

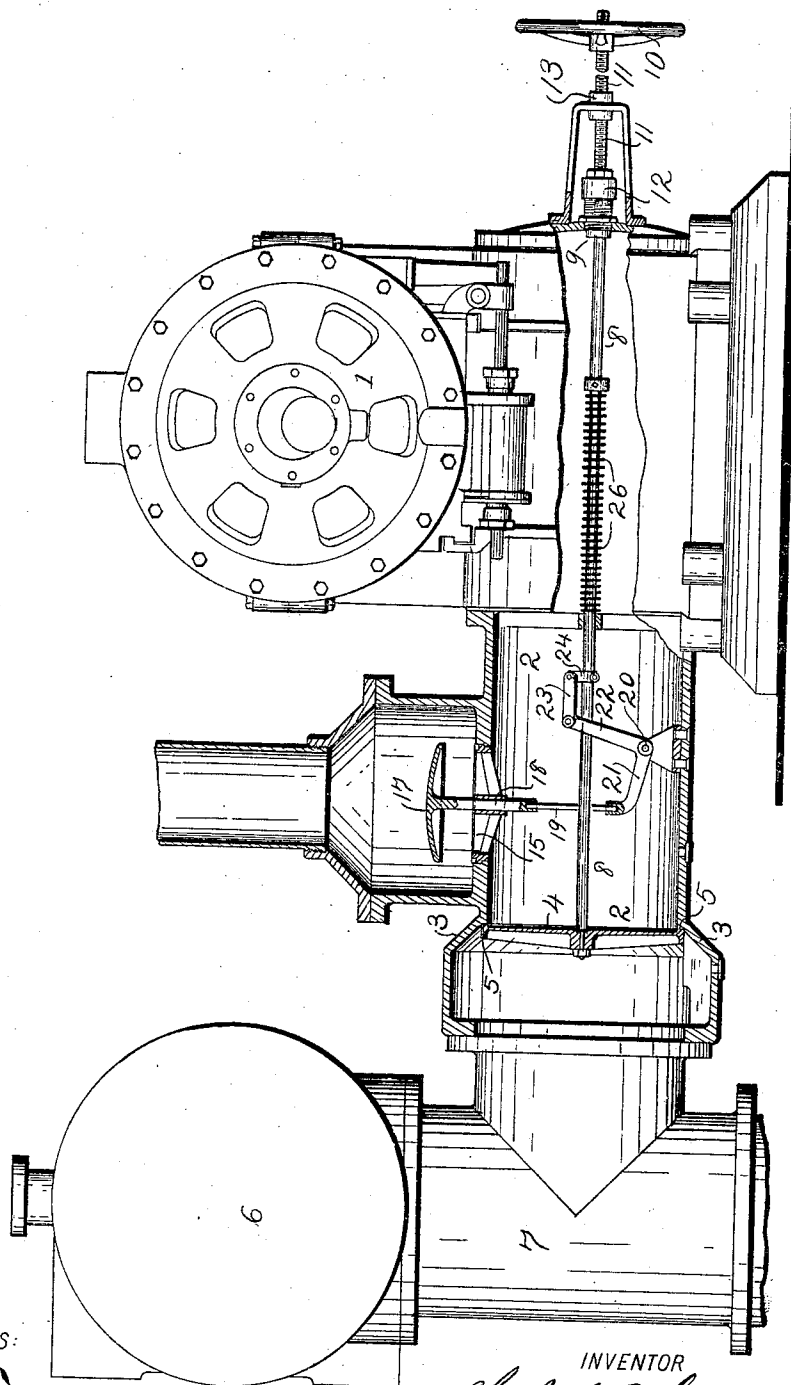
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PATENTED JUNE 11, 1907.

C. A. BACKSTROM.

AUTOMATIC EXHAUST RELIEF VALVE.

APPLICATION FILED MAR. 28, 1904. RENEWED APR. 22, 1907.



WITNESSES:
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UNITED STATES PATENT OFFICE.

CHARLES A. BACKSTROM, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO BACKSTROM-SMITH STEAM TURBINE & MANUFACTURING COMPANY, A CORPORATION OF WISCONSIN.

AUTOMATIC EXHAUST RELIEF-VALVE.

No. 856,202.

Specification of Letters Patent.

Patented June 11, 1907.

Application filed March 28, 1904. Renewed April 22, 1907. Serial No. 369,571.

To all whom it may concern:

Be it known that I, CHARLES A. BACKSTROM, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Automatic Exhaust Relief-Valves, of which the following is a specification.

My invention relates to improvements in automatic exhaust relief valves.

The object of my invention is to provide means for temporarily relieving a condenser which is overcharged or out of order by closing the inlet to the same and discharging the fluid into the air until the condenser is again ready to receive it, the mechanism being designed for operation either automatically or manually.

In the following description reference is had to the accompanying drawing in which a turbine is shown in end elevation and with the walls of the connecting passage leading from the turbine exhaust to the condenser shown in longitudinal section.

