(Model.) 2 Sheets—Sheet 1.

W. D. HOOKER.

STEAM ACTUATED VALVE.

No. 262,227. Patented Aug. 8, 1882.

Fig. 1.

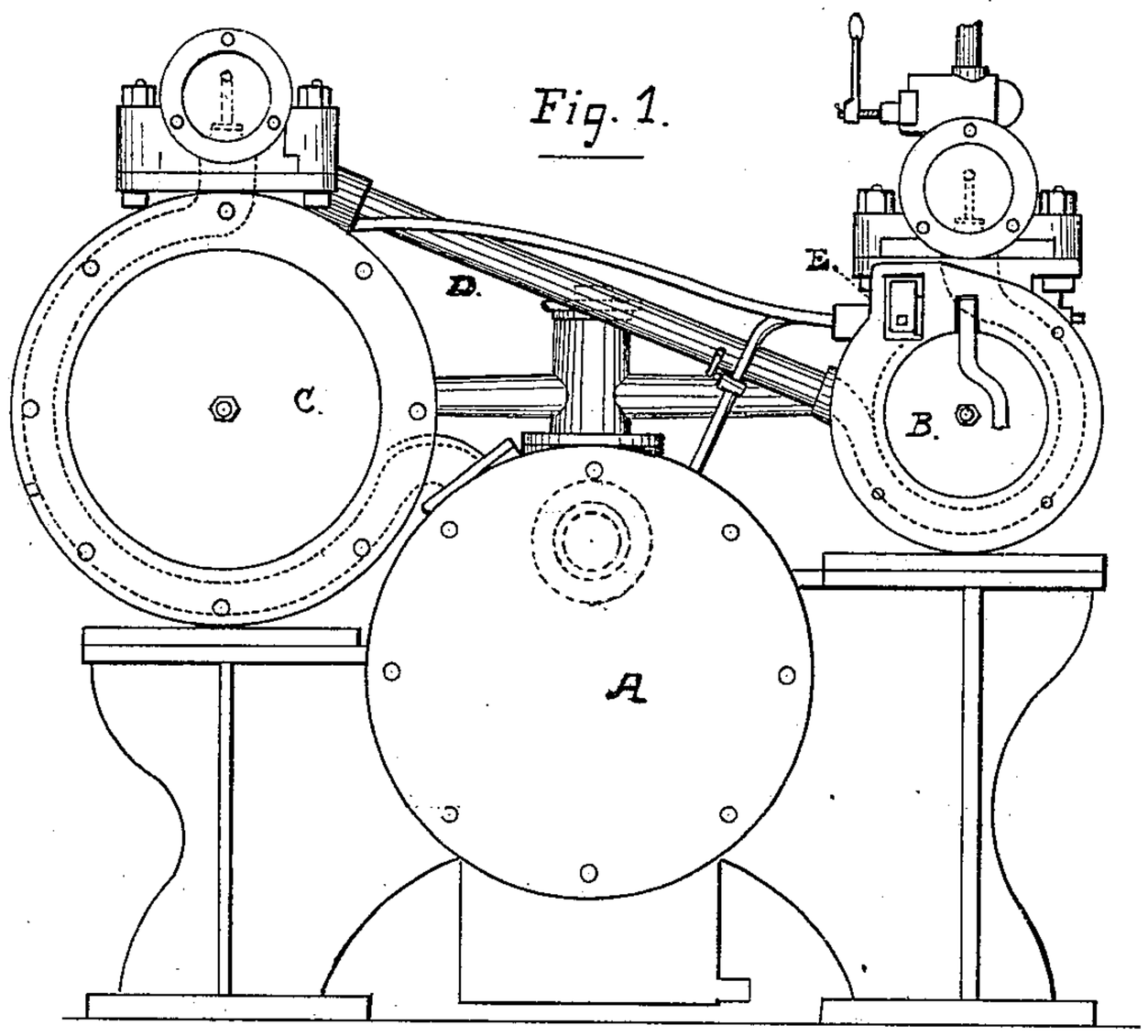
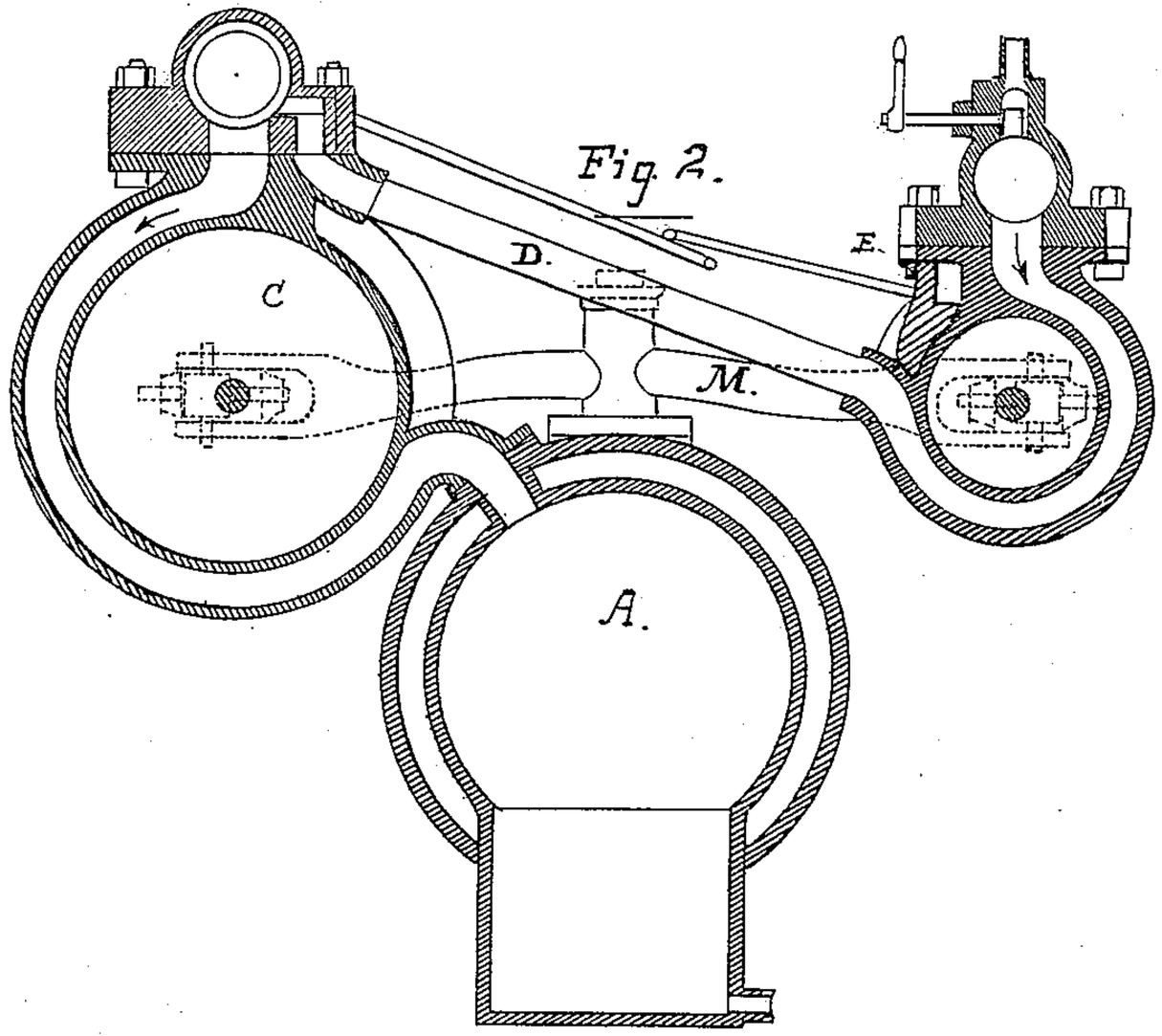


