

No. 746,222.

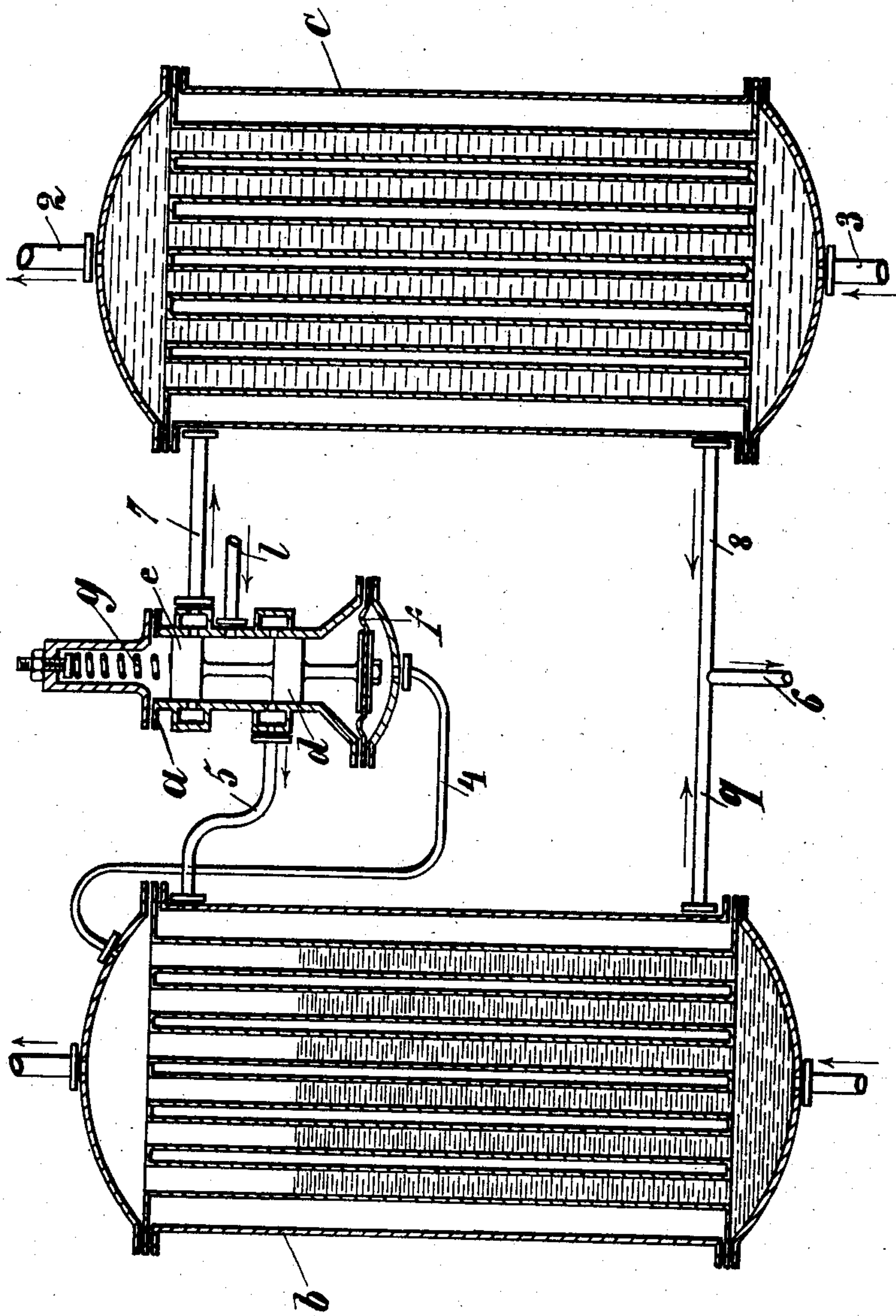
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F. WINDHAUSEN, JR.

PROCESS OF REGULATING THE SUPPLY OF FLUIDS.

APPLICATION FILED JULY 16, 1902.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANZ WINDHAUSEN, JR., OF BERLIN, GERMANY.

PROCESS OF REGULATING THE SUPPLY OF FLUIDS.

SPECIFICATION forming part of Letters Patent No. 746,222, dated December 8, 1903.

Application filed July 16, 1902. Serial No. 115,744. (No specimens.)

To all whom it may concern:

Be it known that I, FRANZ WINDHAUSEN, Jr., engineer, a subject of the King of Prussia, Emperor of Germany, and a resident of No. 1 Corneliusstrasse, Berlin, W., in the Kingdom of Prussia and Empire of Germany, have invented an Improved Process of Regulating the Supply of Fluids, of which the following is a specification.

