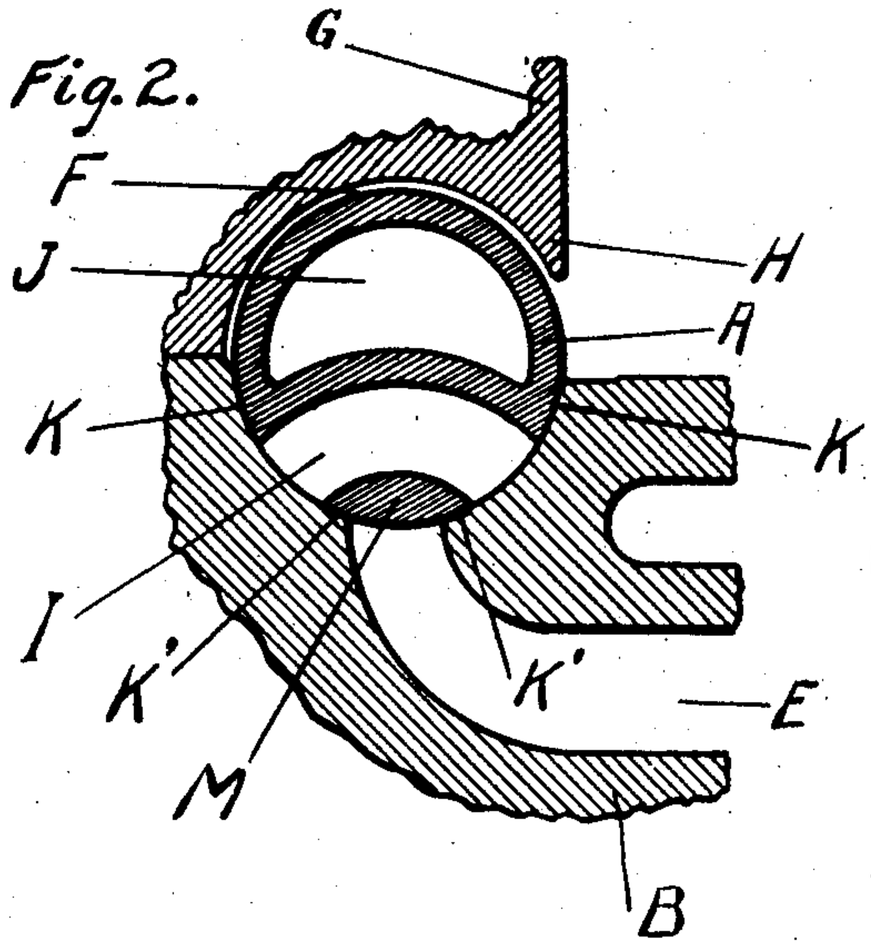
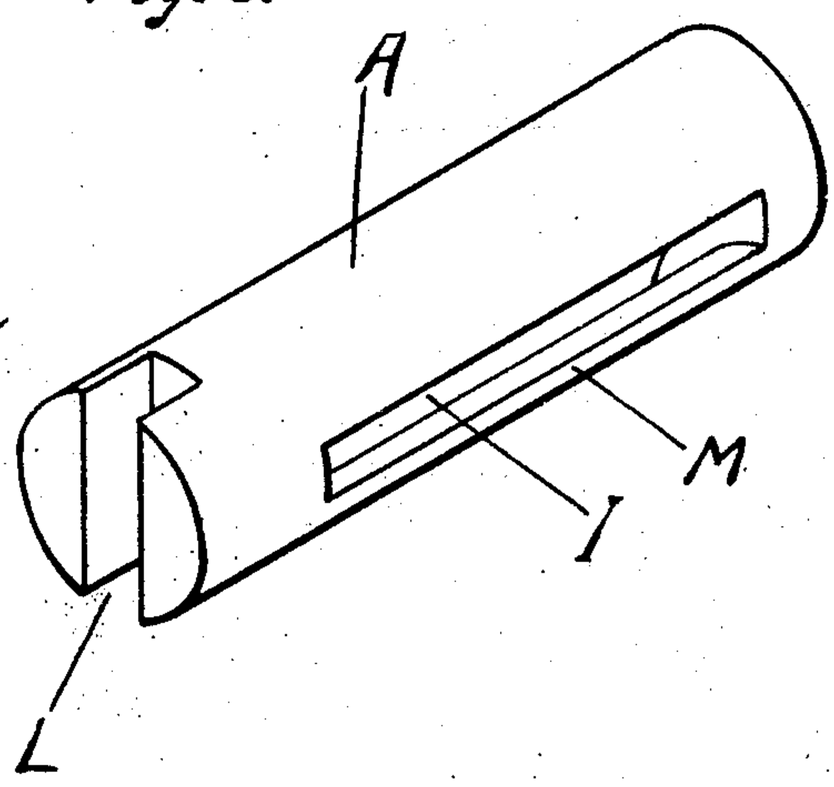


Fig. 3.



