# W. WRIGHT.

## Valve for Compound Engines.

No. 162,513. Patented April 27, 1875.

Fig. 1.

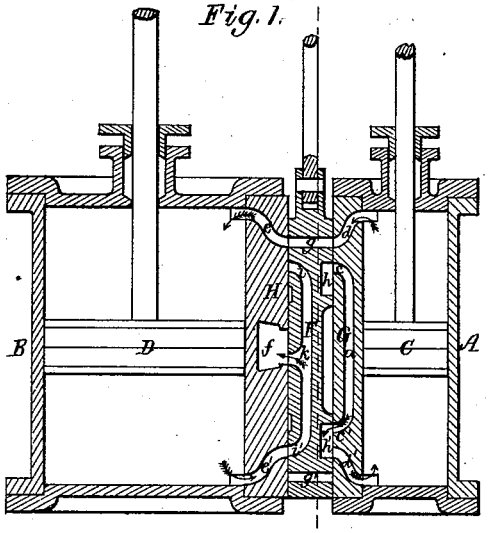



Fig. 2.

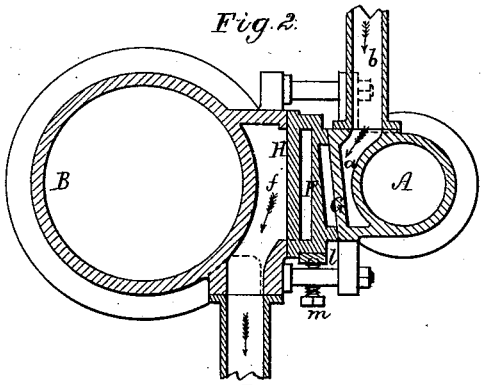
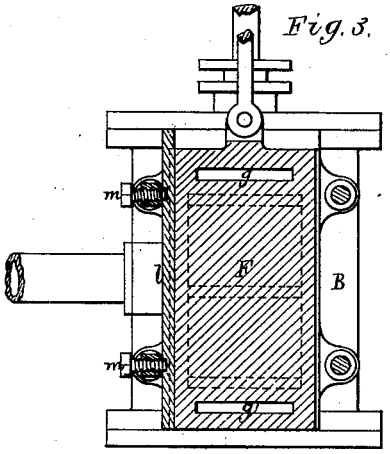



Fig. 3.




Witnesses
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# UNITED STATES PATENT OFFICE.

WALTER WRIGHT, OF TAPLEYVILLE, MASSACHUSETTS.

## IMPROVEMENT IN VALVES FOR COMPOUND ENGINES.

Specification forming part of Letters Patent No. **162,513**, dated April 27, 1875; application filed March 24, 1875.

*To all whom it may concern:*

Be it known that I, WALTER WRIGHT, of Tapleyville, (Danvers Centre,) of the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Steam-Engines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a longitudinal section, and Fig. 2 a transverse section, of a double-cylinder engine with my invention, which relates to the valve for supplying steam to and discharging it from the main cylinder, and into and from the larger or expansive cylinder, such valve, as represented, being wedge-shaped in transverse section, and to operate with seats out of parallelism.

My invention further relates to a peculiar combination of two cylinders, and a duplex-faced valve, to operate as hereinafter described. Also, to a combination of a bearing or support rail and adjusting-screws with the wedge-shaped valve and the two cylinders, arranged in manner and to operate substantially as hereinafter explained.

In the drawings, A denotes the main or lesser cylinder, and B the larger or expansive one, C being the piston of the former, and D that of the latter. The valve shown at F is arranged between the two cylinders, or their valve-seats G H. The faces of both seats are plane surfaces, one being out of parallelism with or inclined to the other transversely, as shown in Fig. 2.

In Fig. 2, *b* represents the steam-induct pipe leading into a steam-chamber, *a*, arranged at one side of the cylinder A, in manner as indicated in the figures. This chamber opens through the next adjacent seat of the valve, as seen at *c c'*, and between two ports, *d d'*, leading through such seat from the ends of the cylinder A. The cylinder B is also provided with similar end ports *e e'*, and an intermediate discharge or waste steam passage, *f*, all being arranged with it and its valve-seat in manner as represented. The valve F has two passages, *g g'*, leading transversely through it, as shown. In its face, next to the cylinder A, such valve has two open chambers, *h h'*, and, furthermore, it has in the opposite face three ports, *i i' k*, connected and arranged as represented. The said valve rests and slides on or against a rail or bar, *l*, supported on adjusting-screws *m m*, (see Fig. 3,) which is a longitudinal section taken through the valve.

As the bearing-surfaces of the valve and its seats may become worn from time to time, the valve may be forced up to them by setting up the screws. If desirable, the valve may be provided with friction-rollers to rest and run on the rail *l*.

In the operation of this engine the valve is first to be moved, so as to bring the chamber *h'* in communication with the ports *c'* and *d'*, in which case the ports *d*, *g*, and *e* will be in communication. The port *e'* will also be open into the port *i*, and the port *k* will also open into the exhaust-passage *f*. Steam will then be flowing into the cylinder A at one end, so as to move its piston, and force the steam through the ports *d*, *g*, and *e* into the auxiliary or expansive cylinder B. This steam will move the piston D of said cylinder B, and expel the exhaust steam through the ports *e'*, *i'*, and *k*. On moving the valve, so as to bring the ports *e'*, *g'*, and *d'* into communication, the chamber *h* will be put in communication with the ports *c* and *d*, and the port *e* will open into port *i*. Under this state of things the piston C will be forced in the opposite direction, and the waste steam will be driven into the larger cylinder D, whereby its piston will be moved the opposite way from what it was before, and the exhaust steam of said cylinder D will be expelled by the ports *e*, *i*, and *k*.

The valve and its seats may have their rubbing-surfaces parallel, and be provided with ports and chambers arranged as represented, and still make, with the other ports, a good engine, provided one cylinder be movable toward the other, or the two be connected by screw-bolts and nuts, arranged as shown in Fig. 2. It being, however, far better to have the wedge-shaped valve, owing to the greater facility with which the wearing-surfaces of it and its seats may be brought in close contact, I prefer to use such a valve.

I claim—

1. In combination with the two cylinders A B, arranged and provided with inlet and outlet passages and ports *a*, *c c'*, *d d'*, *e*, *f*, and *e'*,

as described, a duplex-seated parallel-faced valve, F, arranged between such two cylinders, and provided with the open chambers *h h'*, the transverse passages *g g'*, and the connected ports *i k i'*, all being to operate as specified.

2. The combination of the bearing or support rail *l* and its adjusting-screws *m* with the wedge-shaped valve F and the two cylinders A B, arranged and constructed substantially as specified.

WALTER WRIGHT.

Witnesses:
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