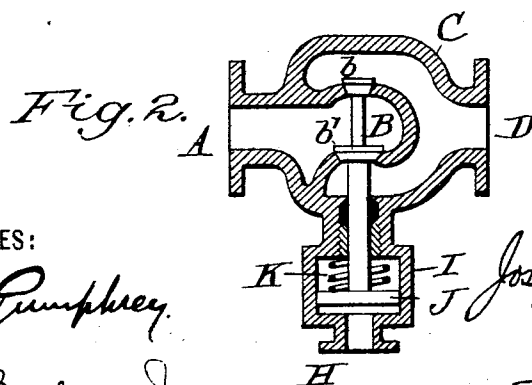
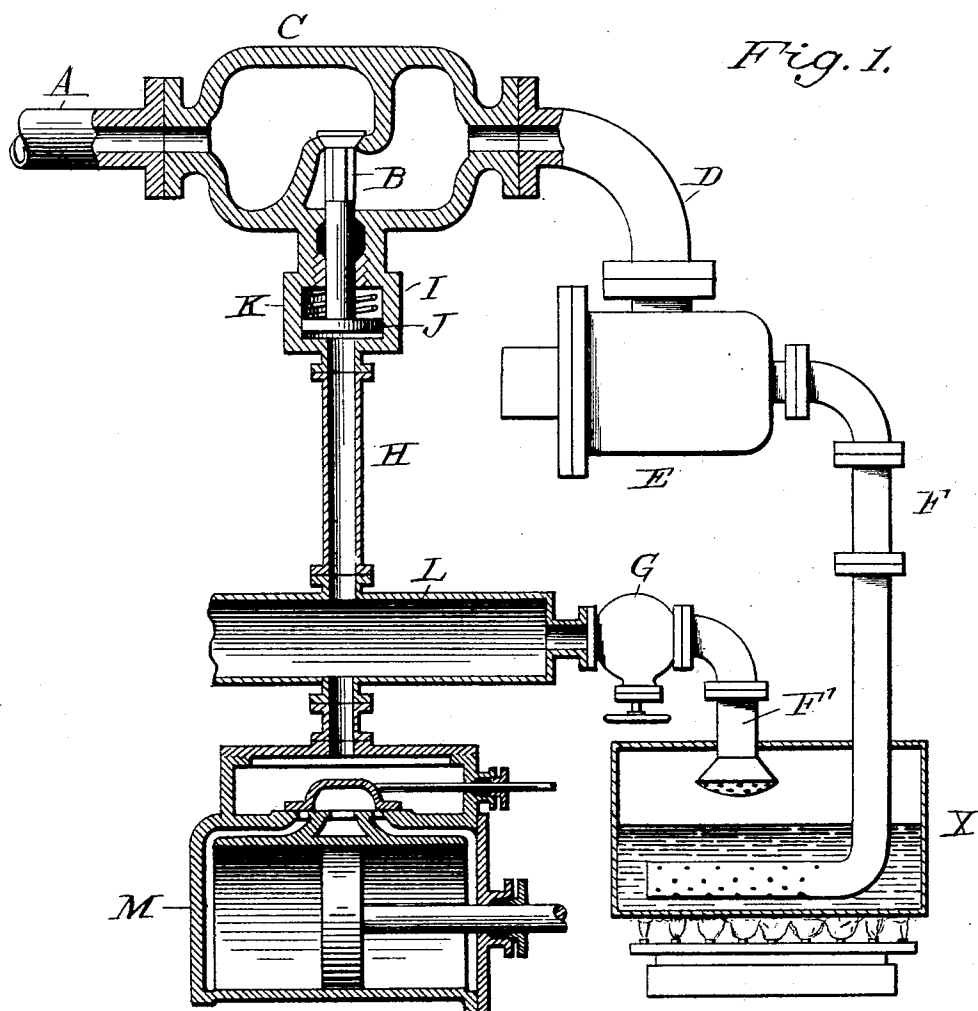


(No Model.)

J. H. HOADLEY & W. H. KNIGHT.
STOP VALVE.

No. 586,235.

Patented July 13, 1897.



WITNESSES:

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JOSEPH H. HOADLEY, OF NEW YORK, AND WALTER H. KNIGHT, OF NEW BRIGHTON, NEW YORK.

STOP-VALVE.

SPECIFICATION forming part of Letters Patent No. 586,235, dated July 13, 1897.

Application filed July 27, 1896. Serial No. 600,592. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH H. HOADLEY, residing in New York city and county, and WALTER H. KNIGHT, residing in New Brighton, Richmond county, State of New York, citizens of the United States, have invented a new and useful Improvement in Stop-Valves, of which the following is a specification.

Our invention relates to the stop-valve to be used in connection with fluid-pressure engines deriving their power from a source of fluid-pressure under a high state of compression. With such engines a reducing-valve is used between the source of high pressure and the engine to reduce the original pressure down to such a pressure as the engine is adapted to use. Such reducing-valves being automatic, and consequently more or less delicate and sensitive, are liable at times to leak when they are supposed to be closed, thus entailing a loss of the fluid under pressure. It is generally found necessary to protect such valves by a positive stop-valve located between the reducing-valve and the source of pressure and closed by hand when the engine is shut down.

In our invention we provide a stop-valve which is held closed by the high pressure and opened by the low pressure which is admitted to it from a hot-water heater when the throttle-valve of the engine is opened, so that when the engine is running the stop-valve will be opened and held open as long as the engine is working, and when the engine is stopped by the closing of the throttle-valve the stop-valve will automatically close, because of the shutting off of the low pressure. To aid in this self-closing, we apply a spring to the stop-valve, acting in the same direction as the high pressure.

