(No Model.) 2 Sheets—Sheet 1.

F. A. HINE.

SEPARATOR.

No. 381,374. Patented Apr. 17, 1888.

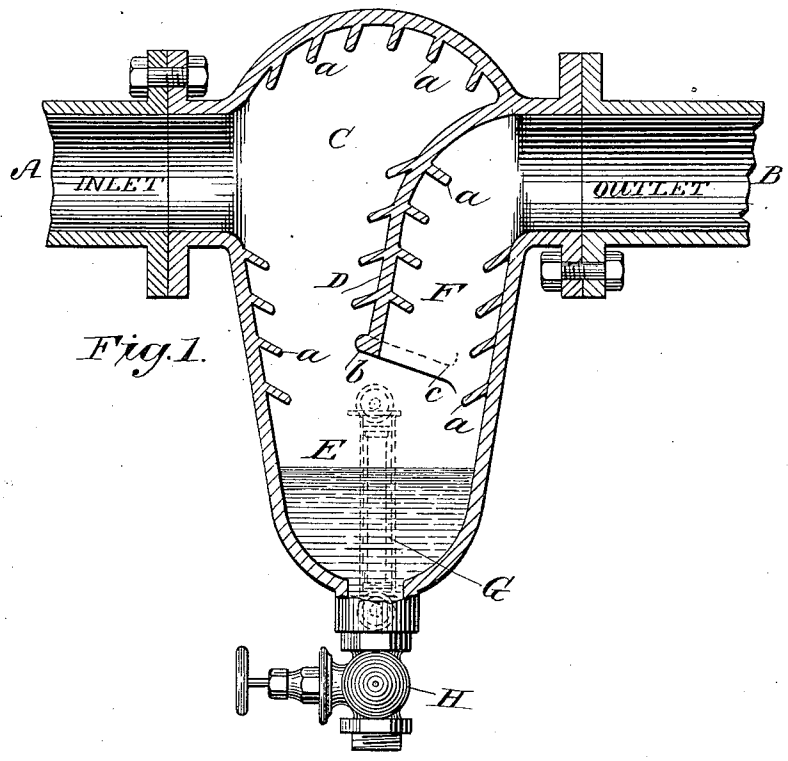


Fig. 1.

