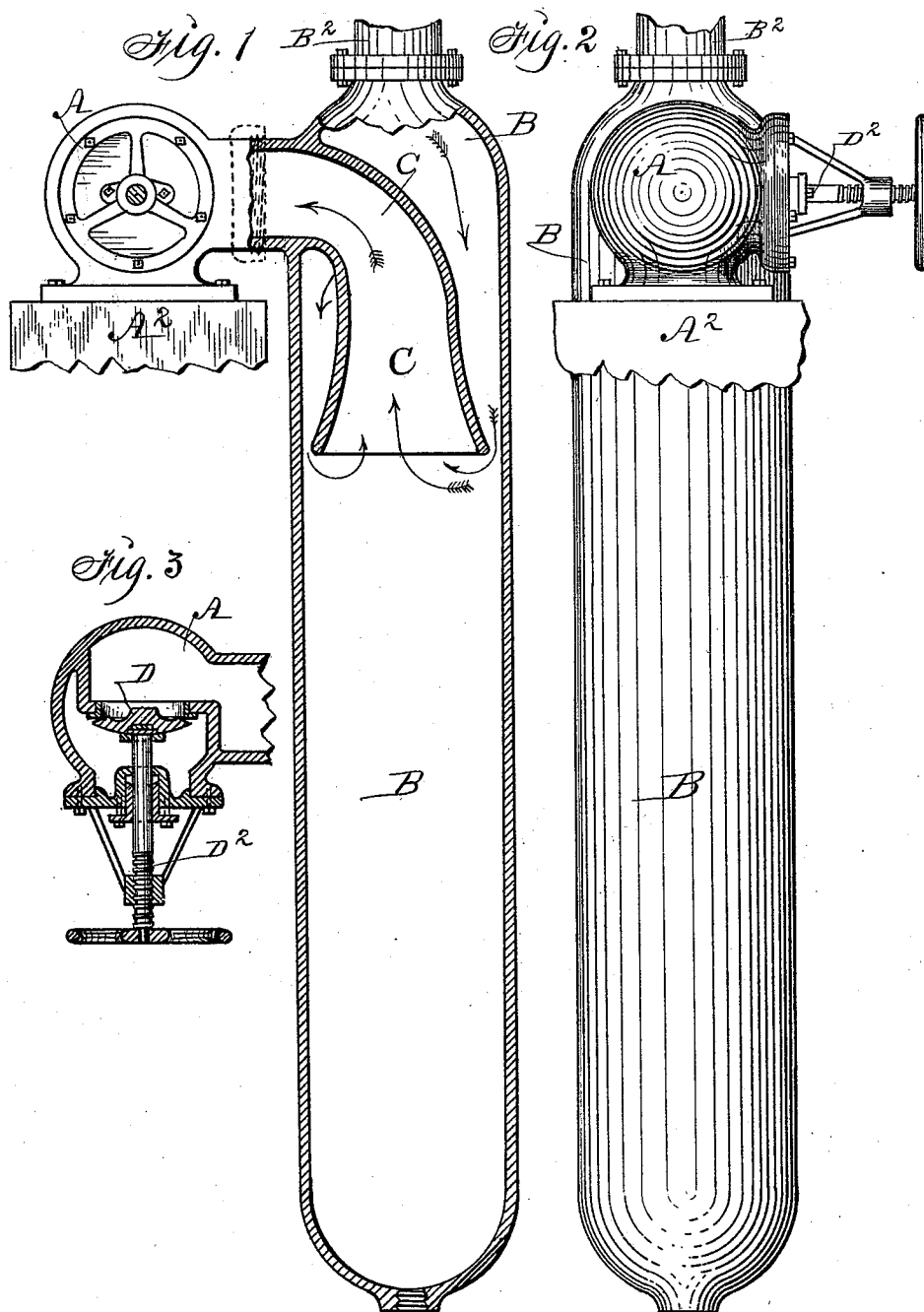


(No Model.)

G. W. AULMANN & W. R. HARRIS.
STEAM SEPARATOR.

No. 521,492.

Patented June 19, 1894.



Witnesses: } Inventors: George W. Aulmann,
R. H. Orwig } William R. Harris,
Charles F. Wilcox } By Thomas G. Orwig, atty.

UNITED STATES PATENT OFFICE.

