

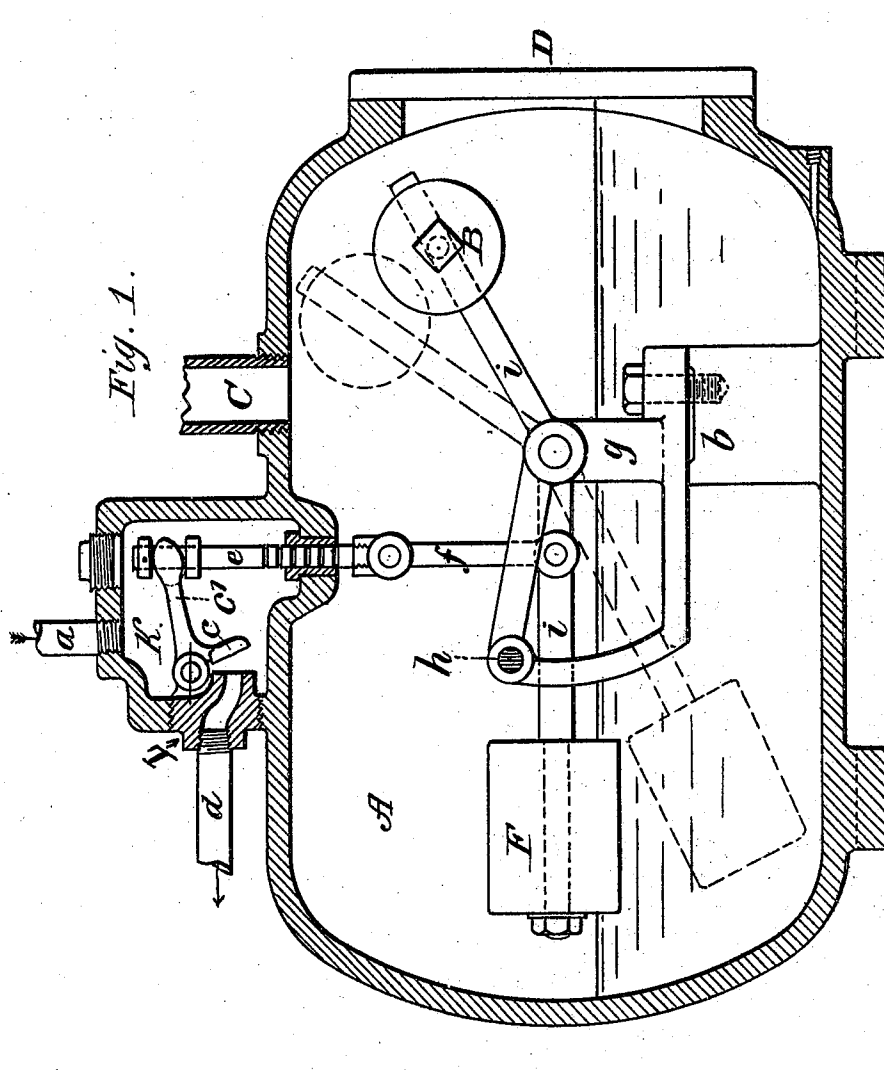
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3 Sheets—Sheet 1.

G. DE LAVAL.
AUTOMATIC FEED APPARATUS.

No. 503,972.

Patented Aug. 29, 1893.