Fig. 2.



Witnesses:

W. Voit.

W. A. Clark

Inventor:

William D. Hooker

by his Attys.,

Boone & Gibson

N. PETERS. Photo-Lithographer. Washington. D. C.

(Model.) 2 Sheets—Sheet 2.

W. D. HOOKER.

STEAM ACTUATED VALVE.

No. 262,227. Patented Aug. 8, 1882.

Fig. 3.

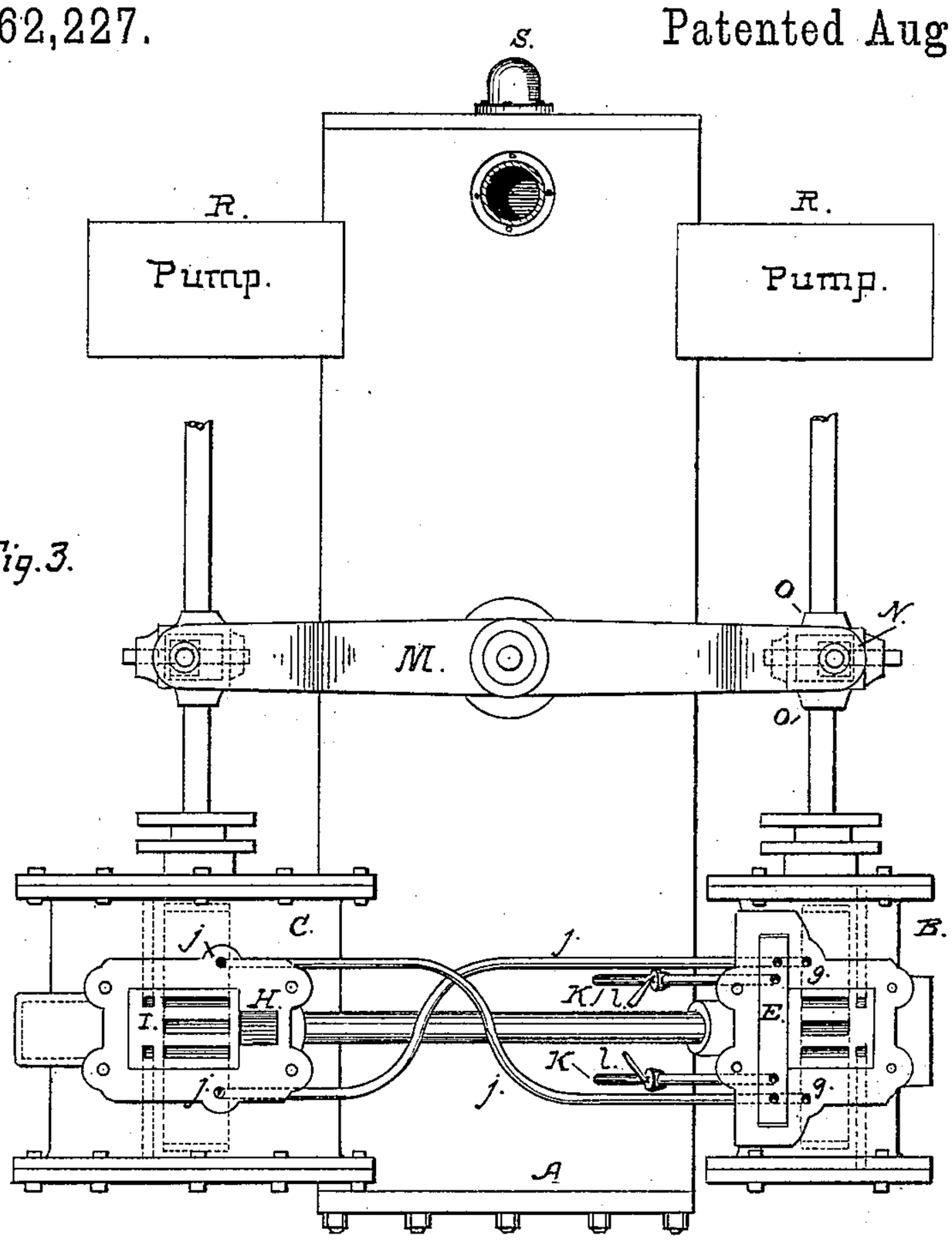


Fig. 5.

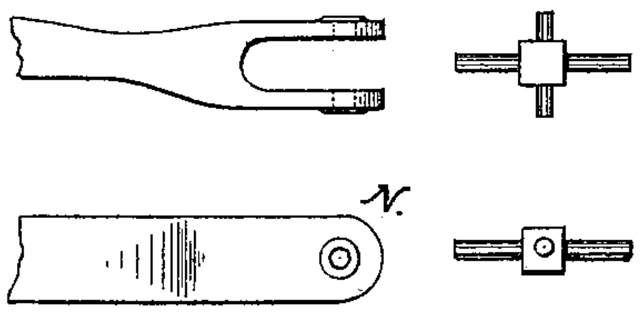
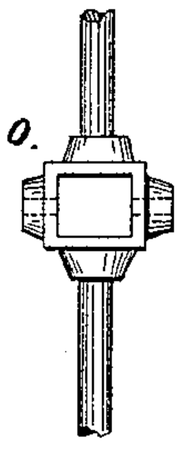


Fig. 4.



Witnesses:

W. Voit.

W. A. Clark

Inventor:

William D. Hooker

by his Attys.,

Boone & Osborn

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM D. HOOKER, OF OAKLAND, CALIFORNIA.

STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 262,227, dated August 8, 1882.

Application filed June 1, 1881. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM D. HOOKER, of Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Steam-Actuated Valves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My improvements in steam actuated valves consist, first, in the employment of a single auxiliary valve for supplying steam to move the main valves of all the engines; secondly, in exhausting directly from the chamber at each end of the supplemental piston that moves the main valve into the condenser through a separate and independent pipe, port, or passage, so as to obtain the free action of the vacuum in the condenser to aid in moving the supplemental piston that carries the main valve.

In the drawings I have represented the engines mounted upon the condenser; but this, in connection with an arrangement of pumps to form a pumping-engine, I shall make the subject of a separate application for a patent.

Referring to the accompanying drawings, Figure 1 is an end elevation, showing the condenser and the single high and low pressure engine combined together. Fig. 2 is a cross-section taken vertically through the center of the engine. Fig. 3 is a top view. Figs. 4 and 5 show parts in detail.

Let A represent a condenser having a high-pressure engine, B, and a low-pressure engine, C, mounted upon it at or near one end. I prefer to mount these engines on opposite sides of the condenser; but if a single condensing-engine is used it can be mounted directly upon it or otherwise.

The exhaust-port of the engine B, I connect with the steam chest of the low-pressure engine C by a pipe or other passage, D, which, as herein represented, passes across above the condenser, while the exhaust-port of the low-pressure engine C is connected with the interior of the condenser.

E is the auxiliary valve, which supplies steam to move the supplemental piston that carries the main valve of the high-pressure engine B, and which may be moved by the main piston of the engine acting against tappets *f* in the main cylinder, as described in my Letters Patent on "direct-acting engines," No. 109,104, dated December 6, 1870, or in any other approved way. Steam is admitted by this auxiliary valve through the ports *g g* to each end alternately of the chamber in which the supplemental piston moves, so as to drive the supplemental piston, while the main valve, which supplies steam to move the main piston, is carried by this supplemental piston.

The low-pressure engine C, I do not provide with any auxiliary valve, but I provide it with a supplemental piston-chamber, H, and supplemental piston, which carries a main valve, I, in the same way as hereinbefore described for the high-pressure engine. A very suitable arrangement for admitting the steam to drive and cushion the supplemental piston is shown in my Letters Patent dated December 18, 1868; but I do not confine myself to any specific arrangement for this purpose. I then connect the supplemental piston-chamber H with the same auxiliary valve-chamber, E, that supplies steam to move the supplemental piston and main valve of the high-pressure engine by means of pipes, ports, or passages *j j*, so that the same auxiliary valve supplies steam to move the main valves of both engines. If the pistons of the engines are to be moved in opposite directions, I cross the pipes, ports, or passages *j j*, as represented in the drawings, so that the steam is delivered simultaneously at the opposite ends of the supplemental piston-chambers of the two engines. This arrangement insures a simultaneous action of the valves in the two engines, so that the exhaust-steam from the high-pressure engine passes directly into the cylinder of the low-pressure engine at the same time that the exhaust that connects the low-pressure engine with the condenser is opened, thus causing the vacuum in the condenser to aid in moving the main piston.

K K are the pipes, ports, or passages which connect the condenser with the exhaust-passages that lead from the ends of the supplemental piston-chamber through the auxiliary valve-chamber. Heretofore these exhaust-passages have always been connected with the main exhaust from the engine before they reached the condenser, so that the vacuum in the condenser had little effect in aiding to move the supplemental piston and main valve, owing

to the back-pressure of the steam in the main exhaust-passage. By my arrangement, however, I connect these ports or passages directly with the condenser. This arrangement simplifies the compound condensing-engine and renders it much more effective than heretofore.

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

1. The combination, with one prime auxiliary-valved direct-acting engine, of one or more secondary engines having no auxiliary valves, so that the steam supplied by the auxiliary-valved engine shall drive simultaneously the valves of all the secondary engines, substantially as shown and described, and for the purpose set forth.

2. An auxiliary-valved engine adapted to supply steam to drive simultaneously the main valves of all the secondary engines, substantially as shown and described.

3. The combination, with an auxiliary-valved engine and an engine or engines having no auxiliary valves, of the pipes or passages connecting the engines with the condenser controlled by the auxiliary valve, substantially as set forth.

In witness whereof I have hereunto set my hand and seal.

WILLIAM DAVIS HOOKER. [L. S.]

Witnesses:
EDWARD E. OSBORN,
W. F. CLARK.