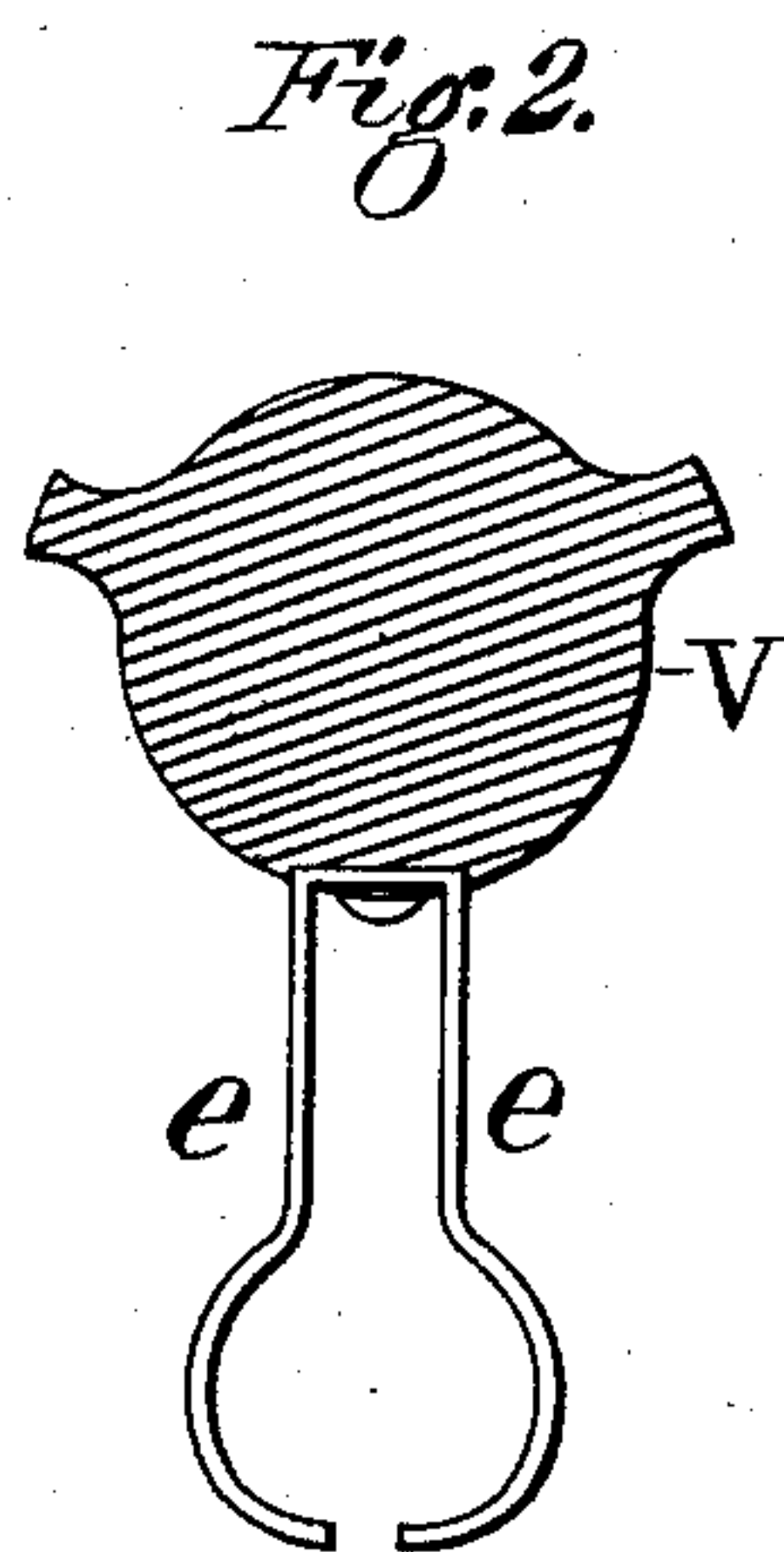
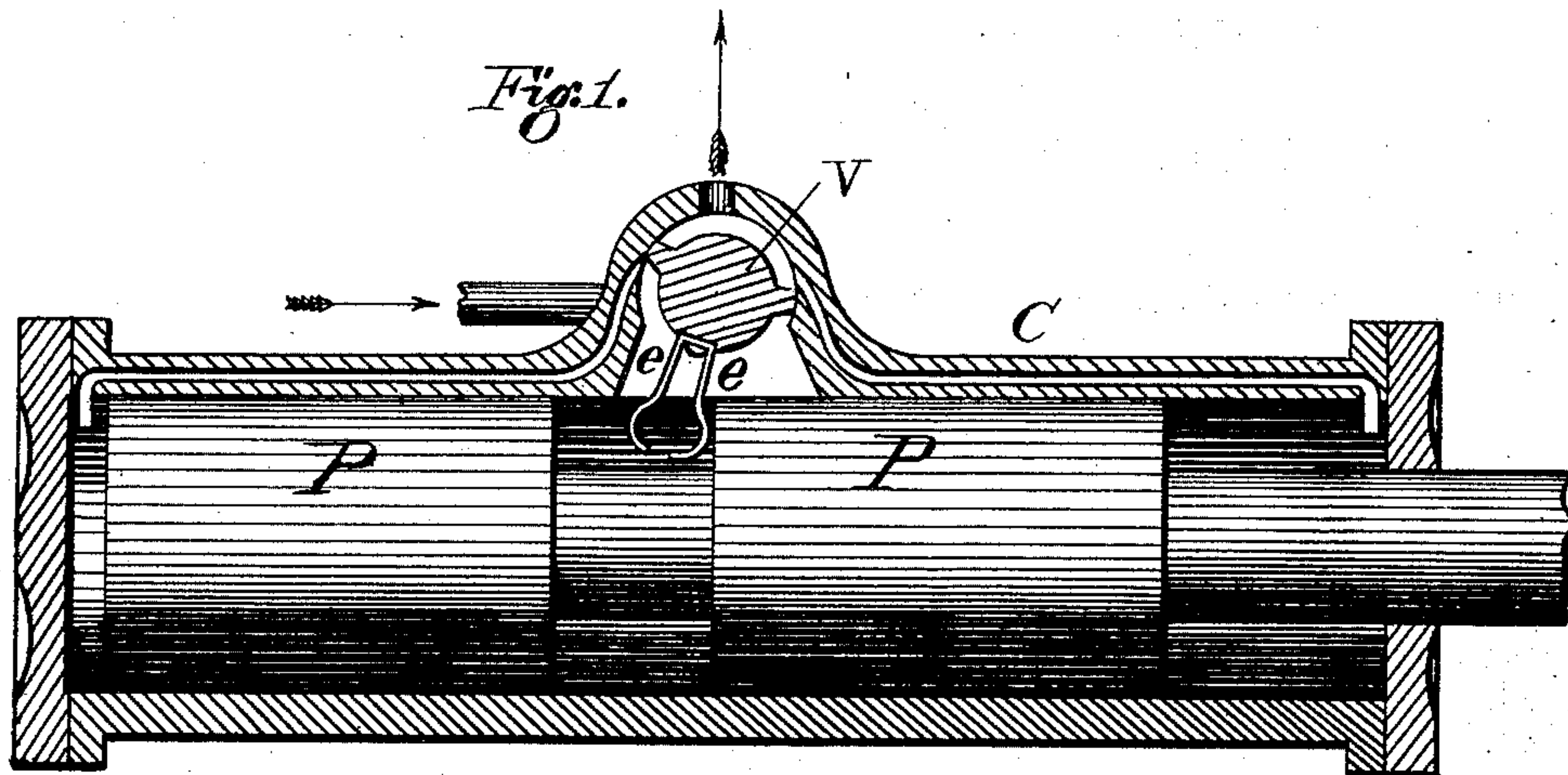