Witnesses,
Charles Smith
J. Staib

Inventor,
George de Laval
per Lemuel W. Correll
Att'y

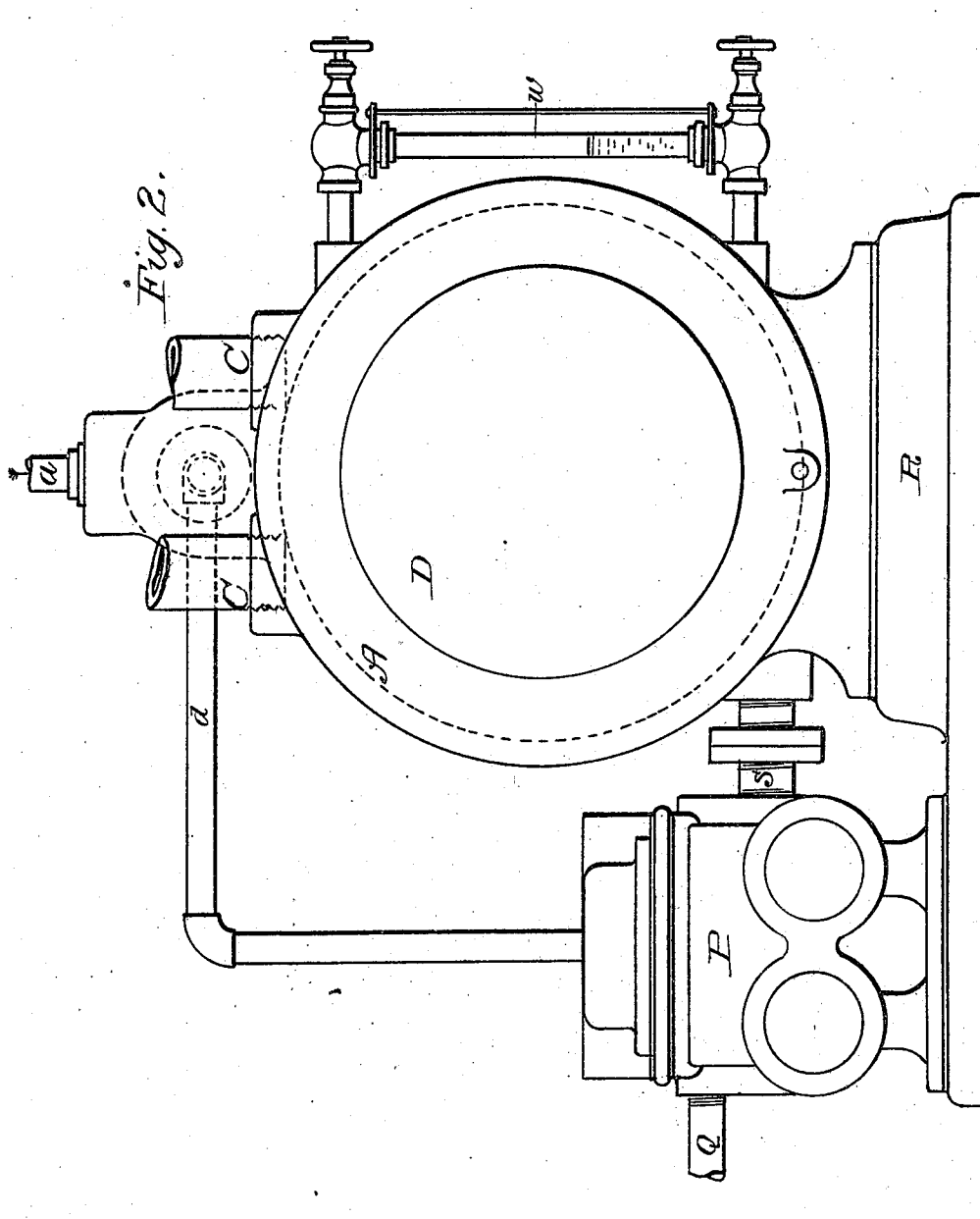
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per Lemuel W. Serrell
Atty

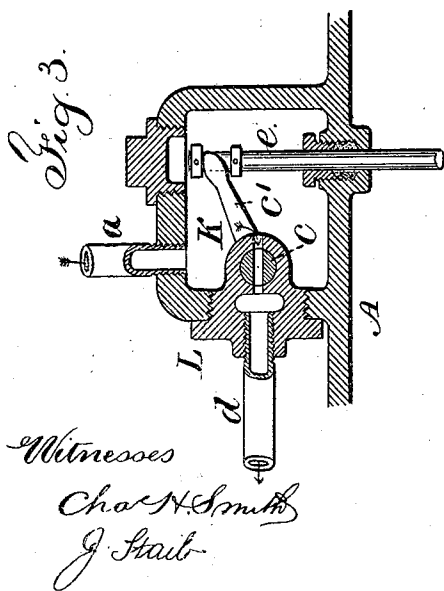
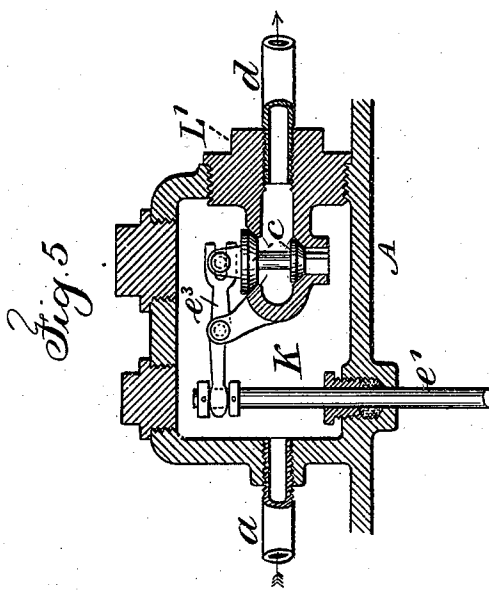
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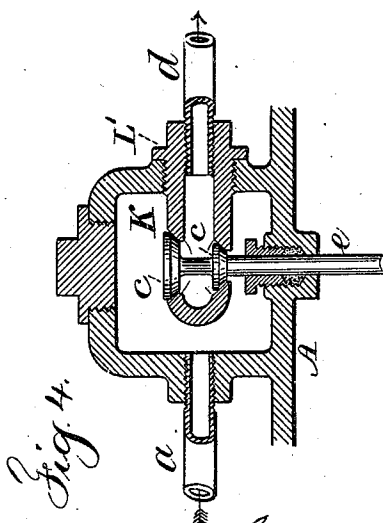
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Witnesses

Chas. N. Smith
J. Strait



Inventor

George de Laval
per Lemuel W. Serrell
Atty.

UNITED STATES PATENT OFFICE.