10 The present invention relates to a process for regulating the flow of waste steam to the vaporizers of cold-steam-power machines.

In a vaporizer of a cold-steam-power engine heated by the waste steam of a steam-engine 15 it may happen that according to load of the steam-engine and the motor heated by the same sometimes more and sometimes less waste steam is conducted to the latter than is necessary for the heating. If now more 20 waste steam is present than is required, then according to the present invention only so much steam shall be conducted to the vaporizer as is required to heat the same and for the attainment of a normal pressure of the 25 produced cold vapors, while the excessive portion of the steam without passing the vaporizer passes through a suitable device into the atmosphere or into a surface or jet condenser and to there give up its heat. The device for 30 leading off the excessive portion of the waste steam may be a valve, a cock, a slide, a throttle-valve, or the like, and should be opened as soon as the pressure of the waste steam or that of the generated working (cold) steam 35 exceeds the normal—that is to say, as soon as more heat flows to the vaporizer than is required or necessary for the normal heating of the same—and should be closed as soon as the pressure of the waste steam or the work- 40 ing steam is less than the normal, as then less heat passes in the waste steam to the vaporizer than the same requires. The opening and closing of the device for conducting away the excessive portion of the waste steam into 45 the atmosphere or into a condenser may be effected by an attendant or operated by a special automatic device.

Reference is to be had to the accompanying drawing, which is a sectional elevation of a 50 plant embodying my invention.

This automatic regulation may, for instance, be carried out by the apparatus *a*, (shown in

the accompanying drawing,) in which the changing pressure of the working steam is employed to effect the opening and closing 55 of the pipes for the excessive waste steam, it being assumed that the waste steam thus cut off passes into a condenser *c*. The waste steam flows through the pipe *l* into the apparatus *a* and can pass from here to the vaporizer *b* of the cold-steam motor, as also to the 60 condenser *c*, in which cooling-water circulates through the pipe 2 and 3. The feed of the waste steam to the vaporizer is, as a rule, open and may be regulated by the slide *d*, 65 while the flow of the waste steam to the condenser *c* is regulated by the slide *e*, which is, as a rule, closed. Both slides are in direct or indirect connection with a membrane *f*, upon the one side of which the pressure of the 70 working vapors generated in *b* acts through the tube 4, the pressure of the working steam upon the membrane being taken up by the adjustable spring *g*.

At the normal pressure of the working 75 steam upon the membrane *f* the slides *d* and *e* take up approximately the normal position shown and the entire quantity of the waste steam flowing through the tube *l* passes through the open slide *d* into the vaporizer *b* in order to 80 here give up its heat for the generation of working steam which flows through the tube *g*. In consequence of the giving up of heat the waste steam condenses and passes through the tube 6 into the atmosphere or to an air- 85 pump.

If more waste steam enters than is required by the vaporizer *b*, the pressure of the waste steam and that of the generating working steam becomes greater than the normal, the 90 pressure on the membrane *f* then becomes greater than the counter-pressure of the spring *g*, the slide *d* and *e* will change their position and by means of the slide *d* will check or entirely stop the flow of the waste 95 steam to the vaporizer *b*, while the excessive portion of the waste steam not required in the vaporizer will pass through the open slide *e* into the atmosphere or through the tube 7 into the condenser *c*, and in the latter will be 100 condensed by cooling-water. The condensed waste steam passes through the tube 8 into the atmosphere or to an air-pump. As soon as the consumption of heat in the vaporizer *b* is

again greater than corresponds to the above-mentioned checked flow of steam through the slide *d* and the tube *5* the pressure of the working steam upon the membrane *f* drops, and
5 in consequence of the pressure of the spring the slides *d* and *e* are so actuated that by means of the slide *e* the discharge of the waste steam to the condenser *c* is closed, so that the whole of the waste steam passes through the
10 slide *d* and the pipe *5* into the vaporizer.

I desire it to be understood that various modifications may be made and equivalents used without departing from the nature of my invention.

15 What I claim, and desire to secure by Letters Patent of the United States, is—
The herein-described process of regulating

the supply of a heating fluid, which consists in causing a portion of said fluid to vaporize another fluid, while the remainder of the 20 heating fluid is caused to travel at a distance from the other fluid so as to exert no action thereon, and utilizing the variations in the pressure of the vapors for controlling the relative proportion of the two portions of 25 the heating fluid, according as the pressure changes.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANZ WINDHAUSEN, JUN.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.