1 is a turbine, 2 a connecting chamber having walls expanded at 3 and provided with a valve 4 seating at 5 against the pressure of the exhaust gases from the turbine and controlling the flow of such fluid to the condenser 6 through an inlet pipe 7 which, for convenience in description, will be termed the vacuum chamber. The valve 4 is provided with a stem 8 which extends through a wall of the connecting chamber at 9 and is adapted to be manually actuated by a nut 10 on the screw threaded end portion 11 of the stem; 12 is a stuffing box and 13 is a bearing box for the valve stem which may also be packed if desired. The connecting chamber is also provided with a port 15 communicating with the open air or, if desired, with an auxiliary condenser. This port is normally closed by a valve 17 which is connected with the main valve 4 through the medium of a valve stem 18, connecting rod 19, an elbow lever pivoted at 20 and having arms 21 and 22, links 23, arms 24, and the valve stem 8, with which the arms 24 are rigidly connected. These connections are so arranged that when the valve 4 is closed, motion will be communicated through said connections to open the valve 17 as shown in the drawing. When the valve 4 is opened a reverse motion is

transmitted to close the valve 17. A spring 26 tends to hold the valve 4 to its seat, but the pressure of the exhaust fluid from the turbine will open the valve when the pressure of such fluid materially exceeds that of the fluid in the condenser, unless the nut 10 is adjusted to prevent the valve 4 from opening. When the valve 4 is opened, if the fluid accumulates in the condenser sufficiently to permit the spring 26 to close the valve 4 and open the valve 17, the fluid will then exhaust from the turbine through the port 15 until the vacuum in the condenser is again sufficiently complete to permit valve 4 to open. The area of the valve 4 is greater than that of valve 17 so that the former is constituted the controlling valve as it is more sensitive to differences in pressure on its front and rear surfaces than the other valve.

While for convenience, my invention has been described as applied to a condenser, it will be understood that any means for disposing of the fluid in the rear valve 4, whether by condensation, by pumping, or otherwise, may be employed without departing from the scope of my invention.

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

1. The combination with a fluid actuated motor; of a vacuum chamber arranged to receive fluid from the exhaust port of the motor; a valve controlling the delivery of fluid from the motor to said vacuum chamber; an auxiliary valve located at one side of the path of the motive fluid leading to said vacuum chamber and controlling the delivery of said motive fluid in another direction; said valves being connected to open and close in alternation; and means for closing said first mentioned valve when the fluid accumulates to a predetermined degree in the vacuum chamber.

2. The combination with a fluid actuated motor provided with an exhaust passage; of a main valve controlling the delivery of motive fluid through the exhaust passage in one direction; and an auxiliary valve located at one side of the path of the motive fluid leading to said vacuum chamber and controlling the delivery of such fluid in another direction; said valves being connected to open and close in alternation; a light tension

valve closing device connected to close the main valve when the pressure upon both sides of such valve is nearly balanced; said main valve being adapted to be opened 5 when the pressure beyond the main valve is reduced substantially below the pressure of the motive fluid discharged from said motor.

3. The combination with a fluid actuated motor provided with an exhaust passage, of 10 a main valve controlling the delivery of motive fluid through the exhaust passage in one direction; an auxiliary valve controlling the delivery of such fluid in another direction; said valves being connected to open and 15 close in alternation; a valve closing device operative with light tension to close the main valve against the pressure of motive fluid in the exhaust passage when the pressure on both sides thereof is nearly balanced; 20 and means for reducing the pressure on the outer face of the valve.

4. The combination with a vacuum chamber provided with a connecting inlet passage; a self closing main valve controlling the delivery of motive fluid through said passage 25 to the vacuum chamber; an auxiliary valve controlling the delivery of such fluid from the connecting passage to a point exterior to the vacuum chamber; and elbow crank connections between the valves arranged to 30 transmit motion from one to the other to open and close them in alternation; said main valve being adapted to be opened by the pressure of the fluid, when the pressure 35 in the vacuum chamber is materially below the normal atmospheric pressure.

5. The combination with a fluid actuated motor provided with a vacuum chamber, and a passage connecting its exhaust port

with the vacuum chamber; a main valve 40 arranged to close against the pressure and controlling the delivery of motive fluid to the vacuum chamber; an auxiliary valve connected to open and close alternately 45 with the main valve and controlling the delivery of motive fluid to a point exterior to the vacuum chamber; a valve stem connected with the main valve; and a spring connected with the stem and arranged to draw the valve in the direction of its seat; said spring 50 being adapted to yield when the pressure on the inner face of the main valve is in excess of that on its outer face.

6. The combination with a fluid actuated motor provided with a vacuum chamber and 55 a passage connecting its exhaust port with the vacuum chamber; a main valve arranged to close against the pressure and controlling the delivery of motive fluid to the vacuum chamber; an auxiliary valve con- 60 nected to open and close alternately with the main valve and controlling the delivery of motive fluid to a point exterior to the vacuum chamber; a valve stem connected with the main valve; and a spring connected 65 with the stem and arranged to draw the valve in the direction of its seat; said spring being adapted to yield when the pressure on the inner face of the main valve is in excess of that on its outer face; together with means 70 for manually operating the valves.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES A. BACKSTROM.

Witnesses:

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