No. 677,458. Patented July 2, 1901.

J. & W. LLOYD & R. O. JONES.

STEAM ELIMINATOR.

(Application filed Feb. 18, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 4.

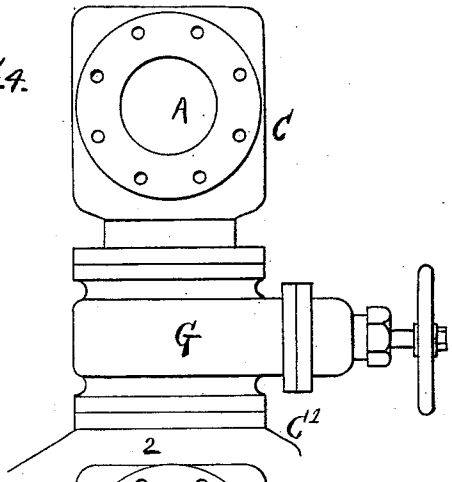


FIG. 3.

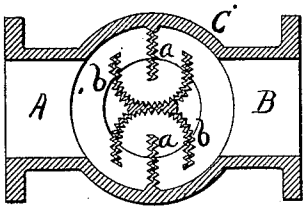


FIG. 1.

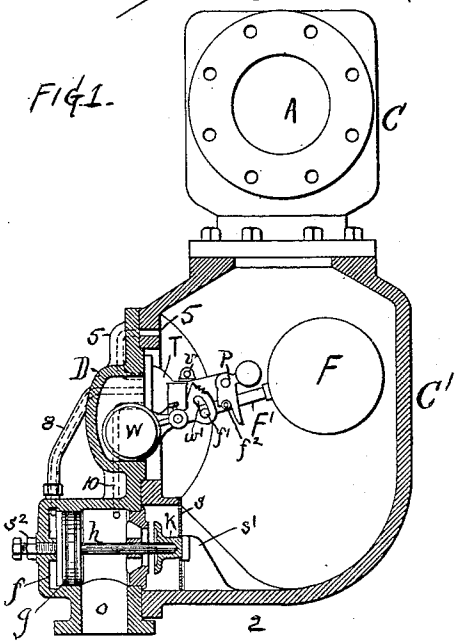
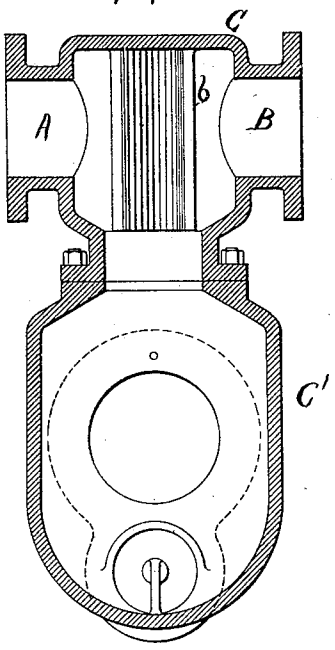


FIG. 2.



WITNESSES:

F. W. Wright.

A. C. Connor

INVENTORS

John Lloyd.

John Lloyd.

Richard O. Jones.

BY

Howson and Howson

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 677,458. Patented July 2, 1901.

J. & W. LLOYD & R. O. JONES.

STEAM ELIMINATOR.

(Application filed Feb. 18, 1901.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 8.

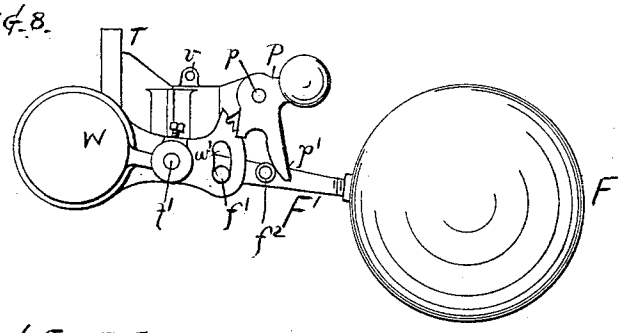


FIG. 5.

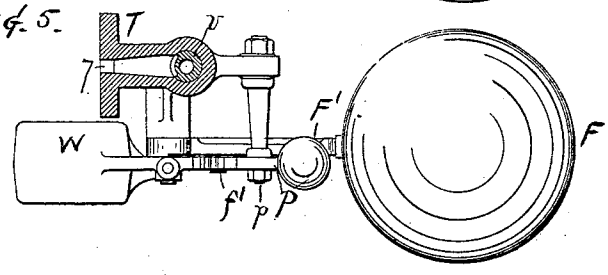


FIG. 6.

