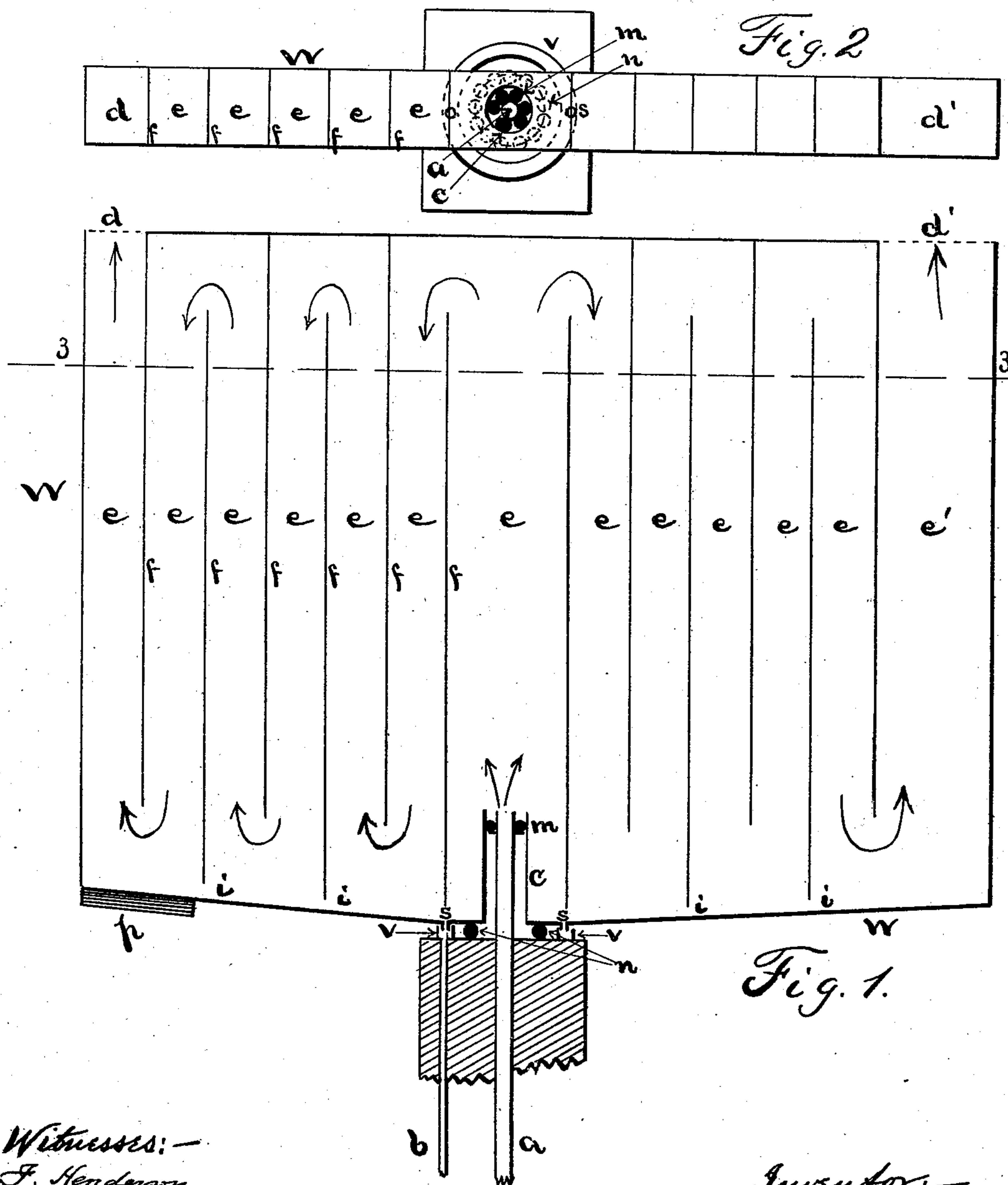


(No Model.)

H. A. WHEELER.
STEAM CONDENSER.

No. 550,009.

Patented Nov. 19, 1895.



Witnesses:—
F. Henderson
E. Clark

Inventor:—
H. A. Wheeler

UNITED STATES PATENT OFFICE.

HERBERT ALLEN WHEELER, OF ST. LOUIS, MISSOURI.

STEAM-CONDENSER.

SPECIFICATION forming part of Letters Patent No. 550,009, dated November 19, 1895.

