

J. S. SHAPTER.
CUT-OFF MOTION.

No. 14,699.

Patented Apr. 15, 1856.

Fig. 1.

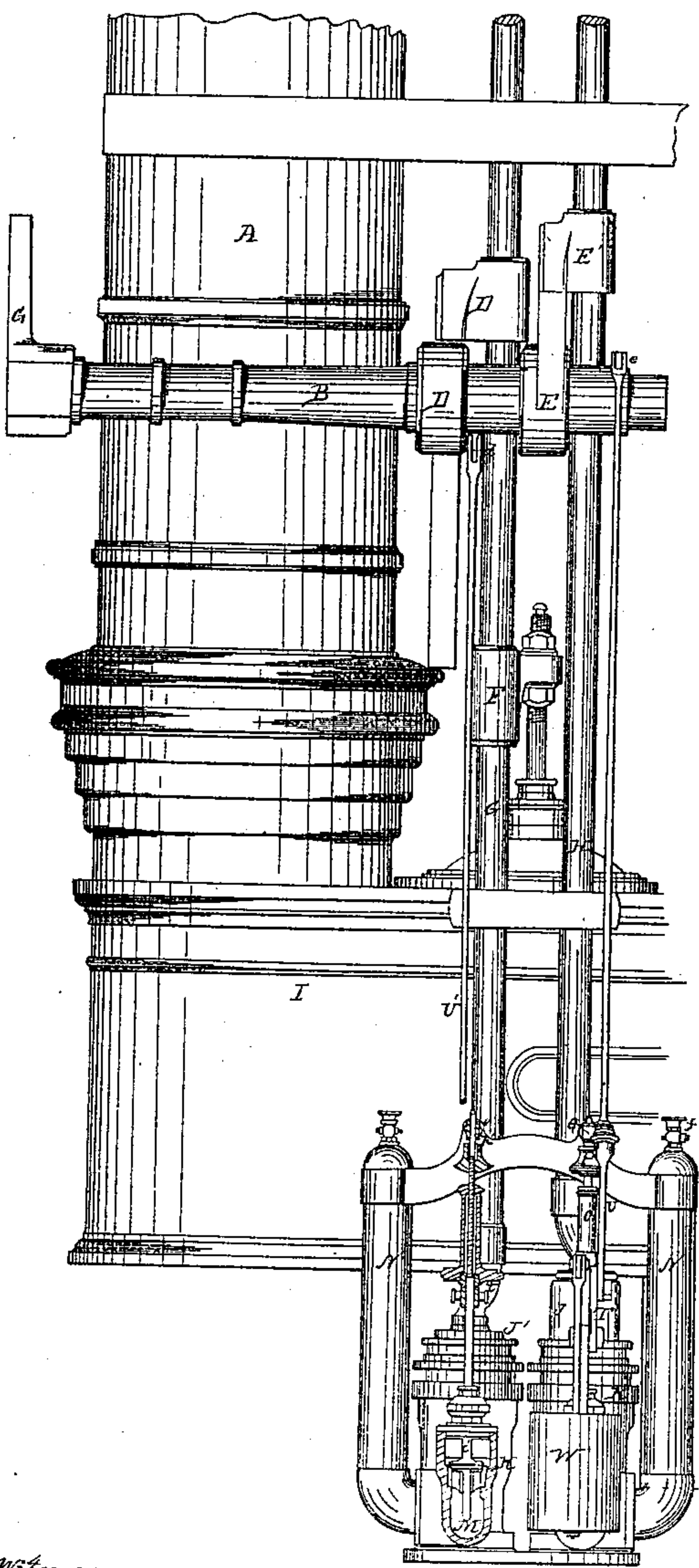
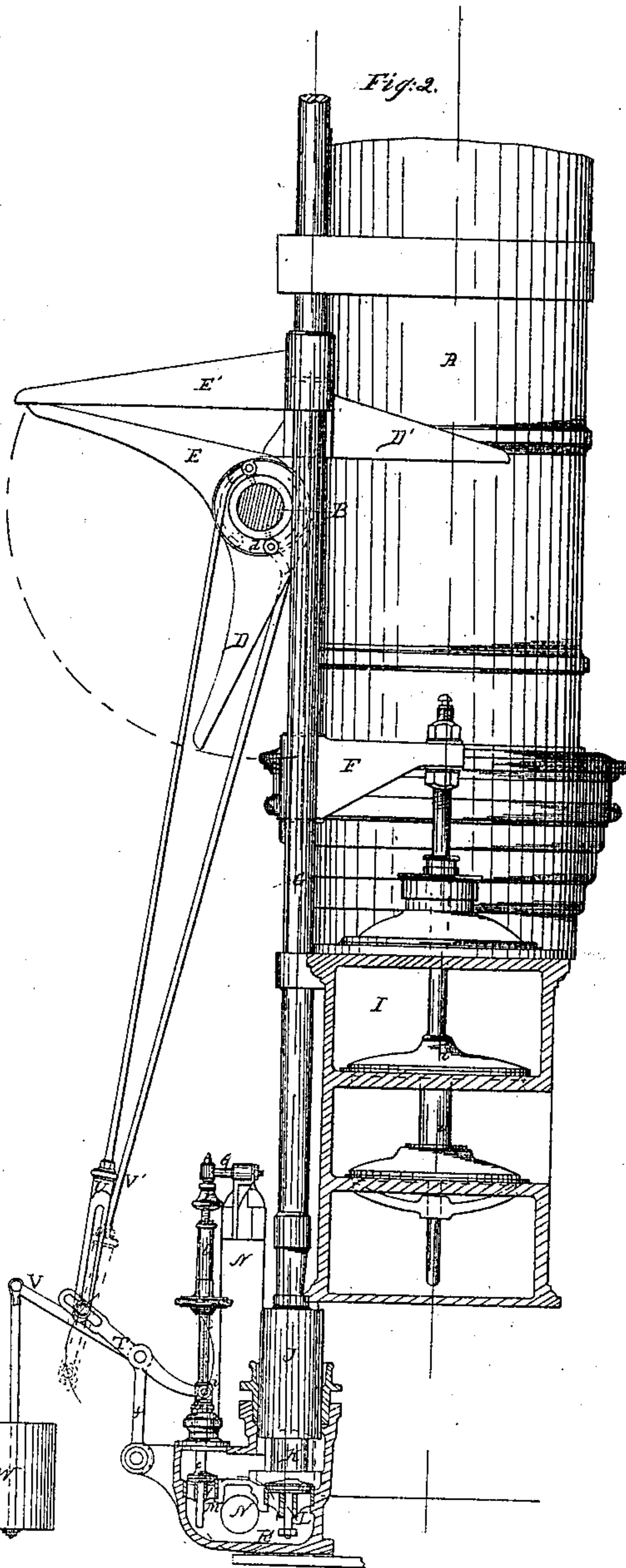