GEORGE W. AULMANN AND WILLIAM R. HARRIS, OF DES MOINES, IOWA.

STEAM-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 521,492, dated June 19, 1894.

Application filed February 23, 1894. Serial No. 501,315. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. AULMANN and WILLIAM R. HARRIS, citizens of the United States of America, residing at Des Moines, in the county of Polk and State of Iowa, have invented a Steam and Water Separator and Throttle-Valve Combined, of which the following is a specification.

Heretofore the straight end of a steam supply pipe has been extended into the top of a separator chamber and in concentric position with the chamber in such a manner as to produce an annular space of uniform width around that portion of the supply pipe inside of the chamber so that the steam discharged downward into the chamber would rise and escape through an eduction tube at the top of the chamber and drops of water discharged from the supply pipe descend into the bottom of the chamber. But such device does not separate all the water from steam as required to allow only dry steam to escape from the top portion of the chamber as contemplated by the invention hereinafter set forth, pointed out in our claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side view (partly in section) of our complete device. Fig. 2 is a side view taken at right angles relative to Fig. 1, showing the valve operating mechanism. Fig. 3 is a horizontal sectional view through the line $x x$ of Fig. 2.

A represents a valve chamber adapted to be fixed on top of the steam chest A^2 of an engine.

B is the steam separator formed integral with the valve chamber A, or detachably connected therewith as indicated by dotted lines in Fig. 1. The top end of the separator chamber is contracted and adapted to be fixed to a steam supply pipe B^2 . An orifice in the concavo convex bottom of the separator chamber is adapted to be connected to a steam loop or trap to return the water of condensation to the boiler.

C is an open-ended steam conductor on the inside of the separator chamber and an integral part of the separator chamber B. Its upper end is connected with the valve chamber A and its lower end is bell-shaped and in concentric position with the wall of the chamber A and close to the wall so that there will be

a narrow annular passage for the steam that descends from the supply pipe into the separator chamber and then passes upward through the tube C and through the valve chamber to the steam chest A^2 .

D is the valve, D^2 the valve stem and D^3 a hand wheel on the end of the valve stem.

In the practical operation of our invention whenever steam and water descend from the supply pipe into the separator the steam will be accelerated in speed, as it passes through the narrow annular passage between the wall of the chamber B and the bottom edge of the bell-shaped mouth of the separator tube C, and then upward through the tube and the valve chamber to the place where it is to be utilized for operating machinery. The reverse direction of the steam thus caused within the separator chamber and the increase of speed in its passage resulting from the contracted annular passage way between the wide mouth of the separator tube C and the concentric wall of the chamber B, as it is reversed, cause the water in the steam to be separated from the steam by the centrifugal force resulting from the reverse motion of the steam as the steam passes around the lower edge of the wide mouth of the separator tube C. It is obvious that a complete separation of water from steam is thus automatically effected and that dry steam only will pass from the separator chamber into the engine, pump or system of piping as the case may be.

We claim as our invention—

1. A steam and water separator and throttle valve combined, consisting of a valve chamber and valve and valve operating mechanism, and a separator chamber connected with the valve chamber and also adapted to be connected with a steam supply pipe at its top end and provided with an opening at its bottom, and a concentric open-ended tube that extends downward from the valve chamber and terminates in a bell-shaped mouth in the central portion of the separator chamber, to produce a contracted annular steam passage way at the lower end of the separator tube to operate in the manner set forth.

2. In a steam and water separator, an open-ended separator tube, having a flaring or enlarged bell-shaped mouth at its lower end, in combination with a separator chamber adapt-

ed to be connected with a steam supply pipe
at its top end to produce a contracted annu-
lar steam passage way at the bottom of the
separator tube and a throttle valve at the up-
5 per end of the tube, and provided with an ori-
fice at its lower end for conducting water from
the separator chamber, to operate in the man-
ner set forth for the purpose of producing dry
steam.

10 3. In a steam separator, a separator cham-
ber having an open top adapted to be con-
nected with a steam supply pipe and an open-

ing in its bottom to discharge water and a
steam conductor extending outward from the
top of said chamber and adapted to be con- 15
nected with a valve chamber and extending
downward in the separator chamber and ter-
minating in an open bell-shaped mouth as
and for the purposes stated.

GEORGE W. AULMANN.
WILLIAM R. HARRIS.

Witnesses:

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