GEORGE DE LAVAL, OF WARREN, MASSACHUSETTS, ASSIGNOR TO THE GEO.
F. BLAKE MANUFACTURING COMPANY, OF NEW YORK, N. Y.

AUTOMATIC FEED APPARATUS.

SPECIFICATION forming part of Letters Patent No. 503,972, dated August 29, 1893.

Application filed February 13, 1893. Serial No. 462,108. (No model.)

To all whom it may concern:

Be it known that I, GEORGE DE LAVAL, a citizen of the United States, residing at Warren, in the county of Worcester and State of Massachusetts, have invented an Improvement in Automatic Feed Apparatus, of which the following is a specification.

My invention relates to a receiver for water of condensation and automatic devices connected therewith and acted upon by the accumulated water of condensation for the transference of said water of condensation back to the boiler by the opening and closing of the supply of live steam to a pump according to the height of said water of condensation in said receiver.

In carrying out my invention I employ in connection with the receiving vessel a steam chamber upon the same into which live steam enters from the boiler and from which said live steam passes to the pump, and within said steam chamber is a valve opening or closing the supply of steam to the pump, which devices are operated automatically by the height of the water in said receiving vessel by means of a float of peculiar construction operating with a balance weight.

In the drawings, Figure 1 is a vertical longitudinal section of my improved apparatus. Fig. 2 is an elevation illustrating my apparatus and a steam pump and the connection between the same, and Figs. 3, 4 and 5 represent some of the devices for controlling the supply of steam.

A represents the receiver for the water of condensation, which enters therein through the pipes C from radiators, surface condensers, coils, steam jackets, &c. Said receiver A is upon a base R and is provided with a removable head D, and said receiver is connected to the pump P by the pipe S, and *w* represents a gage for showing the height of water in the receiver A. Within said receiver is a support *b* to which is connected a pedestal *g* carrying a stopping arm *h*. To this pedestal *g* is pivoted a rocking arm *i*, the two ends of said arm being at an obtuse angle to each other.

The weight B is upon one end of the arm *i* and the float F upon the other end, and the

weight B I prefer to make adjustable longitudinally on the arm.

A link *f* is connected to the arm *i*, and the rod *e* connected to the link *f* passes up through a stuffing box or gland in the top of the receptacle and into the steam chamber K. Steam is admitted from the boiler to this steam chamber by the pipe *a* and passes therefrom through the bushing L by the pipe *d* to the pump P.

A valve *c* within the steam chest K is operated by the rod *e* and link *f* through the rise and fall of the float F either to close the entrance to the pipe *d* and shut off the supply of steam when the water in the receiver A is low, or to open said valve *c* and admit steam to the pump when the water in the receiver rises, so that the pump may operate to remove said water from said receiver and transfer it into the boiler, the supply of steam being again shut off as the float F falls.

The float F I prefer to make of tiling or similar burned or vitrified material, as the same is lighter in weight than a solid float of other material and is not open to the objections of a hollow metal float which is liable to collapse or be broken, and is also not liable to the objections of a wooden float which would be water soaked, the tiling or vitrified material being very strong and absorbing only a very small percentage of water. The weight B is adjusted to counterpoise the float when partly immersed, so that the float rises and falls with the rise and fall of the water, because of the displacement of water by the float. This floating device is not liable to get out of order.

In Fig. 1 the valve *c* has an arm *c'* that passes between heads on the rod *e*, and with the movement of said rod said arm moves up and down to open or close the steam pipe to the pump by the valve *c*.

The valve in Fig. 3 is a rocking valve or plug operated by a similar arm to open and close the steam passage from the steam chamber K to the pipe *d* and pump.

The valve in Fig. 4 is a balanced direct acting valve that is seated in an inwardly projected hollow bushing L' but the operation is the same as before described.

The valve in Fig. 5 is of similar construction

tion to that in Fig. 4 but it is operated by a rocking lever connection e^3 to the rod e' , the rod e' in this case being connected to the pivoted lever i carrying the float and weight in any convenient manner either directly or by an additional arm.

I claim as my invention—

1. The combination with the receiver A having a removable head D by which access is had to its interior, and a steam chest K upon the receiver having inlet and outlet pipes and a valve; of a support within the receiver, a pedestal removably connected to said support, a rocking arm pivoted to said pedestal, an adjustable weight upon one end of said rocking arm, and a float upon the other end thereof and a connection from said rocking arm into the steam chest and to its valve, substantially as set forth.

2. The combination with the receiver A for

water of condensation, the removable head D by which access is had to the interior of the receiver, a pump, and a steam chest upon and formed with said receiver and having a steam inlet pipe, a valve, and an outlet pipe leading to the pump; of a support b within the receiver, a pedestal g removably connected upon the support b and having a stopping arm h , an obtuse angled rocking arm i pivoted to said pedestal, an adjustable weight upon one end of said rocking arm, and a float upon the other end thereof, and a connection from said rocking arm into the steam chest and to its valve, substantially as set forth.

Signed by me this 8th day of February, 1893.

GEORGE DE LAVAL.

Witnesses:

GEORGE P. ABORN,
FRED E. COOK.