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN S. SHAPTER, OF NEW YORK, N. Y.

CUT-OFF FOR STEAM-ENGINES.

Specification of Letters Patent No. 14,699, dated April 15, 1856.

To all whom it may concern:

Be it known that I, JOHN S. SHAPTER, of the city, county, and State of New York, have invented a new and useful Improvement for Operating Cut-Off Valves of Steam-Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The nature of my invention relates to governing the time of closing the steam valves of that class of steam engine in which puppet-valves are used, by the release of a fluid from a tight compartment at such period of the duration of the stroke of the piston of the engine as may be required—the time of closing the valves and making them cut off the supply of steam to the cylinder being adjustable by the engineer while the engine is in motion.

Figure 1 in the annexed drawings represents a front view of my improvement as attached to the steam valves of the lower end of a cylinder. Fig. 2 is a vertical section through the steam chest and supporting chamber.

A represents one of the side pipes of an upright engine; B, the rock-shaft to raise the steam valves by the toes D, E on it, and the lifters D' E' on the lift-rods G, H; I, lower steam chest—*i i'*, double or balanced puppet steam valves; J, plunger attached to the end of the lift rod G and working in the supporting chamber K through a packed stuffing box; N, reservoir containing the requisite supply of oil or other fluid, which is carried into the supporting chamber K through the valve L on the raising of the lift-rod G and its attached plunger J; M, discharge valve to the chamber K, the opening of which, to discharge the fluid contained in the chamber, controls the dropping of the steam valve and the cutting off of the supply of steam to the cylinder; *c*, stem attached to the top of the discharge valve and running up (through a packed stuffing box in the top of the chamber K) into the steadiment Q; P, gage nut to adjust the amount of lift given to the discharge valve when once placed so as to permit the steam valve to return to its seat without concussion or slam, it requires no future alteration; O, adjustable nut, working up or down on the valve stem *c* in a screw thread, by which the time of lifting the discharge

valve is governed; *i''*, thimble, working loosely upon the stem of the discharge valve and attached to the end of the lever T—this lever is supported by, and works upon, the standard S which is made to vibrate so as to allow the end to which the thimble *i''* is attached to work up and down in a vertical line; V, an arm, fastened to the same shaft with the lever T, for the purpose of holding the weight W; U, connecting rod, jointed at one end to the rock shaft B, and having an open link (sliding on a pin in the arm T) at the opposite end which can be raised or lowered on it to its proper position. The toes D, E are placed upon the rock shaft at such divergence from a right line as to permit the lifters D' E' to be raised by them the full height of the lift required to be given to the valves and leave them at an early period of the stroke of the piston.

The attachment to work the upper steam valves are an exact counterpart of those herein described for working the lower ones, except that the rod U' is attached to, and works from, the opposite side of the rock shaft B.

The operation of my improvement is as follows—on the lower steam valves being raised by the rock shaft, the plunger J attached to the bottom end of the lift rod G raises the valve L, and allows the fluid (which I prefer to be a mixture of linseed oil and alcohol) to fill the supporting chamber K—the dropping of the toe E from the lift B' leaves the lift rod held up by the incompressibility of the fluid—the turning of the rock shaft drops down the connecting rod U and with it the levers T and V and the weight W—the thimble *i''* on the end of the lever T striking the adjustable nut O and raising the discharge valve M, allows the fluid contained in the supporting chamber to be discharged back into the reservoir N and the lift rod G and the steam valve *i i'* to drop back into their seats. As soon as the thimble *i''* raises the discharge valve M its given height, the weight W is upheld by the nut P striking the steadiment Q, and the link in the end of the rod U slips on the pin in the arm T until the motion of the rock shaft is reversed, and the link catches the pin and raises the lever T disengaging the thimble *i''* from its contact with the nut O, and allowing the discharge valve M to return to its seat by the weight of it and its attachments.

The position of the adjustable nut O on the stem of the discharge valve regulates the time of opening of the discharge valve M and through that the period of cutting
5 off the entrance of the steam to the cylinder—as the steam follows the piston further, from the valves closing lever, when it is screwed up toward the top of the stem, and less, from the valves closing sooner, when it
10 is screwed down, either of which result can be attained by the engineer while the engine is in motion.

The reverse motion of the rock shaft B operates upon the upper steam valves in
15 the same manner as herein described for the lower ones.

What I claim as my improvement and invention and desire to secure by Letters Patent is—

Holding up the puppet steam valves of
a steam engine by the fluid contained in a
supporting chamber and adjusting the discharge of said fluid from said chamber for
the purpose of dropping said steam valves
and cutting off the supply of steam to the
cylinder at different points as may be re-
quired, as herein set forth.

JOHN S. SHAPTER.

Witnesses:

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FRANCIS S. LOW.