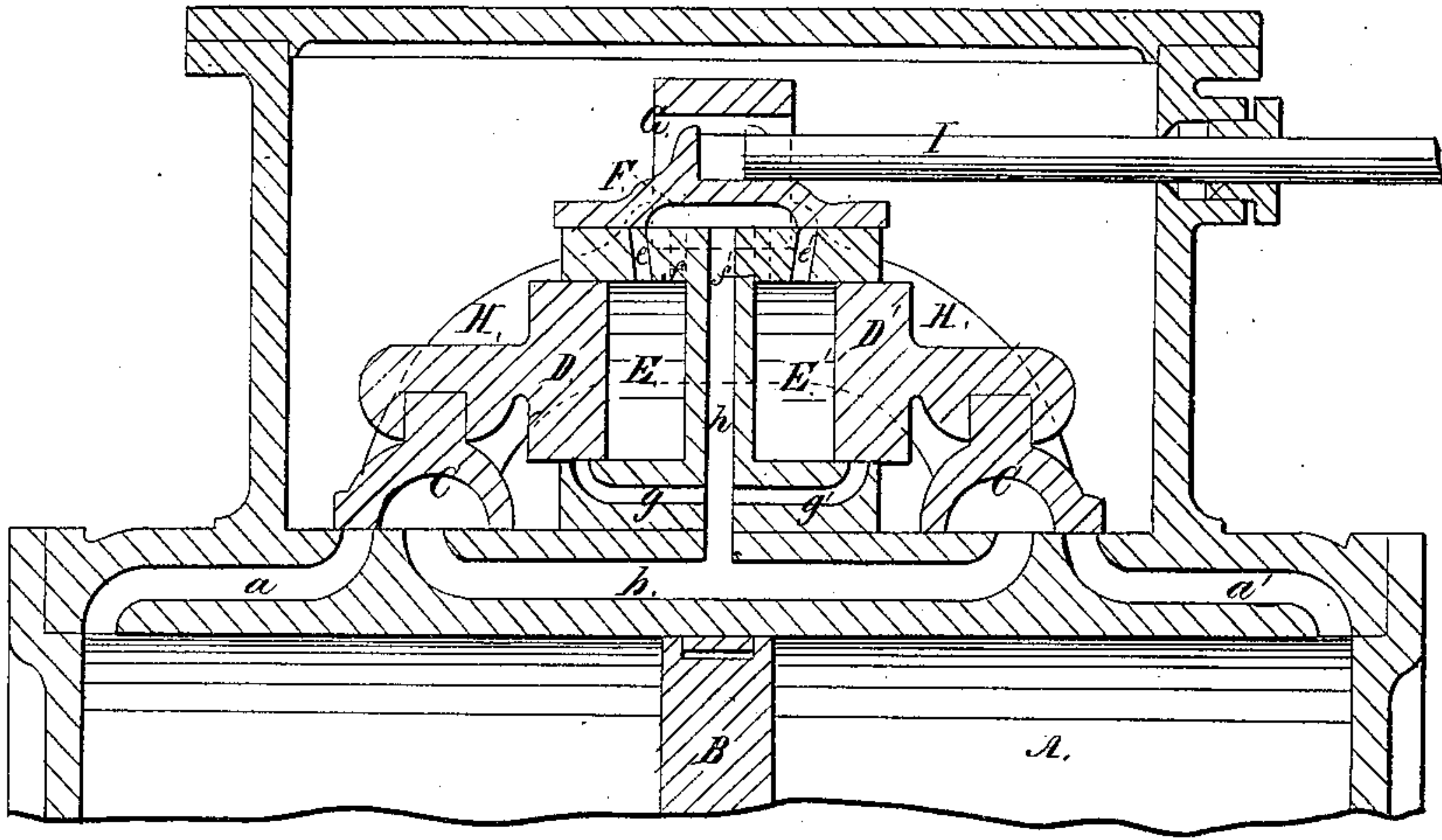


*Steam Slide Valve.*

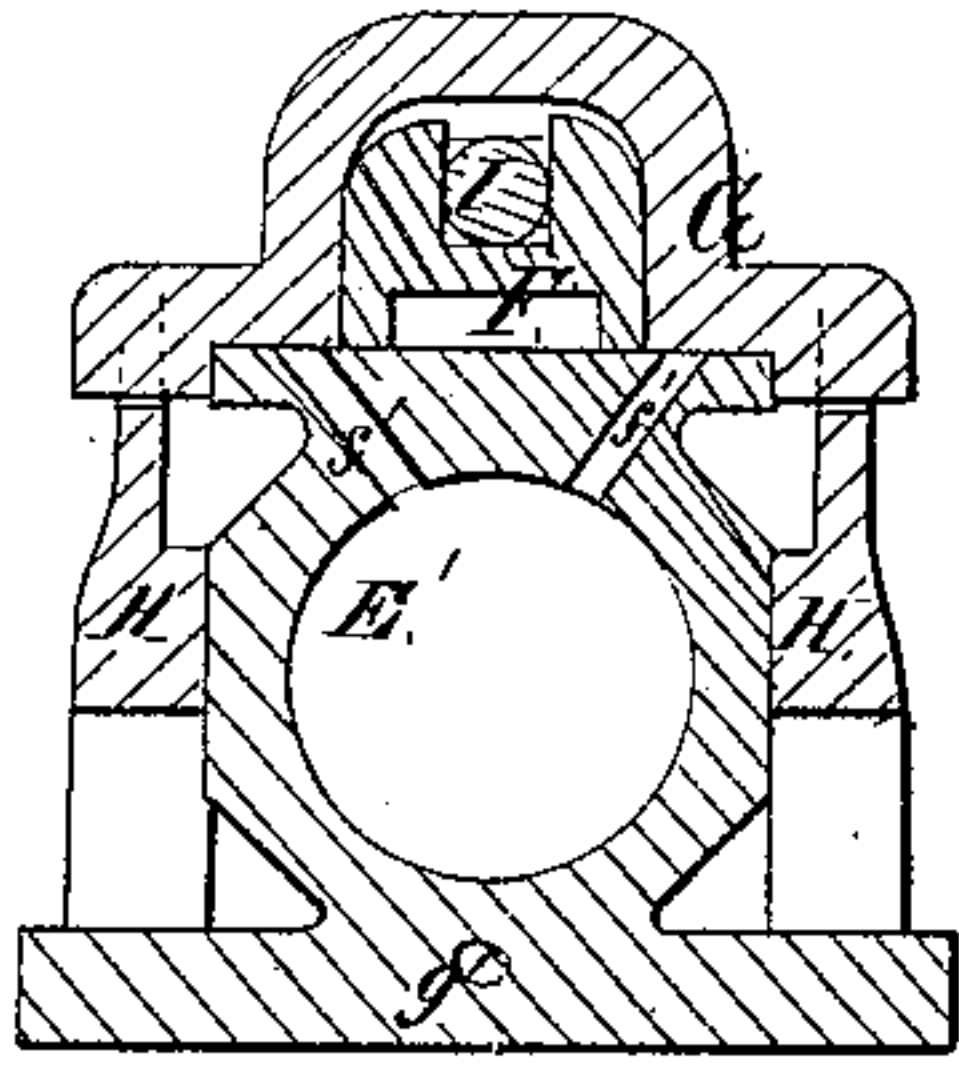
*N<sup>o</sup> 23,885.*

*Patented May 3, 1859.*

*Fig 1.*



*Fig. 2*

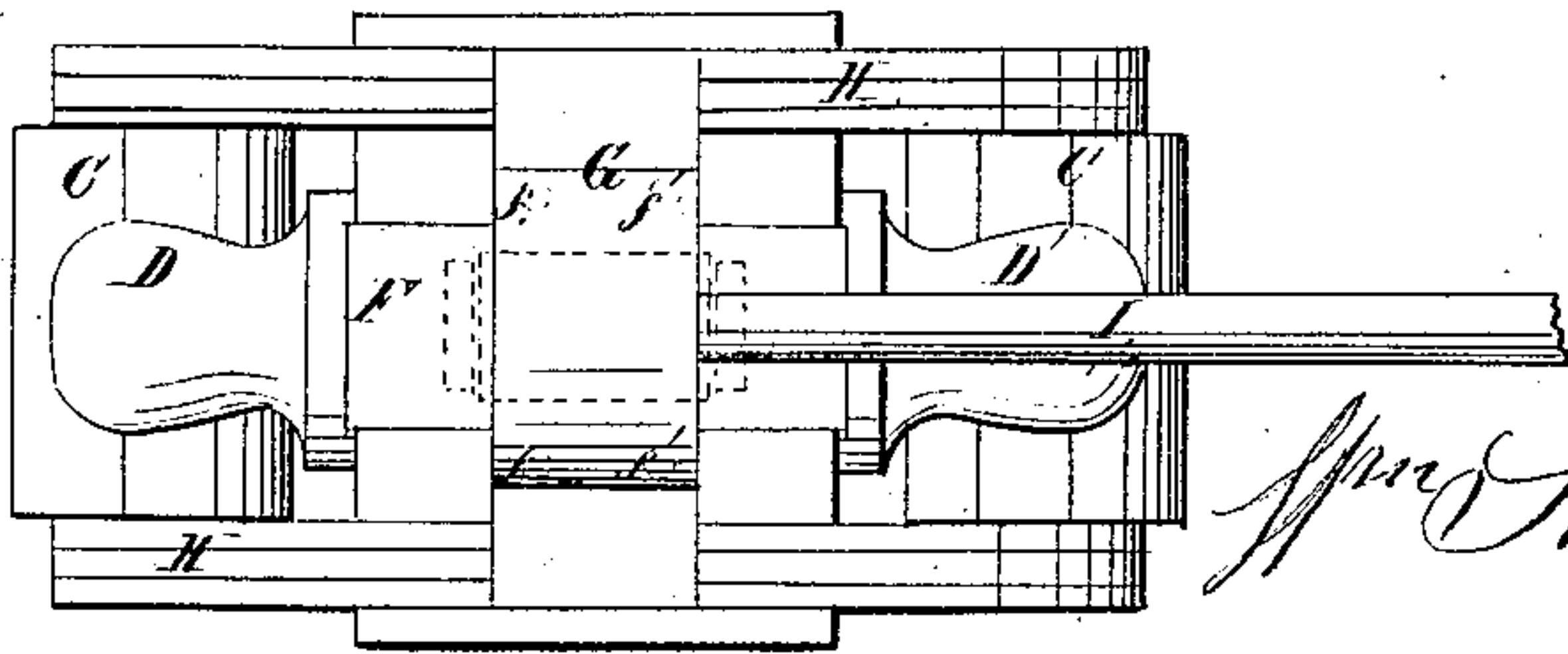


Witnesses:

John Quincy

Thos D. How

*Fig: 3.*



*Inventor:*

Amos Shephard, Junr



# UNITED STATES PATENT OFFICE.

WM. SHEPHERD, JR., OF BROOKLYN, NEW YORK, ASSIGNOR TO THOS. HOLMES AND VAN WYCK FOSTER, OF SAME PLACE.

## VALVE FOR STEAM-ENGINES.

Specification of Letters Patent No. 23,885, dated May 3, 1859.

*To all whom it may concern:*

Be it known that I, WILLIAM SHEPHERD, Jr., of Brooklyn, Eastern District, in the county of Kings and State of New York, have invented an Improvement in Valves for Steam-Engines, the construction and operation of which I have described in the following specification and illustrated in its accompanying drawings with sufficient clearness to enable competent and skilful workmen in the arts to which it pertains or is most nearly allied to make and use my invention.