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UNITED STATES PATENT OFFICE.

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STEAM-ENGINE VALVE.

No. 919,330. Specification of Letters Patent. Patented April 27, 1909.

Application filed July 30, 1908. Serial No. 446,074.

To all whom it may concern:

Be it known that I, EDELBERT DUGAR, a citizen of the United States, residing at Oxford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Steam-Engine Valves; and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being had to the accompanying drawing, wherein like characters represent like parts throughout the several views, which form part of this specification.

This invention relates to the general class of oscillating valves for steam engines known as "Corliss" valves and more particularly to those valves that control the exhaustion or eduction of the steam from the engine cylinder and commonly termed exhaust valves.

An object of this invention is to increase the thermal efficiency of the steam engine, by decreasing to practical elimination, the clearance space or that portion of the cylinder volume which is not actually swept through by the piston in its travel, which space is always a source of loss and will hereinafter be designated as clearance.

A further object of this invention is to close the valve against the passage of the steam by two separate and distinct surfaces of closure.

A further object of this invention is to provide a passage for the eduction of the steam from the engine cylinder, substantially circular in outline, and which shall be free from sharp bends, corners or any other obstructions which shall retard or otherwise prevent an unrestricted flow of the steam.

The foregoing and other objects are obtained by my invention as herein described and illustrated by the accompanying drawings wherein,—

Figure 1, is a vertical longitudinal sectional view, taken through the center of that portion of a steam engine cylinder which contains the exhaust valves. Fig. 2, is an enlarged sectional view through one of the valves which shows more clearly the valve with relation to its seat. Fig. 3, is a perspective view in elevation of a valve.

In the drawings B denotes a portion of the main cylinder casting of a steam engine adapted to the use of oscillating valves, C being the reciprocating piston therein.

A, denotes my improved valve which (Fig. 3.) is substantially cylindrical in shape, which practically fills the valve chamber and is actuated in an oscillating manner by a coacting member engaging slot L, this being the customary method of operating this style of valves.

The port or steam passage I through the valve is curved in cross sectional outline, and extends lengthwise of the valve parallel to its axis terminating at points a short distance from either end of the valve.

The portion M, being cast integral with the valve is carefully fitted or machined to the full circular cross sectional outline of the valve and forms with coacting members one of the surfaces of closure as hereinafter described. In large valves of this type the weight should preferably be reduced and I accomplish this by coring the inclosed chamber J; care being exercised to tightly plug the apertures in the valve through which the said core is removed.

The valve chamber, or that portion of the engine in which the valve oscillates, is denoted by F and is formed entirely by the main cylinder casting B at the forward end of the cylinder, and partially by B at the rearward end and partially by the cylinder head G. At the forward end the casting B and at the rearward end the head G have downwardly projecting portions H′ and H respectively. These portions are for the purpose of more perfectly inclosing the valve thus occupying the space, termed clearance, which necessarily in engines of this type, would otherwise have to be filled with steam.

The valve A at the rearward end of the cylinder is represented in the position of closure against the passage of steam, while the valve A′ at the forward end is represented in its position when opened to permit the eduction of steam into the exhaust passages E, the course of the steam being indicated by arrows. The position of the valve A′ indicates the proper arrangement of the members whereby I obtain a clear, liberal and unobstructed outlet for the steam.

The portions K and K′ of the cylinder casting B are carefully fitted to the circular outline of the valve A and in coacting therewith form the valve seat or that portion which presents the obstruction to the passage of steam when the valve is closed. In my invention I have arranged the valve A and its coacting portions K and K′ of the casting B to occupy a space entirely on one side of the center line of the valve. By this arrangement it is evident that the wear causes

a more perfect contact of the valve with its seat. Furthermore by allowing valve A to come in contact with its seat on casting B at the two spaces K and K′ I am enabled to obtain two distinct surfaces of closure against the passage of steam, the thoroughness of this closure on each surface being more perfectly established by the wear of the coacting members.

Various changes in the form, proportion, arrangement and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

I claim—

1. In a steam engine, a cylinder having a casting with valve engaging portions, a valve engaged by said portions, the valve being in such relation to the engaging portions that the said engagement occurs wholly on one side of the center line of the valve.

2. In a steam engine, a cylinder head having downwardly projecting portions, a cylinder casting having a valve seat engaging the valve entirely on one side of the center of said valve, the said seat of the casting being in such relation to the projecting portions of the cylinder head as to produce a valve chamber with seats having two surfaces of closure against the passage of steam.

3. In a steam engine, a cylinder head having downwardly projecting portions, a cylinder casting having valve seats, the said casting being in such relation to the downwardly projecting portions of the head as to form valve chambers, valves in the chambers in engagement with the cylinder casting, the point of engagement of the valves and casting being wholly on one side of the center lines of the valves.

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