Application filed March 22, 1895. Serial No. 542,847. (No model.)

To all whom it may concern:

Be it known that I, HERBERT ALLEN WHEELER, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented new and useful Improvements in Steam-Condensers, of which the following is a specification.

My invention relates to the condensation of exhaust or waste steam from engines and other steam-using machines and the collection of the water resulting therefrom for reuse; and with that object in view my invention consists of the following novel devices and combinations hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 is a longitudinal vertical section through the middle of the condenser, and Fig. 2 is a sectional plan on the line 3 3.

Similar letters refer to similar parts in both drawings.

The condenser is intended to be attached to the mouth of the exhaust-pipe of engines and other steam-using devices, and the condensation is to be performed by the wind or other cooling currents. It is therefore preferably located in an exposed position, as above the roof, and the condensation will be more or less complete, according to the size of the condenser, temperature of the cooling-currents, and similar modifying conditions.

The condenser consists of the mouth of the exhaust-pipe *a*, which opens into the long, high, but narrow chamber *w*, which, by a series of partitions or curtains *f*, is divided into a series of sub chambers or passages *e*. The curtains or partitions *f* reach alternately from the top of *w* to near the bottom and from the bottom to near the top, as shown, thus securing a long, continuous, circuitous passage for the exhaust-steam after it is discharged from *a* before it reaches the discharge vents or openings *d* and *d'*. In this long journey alternately up and down through the passages *e* the steam will be nearly or quite all condensed by coming in contact with the cooled sides of the passages *e* and will trickle down to the bottom of the chamber *w*. Small holes or openings *i* are made at the bottom of the curtains that rise from the bottom of the chamber, and by giving a pitch or slope to the bot-

tom of *w* toward the middle this water of condensation flows to the drain-spouts *s* and thence to the open launder or trough *v*, which connects with the drain-pipe *b*.

Where the quantity of steam to be condensed is small, so that a large condenser is not necessary, it is mounted like a weather-vane, so as to expose both of the long sides of *w* to the cooling action of the wind simultaneously by designing it to keep parallel with the direction of the wind. This is accomplished by carrying the weight of the condenser on a set of ball-bearings *u*, which enable it to freely revolve about the pipe *a* as an axis. To make it head and tail to the wind without using a vane or tail-board, the chamber *w* is not made symmetrical with the axis *a*, but has one of the end sub-chambers *e'* sufficiently lengthened as to make this act as a tail-board and thus head the condenser parallel with the wind, enabling the latter to sweep past both of the long sides of *w* at the same time with its consequent cooling action. To overcome the thrust that lengthening out the chamber *e'* produces from not balancing, a counterweight *p* is secured on the opposite and lower side of *w* to counterbalance the increased weight of the extra size of the compartment *e'*.

A collar *c* projects from the bottom of *w* and by means of ball-bearings *m* around the axis *a* acts as a vertical guide to withstand wind thrust and prevent the blowing away of the condenser.

The trough *v* is made circular, so that the spouts *s* are always able to discharge into it in spite of the revolving of *w* from changes in the direction of the wind.

Where the amount of steam to be condensed is so large as to make the mounting of the condenser as a weather-vane impracticable from its large size, then the ball-bearings and counterweights are dispensed with, the chamber is held rigidly instead of revolving, and two or more chambers similar to *w* are used, which will intersect at and be symmetrical with reference to *a*. Usually two such chambers will be used, which will intersect one another at an angle of ninety degrees and use the exhaust-pipe *a* and drain-spouts *s* and pipe *b* in common.

The chamber is made of sheet-copper or any

other good conductor of heat, and may be of any length, height, or width, and have any number of partitions. The sides of *w* may be straight, corrugated, serrated, or fluted.

5 What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a steam condenser, of a steam-pipe discharging into one or more chambers, said chambers resting on a series
10 of ball-bearings, a collar encircling said steam-pipe, ball-bearings between said collar and steam-pipe, drain spouts from bottom of said chambers, a circular, open gutter or launder under said spouts, and a drain-pipe

leading from said circular launder, substan- 15
tially as shown and described.

2. The combination, in a steam condenser, of a steam-pipe entering an unsymmetrical chamber, said chamber resting on ball-bear- 20
ings, with a collar and ball-bearings encircling said steam-pipe, and a counterweight on the shorter side of said chamber, substantially as shown and described.

HERBERT ALLEN WHEELER.

Witnesses:

F. CLARK,

F. HENDERSON.