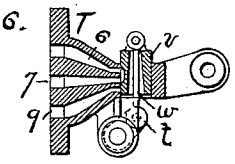


FIG. 9.

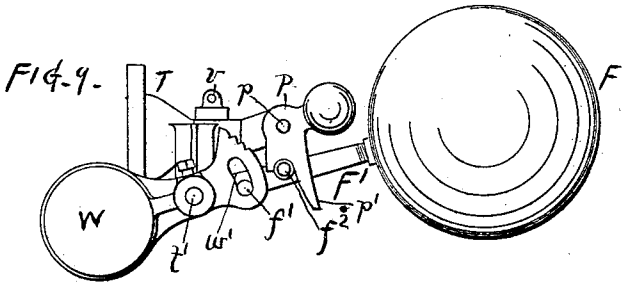
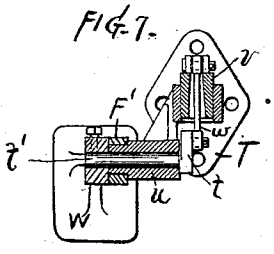


FIG. 7.



WITNESSES:

F. W. Wright.

S. C. Cruson

Wm Lloyd

John Lloyd,

Richard O. Jones.

INVENTORS.

BY

Howson and Howson

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN LLOYD, OF FORTYFORT, WILLIAM LLOYD, OF TAMAQUA, AND RICHARD O. JONES, OF JEANESVILLE, PENNSYLVANIA.

STEAM-ELIMINATOR.

SPECIFICATION forming part of Letters Patent No. 677,458, dated July 2, 1901.

Application filed February 18, 1901. Serial No. 47,844. (No model.)

To all whom it may concern:

Be it known that we, JOHN LLOYD, a resident of Fortyfort, in the county of Luzerne, WILLIAM LLOYD, a resident of Tamaqua, county of Schuylkill, and RICHARD O. JONES, a resident of Jeanesville, in the county of Carbon, State of Pennsylvania, citizens of the United States of America, have invented an Improved Steam-Eliminator, of which the following is a specification.

Our invention relates to improvements in steam-eliminators or apparatus for the purpose of eliminating water, entrained moisture, grease, oil, or impurities from steam at any pressure and automatically discharging such eliminated water, &c., without waste or loss of steam.

Our present invention is in the nature of an improvement upon the steam-eliminator for which we obtained Letters Patent No. 600,921, dated March 22, 1898.

The main object of our present invention is to improve the construction and mode of operation of the apparatus, particularly with the view of insuring a quick discharge of the water from the collecting vessel irrespective of the rate at which the water is eliminated from the steam.

In the accompanying drawings, Figure 1 is a vertical section of our improved apparatus, the section being taken through the collecting-chamber, while the baffle-chamber is shown in end view. Fig. 2 is a vertical section on the line 2 2, Fig. 1, the cover-plate and the parts carried by it being shown as removed. Fig. 3 is a sectional plan view on the line 3 3, Fig. 2. Fig. 4 is a view of a modification. Figs. 5, 6, and 7 are sectional views of the valve mechanism; and Figs. 8 and 9 are external views of the float and levers for controlling the valve mechanism, these parts being shown in two different positions in the two views.

Referring to Figs. 1, 2, and 3, C is the baffle-chamber, with steam-inlet A and steam-outlet B, and C′ is the collecting casing or chamber below. Instead of making the baffle-chamber and the collecting-chamber in one casing, as illustrated in our former patent, and closing it at the top with a cover we now make the baffle-chamber C separate from the collecting-chamber C′, so that the two parts may be bolted together, as shown in Figs. 1 and 2, the top of the baffle-chamber being made in one with the body thereof. This gives the advantage not only of convenience of manufacture, but also enables us to introduce between the baffle-chamber C and the collecting-chamber C′ a gate-valve G, as illustrated in Fig. 4, where desired, so that in case the collecting-chamber C′ has to be opened to clean it out or for repairs the gate-valve G can be closed to permit this to be done, while allowing the steam to flow through the main for the time being.

We provide, as before, corrugated surfaces or baffle-plates to eliminate the water, &c.; but we prefer to make them as illustrated in Figs. 2 and 3—that is, in the form of a pair of vertical plates *b* of trough-like or U section in the center of the chamber and two plates *a*, projecting inwardly from the walls of the chamber into the troughs formed by the plates *b*, Fig. 3. These several baffle-plates have the sharp-edge vertical corrugations illustrated in the drawings.