**E. S. WINCHESTER.**  
**Valves for Steam-Engines.**

No. 156,196.

Patented Oct. 20, 1874.



Witnesses:  
Will H. Dodge  
J. J. Boland

Inventor:  
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Attys.

# UNITED STATES PATENT OFFICE.

EDWARD S. WINCHESTER, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **156,196**, dated October 20, 1874; application filed September 5, 1874.

*To all whom it may concern:*

Be it known that I, EDWARD S. WINCHESTER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Valves for Steam-Engines, of which the following is a specification:

My invention relates to the valves of steam or similar engines; and consists in providing the valve with an elastic or spring arm or lever for operating the same, whereby the injury arising from the concussion or jar of the parts is obviated, as hereinafter more fully set forth.

Figure 1 is a side elevation of a cylinder with its valve and piston shown in position, the two former being shown in section. Fig. 2 is an enlarged view of the valve detached.

In rock-drills, steam-hammers, and similar engines it is desired to operate them at a high speed; and in such cases it has been found that the concussion and jar incident thereto tends to disintegrate the metal of the moving parts, besides subjecting them to rapid wear. In order to remedy this and secure a more smooth and easy working of the parts is the object of my present invention.

In the drawings, C indicates the cylinder, P the piston, and V the valve, of an engine such as is used for rock-drills. The valve, in this case, is an oscillating one, and is operated by direct contact of its arm or lever with the piston, as shown in Fig. 1. This arm or lever I make of two spring-bars, *e e*, both being rigidly connected to the valve P, and of suitable length to reach down into the annular recess at the center of the piston. The free or lower ends of these spring-arms *e* are curved or rounded, so as to present a fair bearing against

the shoulder of the piston in whatever position the valve may be, and so as to produce a rolling rather than a sliding motion when the parts come in contact. The extreme ends of these spring-arms are curved inward, and are directly opposite each other, but a little distance apart, as represented in Fig. 2, by which it will be seen that, when the piston first comes in contact with one of the arms, it may yield a little, at the same time exerting a force tending to start the valve, and when it has moved a distance equal to the space between the ends of the two arms it will come in contact with the other arm, when the force will be transmitted through both together. It will thus be seen that the valve is started and stopped with much less of the jar or concussion than it would have if operated by a rigid instead of a yielding or spring arm.

Having thus described my invention, what I claim is—

1. An oscillating valve provided with an elastic arm, constructed to operate substantially as described.

2. The oscillating valve V, provided with the spring arm or lever composed of the two arms *e e*, constructed to operate substantially as set forth, whereby the two shall come into operation successively, as described.

3. The combination of a semi-rotating valve, provided with an elastic stem, and a piston having a recess for the reception of the end of the valve-stem, substantially as shown and described.

EDWARD S. WINCHESTER.

Witnesses:

ALFRED WATTS,  
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