My invention relates more particularly to that class of engines which are used for pumping water by means of a direct attachment of the engine to the pump, though it is believed that it may be applied with advantage to some other engines. In these engines for pumping, a valve has been operated by the direct action of the piston rod, which valve either admits and cuts off the steam to and from the cylinder, or admits and cuts off steam to operate one that does. Till recently the former mode of operating has been the one employed.

In the patent granted to Robert H. Fletcher the 15th day of September, 1857, an invention is described in which the valve which controls the admission of steam to the cylinder is operated by the direct action of steam which is admitted to work it, by means of another valve which is operated by the direct action of the piston rod. The operation of this device, while in the main, satisfactory, is, nevertheless, open to the objection of the slamming of the valves at the end of each valve stroke, which besides abrading and destroying the parts, makes an amount of noise which is exceedingly unpleasant. To prevent this slamming of the valve is the object and purpose of my invention.

In the patent of Edward G. Barrett January 19th, 1858, an invention is described which is intended to accomplish the same purpose by an array of devices, which, while it might produce the result, is notwithstanding, too complicated and difficult to construct and keep in repair to give general satisfaction.

My invention consists in the combination of a cover attached to and operated by the valve which directly controls the admission of steam to the cylinder, with ports, entering

the valve cylinder, in such a way as to furnish, in the manner hereafter described, a cushion of live steam to restrain the valve at the end of the stroke and prevent its slamming.

My said invention is represented in the accompanying drawings as follows: Figure 1, is a longitudinal sectional elevation of my valve, with a portion of the cylinder and concomitant parts. Fig. 2, is a transverse sectional elevation of the valve. Fig. 3, is a plan. The parts are shown in a central position.

A is the cylinder of the engine, which is made in the usual manner with steam passages *a, a'*, and exhaust *b*, as shown.

B is the piston.

C is the valve, which by being operated as hereafter described, controls the admission of the steam to the cylinder A to act upon the piston. This valve is in most respects constructed very much like that of Mr. Fletcher described in his patent of September, 1857, above referred to.

D, D', are the pistons against which steam is admitted to move the valve C; E, E', are the cylinders in which these pistons operate; *e, e'*, are the passages through which the steam to operate the pistons D, D', is admitted into the cylinders E, E'; F is a valve, by the operation of which this admission of steam is controlled.

So far the apparatus does not essentially differ from what had been known and used before. To prevent however the valve C from slamming at the ends of its stroke, I make small passages *f, f'*, into the cylinders E, E', and so arrange these passages in connection with the cover G which is operated by the valve C, (it being for that purpose supported in a recess in or on lugs which form a part of the side pieces H which connect the parts of the valve C) that as the valve C approaches the end of its stroke, the passages *f, f'* are opened to admit steam upon the valve piston D or D', whichever may be advancing, and this cushion acts in such a manner as to prevent the valve from slamming.

An inspection of the drawings will give a very clear idea of the construction of the parts and their operation. It will be observed that as the receding piston D or D' approaches its limit of travel, it opens the exhaust port *g* or *g'*, which is connected

with the main exhaust *b* by the exhaust *h*, thus allowing steam to escape from the receding piston sufficiently to relieve it from heavy pressure, though the exhaust ports  
5 *g*, *g'*, are, as a matter of economy, made small. The exhaust *h* receives steam through the valve *F*, from the cylinders *E*, *E'*. *I* is the piston rod, which operates the valve *F*.

By the arrangement above described, the  
10 slamming of the valve is effectually prevented, and the operation of the parts rendered smooth and easy.

Having thus fully described my said invention, I wish it distinctly understood that  
15 I do not claim the prevention of the slamming of the valve without reference to the

means by which such result is accomplished. Neither do I claim broadly the interposition of a steam cushion to check the motion of the valve.

The particular improvement which constitutes my said invention and which I claim as having been originally and first invented by me is—

The combination of the steam ports *f*, *f'*,  
25 with the cover *G*, operated by the action of the valve *C*, substantially as described for the purpose set forth.

WM. SHEPHERD, JR.

Witnesses:

JOHN CRUMLY,  
THOS. P. HOW.