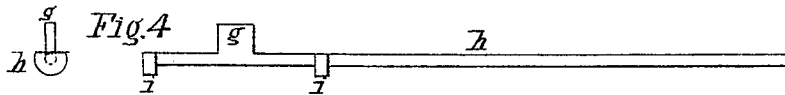
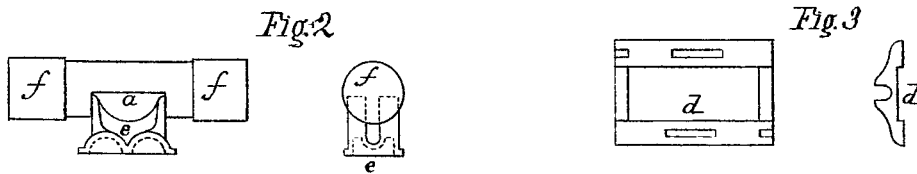
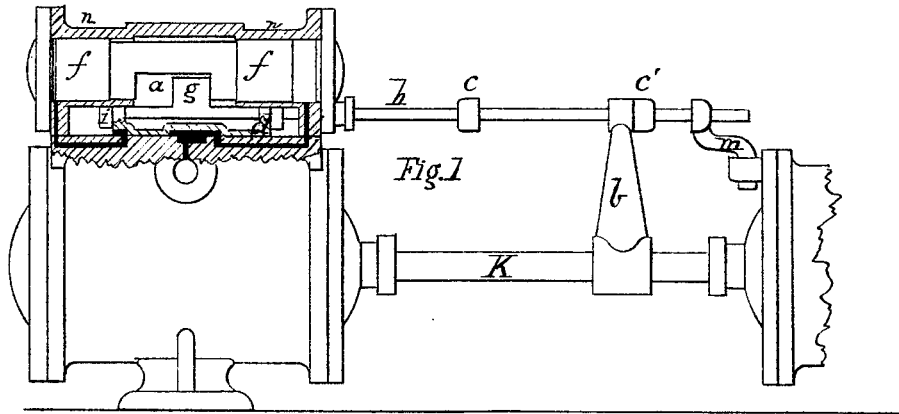


C. P. DEANE.

VALVES FOR DIRECT ACTING ENGINES.

No. 183,839.

Patented Oct. 31, 1876.



Witnesses.
Geo. W. Drane
W. A. Castle

Inventor.
Charles P. Deane.

UNITED STATES PATENT OFFICE.

CHARLES P. DEANE, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN VALVES FOR DIRECT-ACTING ENGINES.

Specification forming part of Letters Patent No. **183,839**, dated October 31, 1876; application filed January 7, 1876.

To all whom it may concern:

Be it known that I, CHARLES P. DEANE, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Direct-Acting Steam-Engines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and the letters of reference thereon.

Figure 1 of the drawings is a longitudinal elevation, with parts in section, of the improved engine. Fig. 2 gives a longitudinal and an end view of the secondary piston with the valve (not shown in Fig. 1) attached. Fig. 3 gives the face and an end view of the secondary valve. Fig. 4 gives a longitudinal and an end view of the valve-rod, with its collars or tappets and a lug attached.

My invention consists in a new, simple, and compact arrangement for effecting the necessary connection of the rod of the secondary valve with the secondary piston in engines where said piston is designed to be moved mechanically, by means of said rod, when failing to be duly and promptly moved by steam under the operation of its valve, said arrangement consisting substantially of a lug forged upon the valve-rod, and working—through an opening in the secondary cylinder—in a slot or cavity in the secondary piston, so as to move said piston contingently, as stated, the rod being supported and guided, as hereinafter described.

To enable others skilled in the art to make and use my invention, I will now describe its construction and operation.

By reference to the drawings it will be seen that the rod *h*, attached to the secondary valve *d*, is firmly guided from above by sliding in contact with the cylinder *n*, while it is sup-

ported and guided from below, and laterally by a recessed bed in the top of the main valve *e*, in which it nevertheless moves freely and independently.

In Fig. 1 of the drawings the main piston of the engine is supposed to have passed very near to the end of its stroke to the right, and through piston-rod *K*, tappet-arm *b*, tappet *c'*, and valve-rod *h*, to have moved the secondary valve *d* to the right, so as to reverse its ports, and admit steam to the left, and exhaust it from the right of piston *f* in cylinder *n*, whereby said piston should have been moved instantly to the right, carrying with it the main valve *e*, attached thereto, as seen in Fig. 2, and thus reversing the main engine; but it is supposed to have failed to be thus moved promptly under the operation of its valve. Now, it will readily be seen that the lug *g*, which I attach to the rod *h* beneath the cylinder *n*, and extend through an opening in said cylinder into a slot or recess, *a*, which I construct in said cylinder, has, by the supposed movement of said rod, been brought just to the end of said slot, and will, therefore, immediately strike said piston, and thus move it to the right mechanically, as stated.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

The arrangement, with the piston *f* and its cylinder *n*, of the lug *g*, said lug being attached directly to a single reciprocating rod, *h*, guided as described, and being extended through an opening in said cylinder into a slot or recess, *a*, in said piston, in the manner and for the purpose described.

CHARLES P. DEANE.

Witnesses:

GEO. W. DEANE,
T. M. BROWN.