

(No Model.)

C. E. WOLLÉ & A. TROUT.
STEAM SEPARATOR.

No. 511,314.

Patented Dec. 19, 1893.

FIG. 1.

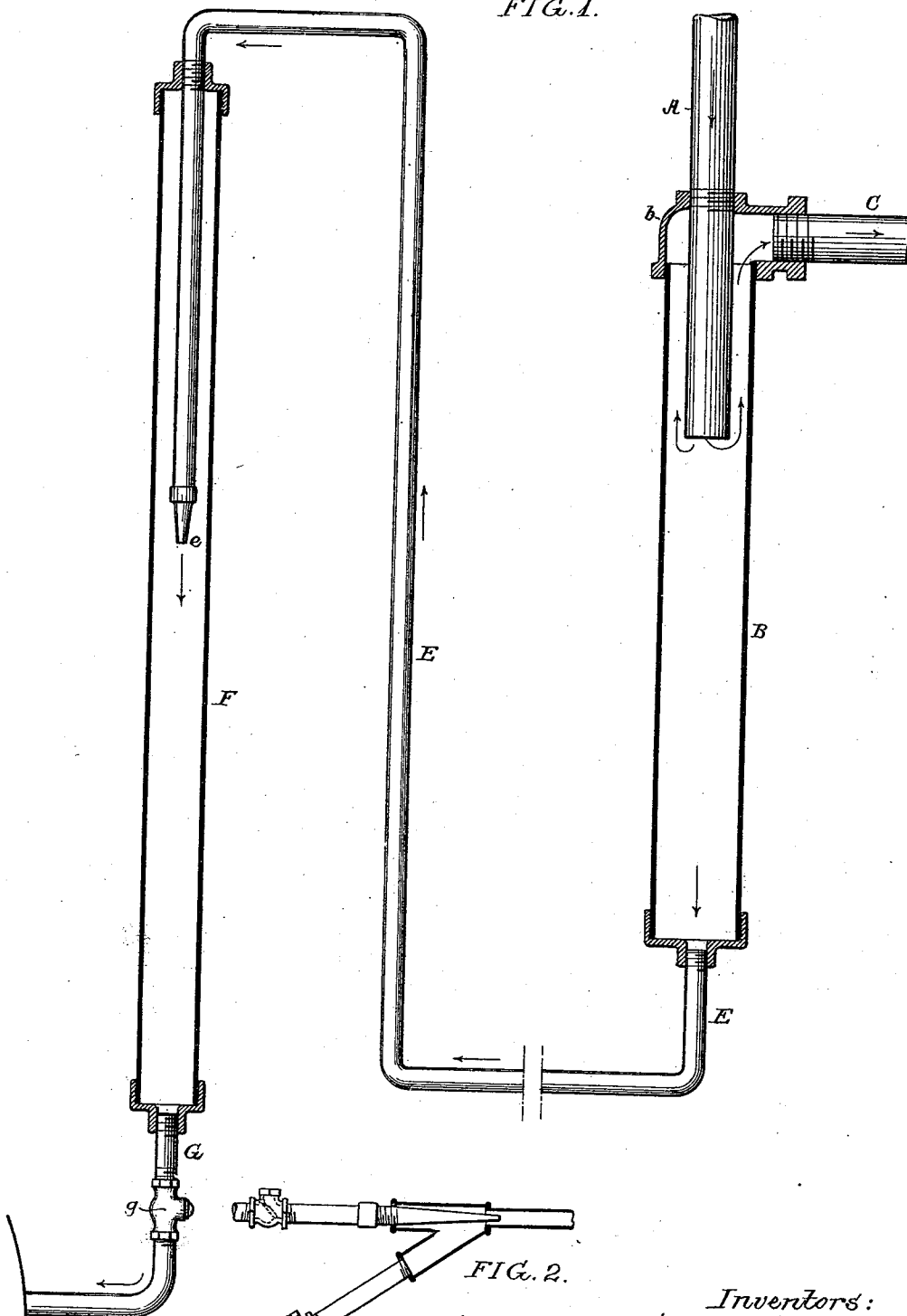


FIG. 2.

Witnesses:
R. Schleicher.

William A. Barr.

Inventors:
Charles E. Wollé &
Amos Trout
by their Attorneys
Hosson & Hosson

UNITED STATES PATENT OFFICE.

CHARLES E. WOLLÉ AND AMOS TROUT, OF PHILADELPHIA, PENNSYLVANIA.

STEAM-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 511,314, dated December 19, 1893.