As in the device of our former patent, there is an outlet-valve *k* to be operated by a piston *g*, on the stem *h* of which the valve *k* is fitted. The opening of this discharge-valve to the outlet-pipe *o* is effected by the admission of steam to the space in the steam-cylinder *f* behind the piston *g*. The closing of the discharge-valve will take place by the pressure of the steam through the body of the water in the casing C′ on the face of the valve *k*, when the steam-pressure is relieved or allowed to exhaust from behind the piston *g*. This admission of steam to and its exhaust from the cylinder *f* behind the piston *g* is controlled by the vertically-moving valve *v*, Figs. 5, 6, and 7, and the movement of this valve is controlled by the float F, carried by the lever F′. This lever F′ is pivoted to turn freely upon the outer reduced end of the bearing *u*, Fig. 7, forming part of the bracket T, which is bolted or otherwise secured to the removable cover or hood D, Fig. 1. The vertically-sliding valve *v* is connected by a rod *w* to a crank *t* on the end of a spindle *t′*, passing through and turning in the bearing *u*. To the end of the spindle *t′* is secured, by

a set-screw or otherwise, a weighted trip-lever W, which is connected to the lever F' of the float by means of a pin f' on the lever working in a slot w', Figs. 8 and 9, in the weighted lever W. When the float F descends, this pin f' will bear on the bottom of the slot w', and the counterweight of the lever W will be outweighed and the spindle t' turned, so as to draw down the valve v. When the float reaches its lower position, a weighted tripping-pawl P, pivoted on the bolt p on the bracket T, Figs. 8 and 9, will click into engagement with one or other of the ratchet-teeth on the forward end of the weighted trip-lever W and so retain the lever in that position, Fig. 8, with the valve v drawn down until the float F, rising again, brings the pin f^2 on the lever F' of the float into contact with the toe p' of the pawl P, Fig. 8, to trip or disengage this pawl P from the tooth of the weighted lever W, Fig. 9. The consequent quick drop of this lever W from the position shown in Fig. 8 to that shown in Fig. 9 will throw the valve v up to the position shown in Figs. 6 and 7.

A steam-passage 5 from the upper part of the collecting-chamber C', Fig. 1, leads to a port 6, Fig. 6, in the bracket T, while a port 7 in the bracket T connects through a pipe 8 with the space in the cylinder f behind the piston g. A port 9 in the bracket T, Fig. 6, connects through a passage 10 in the cover D, Fig. 1, with the discharge-outlet O or atmosphere. When the valve v is in the upper position, (illustrated in Fig. 6,) steam can pass from the upper part of the collecting-chamber C' through passage 5 and port 6, valve v, port 7, and pipe 8 to the steam-space behind the piston and so cause the opening of the valve k and the discharge of the water from the collecting-chamber. When thereupon the float F descends and carries with it the weighted lever W, turning the spindle t', drawing down the valve v, the port 6 will be closed, the steam-supply cut-off will be cut off from the cylinder f, and then the space behind the piston will be open to the atmosphere through the pipe 8, port 9, and passage 10. Thereupon the pressure of the steam upon the body of water remaining in the collecting-chamber C' will close the valve K to its seat again.

A perforated strainer-plate s may be provided in front of the outlet-valve k, as shown in Fig. 1. A stop s' is provided to limit the opening movement of the valve k, while an independent adjustable stop s^2 is provided to limit the return movement of the piston g, the valve k being free on the spindle h.

By the introduction of trip mechanism such as described between the float and the valve v we are able to insure a quick discharge of the accumulated water irrespective of the rate at which the water is eliminated from the passing steam.

As seen on reference to Fig. 1, the hood or cover D, which is to be removably bolted to the casing, carries not only the float and the controlling slide-valve, but also the discharge-valve k, piston g, cylinder f, and outlet-pipe o, so that by simply removing this cover D the whole of the mechanism can be quickly and easily got at for repairs, and the casing C' can also be cleaned speedily.

We claim as our invention—

1. In a steam-eliminator, a collecting-chamber having a discharge-valve and a piston controlling the discharge-valve, in combination with a valve controlling supply of steam to the said piston, a float controlling this steam-valve and a trip device between the float and steam-valve, all substantially as described.

2. In a steam-eliminator a collecting-chamber having a discharge-valve and a piston controlling the discharge-valve, in combination with a valve controlling the supply of steam to the said piston, a float, a weighted lever to operate the steam-valve and having a pin-and-slot connection with the float and a tripping-pawl to lock the weighted lever, but adapted to be thrown out by the float.

3. In a steam-eliminator, a collecting-chamber having a discharge-valve and a piston controlling the discharge-valve, in combination with a valve controlling the supply of steam to the piston, a weighted lever to open said steam-valve, a catch to lock the lever with the steam-valve closed and a float to act on the catch on rising and to close the steam-valve on descending, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN LLOYD.
WM. LLOYD.
RICHARD O. JONES.

Witnesses:
ANTHONY MCHALE,
WM. J. SCHMIDT.