In the accompanying drawings, Figure 1 represents in section an apparatus embodying our invention, and Fig. 2 is a similar sectional view of a modified form of the valve.

A is a pipe leading from the high-pressure reservoir.

B is a stop-valve located in valve-chamber C.

D is a passage from the stop-valve chamber to reducing-valve E, and F is a low-pres-

sure passage leading from reducing-valve to the hot-water heater X. The hot-water heater X is of usual construction, comprising a water-tank with the inlet-pipe F extending into it and dipping beneath the water, the outlet-pipe F' leading from it above the surface of the water, and a gas, oil, or other suitable heater supported beneath for keeping it properly heated.

F' is a fluid-pipe leading from heater X to the engine throttle-valve G.

H is a passage from the fluid-pressure chest L of the engine M to the cylinder I, in which there travels a piston J, connected to the stop-valve B. (The engine is shown merely diagrammatically and at reduced scale.)

K is a spring for forcing the stop-valve to its seat when the throttle-valve G is closed and the pressure is released from passage H through the exhaust of the engine. The heater X supplies pressure for opening the high-pressure stop-valve and also heats the compressed air on its way to the engine-cylinder.

It will be seen that when the throttle-valve G is opened and fluid-pressure in the form of steam is admitted to the fluid-pressure chest L from heater X, (a slight steam-pressure being constantly maintained in the heater by its constantly-burning flame,) the pressure, acting through passage H and chamber I and coming against the large surface of piston J, will force the stop-valve B open against the high pressure, which tends always to hold it to its seat, and also against the tension of the spring K. As long as the engine is working, or, rather, as long as the throttle-valve is open, this stop-valve B will also remain open; but as soon as the throttle-valve is closed and the pressure disappears from chest L the spring, acting together with the pressure of the high-pressure fluid, will force the stop-valve B to its seat, forming a positive check to the escape of any of the high-pressure fluid, even though the reducing-valve E may be leaking.

The stop-valve may be made balanced, as shown in Fig. 2, so that the spring alone will hold it to its seat, or the two parts *b b'* of the balanced valve may be of slightly-different areas, *b'* being the larger, so as to aid the

spring in holding the valve to its seat by just the desired amount of pressure.

Having thus described our invention, the following is what we claim as new therein and
5 desire to secure by Letters Patent:

1. In combination with a source of high pressure, a reducing-valve for lowering the pressure to an apparatus for utilizing the lower pressure, a throttle-valve for controlling the admission of such lowered pressure
10 to the apparatus, and an automatically-closed stop-valve operated by the lowered pressure, when the throttle-valve is opened, to open the passage between the source of high pressure and the reducing-valve, said stop-valve being
15 automatically closed when the said throttle-valve is closed, substantially as set forth.

2. In combination with a consumer of fluid-pressure, such as a fluid-pressure engine, a
20 valve for admitting and shutting off the fluid-pressure to said engine, a source of high pressure, a reducing-valve for reducing such high pressure, an automatic stop-valve located between the source of high pressure and the reducing-valve, said stop-valve being closed and
25 held closed by the high-pressure fluid, and means for automatically opening said stop-valve by the reduced fluid-pressure when the throttle-valve is opened, substantially as set forth.

3. In combination with a consumer of fluid-pressure, such as a fluid-pressure engine, a
30 throttle-valve for admitting or shutting off fluid-pressure to the engine, a source of high pressure, the reducing-valve, a hot-water heater located between the reducing-valve and throttle-valve, a stop-valve between the high-pressure supply and reducing-valve, and
35 means operated by fluid-pressure for automatically opening the stop-valve when the throttle-valve is opened, as set forth.

4. In combination with a source of high pressure, an apparatus for utilizing low pressure, a reducing-valve for lowering the pressure to said apparatus, a throttle-valve for
45 controlling the admission of the low pressure to said apparatus, a hot-water heater located between the reducing-valve and throttle-valve, a stop-valve between the high-pressure supply and reducing-valve, and a fluid-pressure-operated device connected with said stop-valve and communicating with the low-pressure

supply between the throttle-valve and apparatus being operated, substantially as set forth.

5. In combination with a source of high pressure, the stop-valve B, reducing-valve E, throttle-valve G, a low-pressure-supply pipe controlled by the throttle-valve, the passage
60 H, extending from the low-pressure-supply pipe, and a piston J in said passage H operatively connected with the stop-valve B, substantially as set forth.

6. In combination with a source of high pressure, of a balanced stop-valve, a reducing-valve and a throttle-valve, with automatic means for opening the said balanced valve,
65 when the throttle-valve is opened, and automatic means for closing said balanced valve when the throttle-valve is closed, substantially as set forth.

7. The combination of a source of high pressure, a reducing-valve, a hot-water heater, a passage leading from the source of high pressure through the reducing-valve to the
75 hot-water heater, a passage leading from the hot-water heater to an apparatus to be run by the lowered pressure, a throttle-valve in said low-pressure passage, a passage H leading from the low-pressure-supply pipe, a stop-valve in the high-pressure passage between the source of high pressure and reducing-valve, and a piston movably supported in
80 passage H and connected with the stop-valve and adapted to operate it.

8. The combination of a source of high pressure, a reducing-valve, a hot-water heater, a passage leading from the source of high pressure through the reducing-valve to the
90 hot-water heater, a stop-valve in said passage between the source and reducing-valve, a spring for closing said stop-valve, a low-pressure-supply pipe leading from the hot-water heater, a throttle-valve in the low-pressure-supply pipe, a fluid-pressure-operated device
95 in communication with the low-pressure-supply pipe and connected with the stop-valve and adapted to force it open against the action of its spring.

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Witnesses:

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