Application filed April 19, 1893. Serial No. 471,012. (No model.)

To all whom it may concern:

Be it known that we, CHARLES E. WOLLÉ and AMOS TROUT, both citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain Improvements in Steam-Separators, of which the following is a specification.

The object of our invention is to separate the steam from the water of condensation at the engine, or in steam pipes where dry steam is required, and to carry the said water of condensation back to the boiler. This object we attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1, is a sectional elevation of our improved steam separator. Fig. 2, is a diagram illustrating the method of carrying the water from the high and low pressure pipes.

It is the common practice at the present time in large factories, to erect the boilers at a central point, and to place the engines in the shops so that they can be belted directly to the line shafting. This arrangement necessitates the carrying of the steam a considerable distance to the engines or steam system in which the steam is to be utilized, and while the pipes are covered and protected in the best possible manner, nevertheless there is a certain proportion of the steam condensed before it reaches the engines, and our object is to separate this water of condensation from the steam prior to its entering the engine, and to carry the water of condensation back to the boiler.

Referring to the drawings, A is the steam pipe from the boiler; this pipe has an extension *a* which enters a comparatively long chamber B. This chamber has a coupling head *b* at its upper end to which the pipe A is coupled, and to which the steam pipe C is also coupled. This steam pipe carries the separated steam from the chamber B to the engine. Water of condensation and the steam entering the chamber through the pipe A will be forced into the chamber and the water will fall to the bottom while the steam will rise to the top and escape through the pipe C. Consequently there is at all times a pressure of steam in the chamber B.

Attached to the base of the chamber is a re-

turn pipe E for the water of condensation. This return pipe extends to a point near the boiler or boilers, and is connected at this point to a receiver F. It enters the upper portion of the receiver and extends to a certain point therein, as shown in Fig. 1. The end of the pipe is provided with a nozzle *e* so that the water enters the receiver at a pressure sufficient to force the body of water in the receiver into the boiler. To the bottom of the receiver is connected a pipe G which is coupled to the boiler at the proper point, and in this pipe is a check valve *g* which prevents the flow of water from the boiler into the receiver.

We find by a series of experiments that there is not a steady flow of water through the pipe E to the receiver, but there will be an intermittent discharge of water and steam; the amount of steam discharging is comparatively small, but is sufficient to carry the water of condensation from the chamber B to the boiler, and when it passes through the nozzle *e* it will force the water back into the boiler.

The receiver F may receive the water of condensation from a number of engines, and where it receives water from a high pressure engine and a low pressure engine, we arrange the coupling as shown in Fig. 2, the high pressure pipe terminating in a nozzle in the low pressure pipe, thus preventing back pressure in the low pressure pipe.

We find by the above described apparatus that the water of condensation which naturally collects in the steam pipe from the boiler to the engine, is separated at the engine, and the steam in a comparatively dry state enters the engine while the water is forced back to a point adjacent to the boiler, from which point it is forced into the boiler.

The mechanism is so arranged that the device can be applied to plants in shops of one or two stories, as we do not rely upon the fall of water or live steam to give the necessary pressure to enter the boiler.

It will be understood that the chamber B may be inserted at the terminal points in steam heating apparatus, or at intermediate points in long lengths of steam pipes without departing from our invention.

We claim as our invention—

1. The combination in a steam separator, of the chamber arranged some distance from the boiler, an inlet for the steam from the boiler, and an outlet for the steam, the said outlet being arranged near the upper end of the chamber, a water return pipe coupled to the lower portion of the chamber, and extending to a point near the boiler, a receiver at this point into which the return pipe extends, a nozzle at the end of said return pipe, and a pipe extending from the receiver to the boiler, substantially as described.

2. The combination of two or more chambers arranged at their respective points, steam inlets and outlets therefor, a water return pipe, connections between the chambers and said return pipe, a receiver at the boiler, said receiver being coupled to the return pipe terminating in a nozzle therein and coupled to the boiler, substantially as described.

3. The combination of two or more cham-

bers situated near their respective systems, the said systems being of different pressure, steam inlets and outlets therefor, water return pipes from the chamber, said water return pipes being coupled together, the high pressure water return pipe terminating in a nozzle in the low pressure return pipe the said low pressure return pipe extending to a point near the boiler, a receiver at this point into which the water return pipe extends, and a pipe forming a communication between the receiver and the boiler, substantially as described.

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

CHAS. E. WOLLÉ.
AMOS TROUT.

Witnesses:

FRANK H. MASSEY,
MAURICE R. MASSEY.