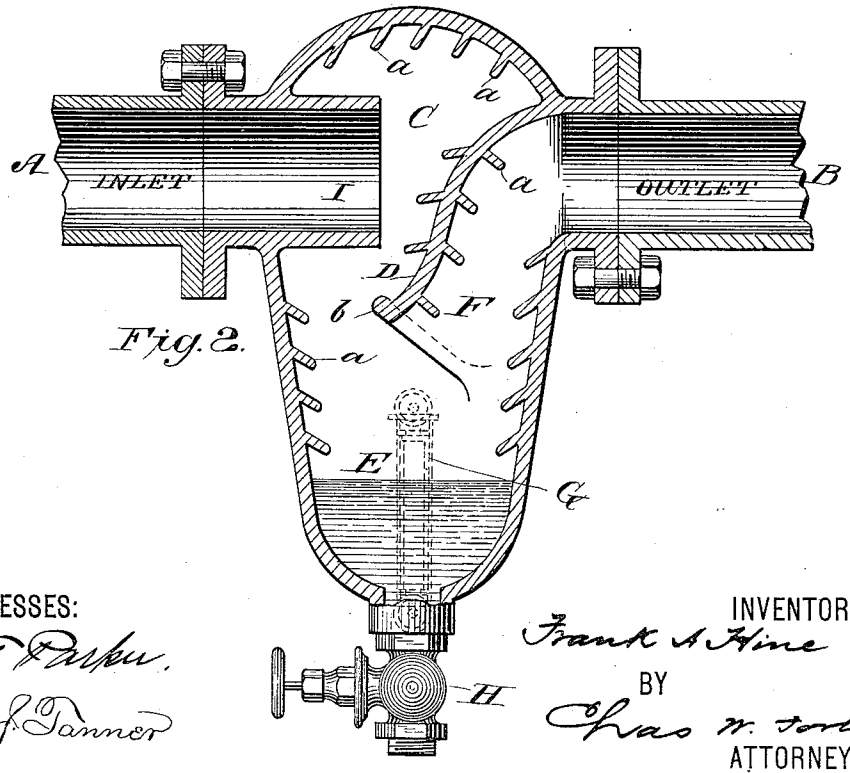


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

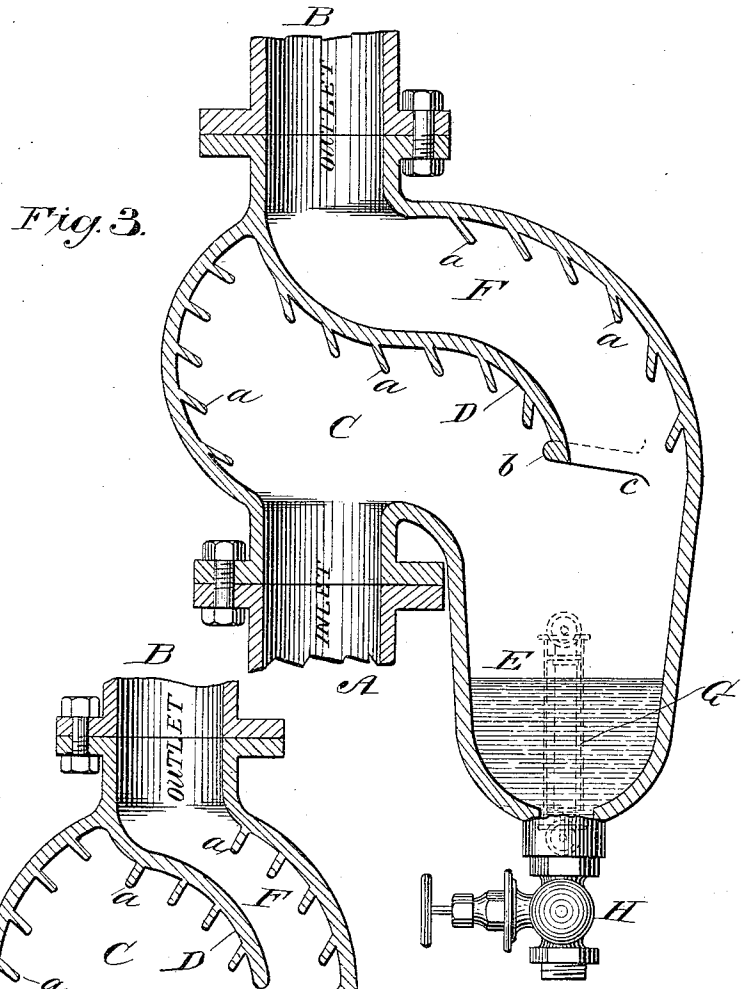
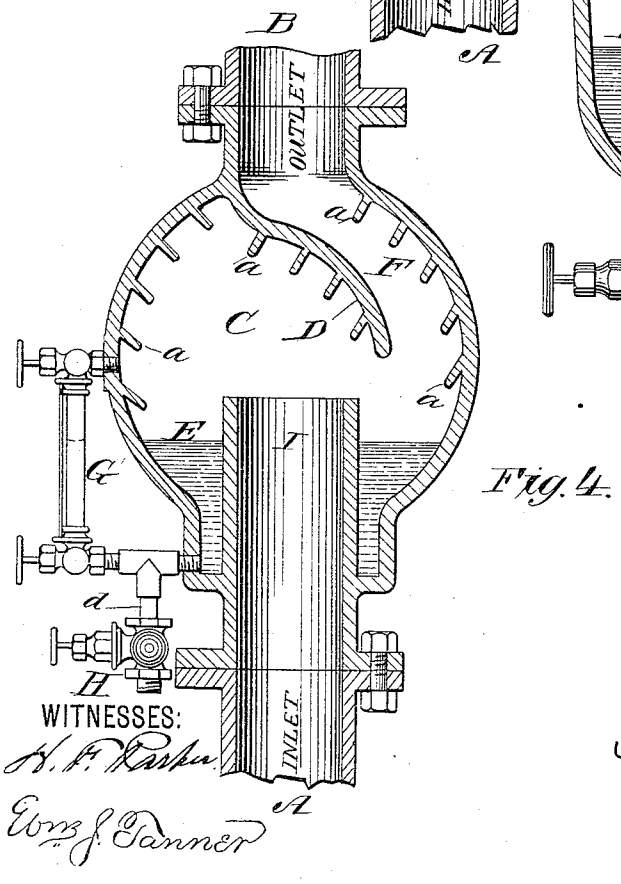


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK A. HINE, OF TENAFLY, NEW JERSEY.

SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 381,374, dated April 17, 1888.

Application filed December 6, 1887. Serial No. 257,151. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. HINE, a citizen of the United States, residing at Tenafly, county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Separators, of which the following is a specification.

This invention relates to the treatment of live steam or exhaust-steam, but particularly the latter; and the object of the apparatus is to separate oil, grease, grit, or condensed portions of the steam therefrom.

The apparatus is applicable to either a horizontal or vertical line of pipe; and the same consists of a shell or casing interposing said pipe, and having a well or pocket in the lower portion thereof for the reception of the particles of separation which are thrown down by deflection of the current in a manner hereinafter particularly described and claimed.

In order to enable others to understand and use my said invention I will proceed to describe its construction, instance certain modifications within the scope of the invention, and point out in the appended claim its novel characteristics.

Referring to the accompanying drawings, Figure 1 is a vertical sectional view of a separator adapted for horizontal pipe; Fig. 2, a similar view of a modification thereof; Fig. 3, a vertical sectional view of a separator adapted for vertical pipe, and Fig. 4 a similar view of a modification adapted to the same purpose.

A is the inlet, and B the outlet, pipe in each of the several figures, the chamber C being the receiving-chamber separated from the outlet by the depending partition D, the same constituting a downward interprolongation of the outlet-pipe.

Beneath the partition or curtain D the well E is located at the point at which the deflected current reverses, whereby the heavier foreign particles or condensed portions aforesaid are deposited by gravity.

The main impurities are arrested in chamber C, especially by aid of the retarding projections *a*, consisting of ridges disposed about the surface substantially at right angles to the direction of current, at suitable points, preferably those shown, and having a slight pitch as they appear in section, which will shed the oily liquid or other heavy particles arrested by them and carry such particles out of the center of current that they may flow to the well by gravity.

The portion F of the outlet-pipe B within the curtain D is also provided with similar ridges, inclined (as in vertical cross-section) toward the outgoing current, whereby the complete service of the apparatus is still further insured, and any finer particles that may remain in suspension are caught and returned to the well E, the ridges acting to create cross-currents and counter-currents of the steam upon the surface. The ridges throughout also act to prevent flowing of the liquid on the metal surface toward the point of exit, at which they would otherwise be again taken up and carried in suspension. For the latter purpose a lip or bead, *b*, is also provided at the lower edge of the partition or curtain D, adapted to carry liquid particles off to the sides of the chamber C to points *c*, from whence they gravitate to the bottom with comparative freedom.

G is a liquid-gage to indicate the contents of the well, from which latter the accumulation is removed at suitable intervals (or constantly) by means of a suitable valve, H, and pipe connected thereto.

In Fig. 2, the inlet A extends inward over the curtain D by the extension or nozzle I, said curtain being also extended beneath to underlap the nozzle I to further break the directness of current. The same principles apply to Figs. 3 and 4 for the vertical pipe, the modification therein consisting in locating the well differently to suit the position of the apparatus and bring said well below the curtain D. In Fig. 4 the well E is annular, surrounding the upwardly-projecting nozzle I of the inlet-pipe A, the drainage of said well being effected by the pipe *d* and cock H, connected at one side, as shown.

I claim as my invention—

The combination, with the shell or casing to be inserted in a line of pipe, a depending partition, and a well beneath said partition, of ridges, as shown, projecting from the interior surfaces of said shell at points where the force of the steam-current is received or deflected, said ridges being disposed transversely to the currents, whereby the heavier particles are separated therefrom.

Witnesses: FRANK A. HINE.
H. F. PARKER,
WM. J. TANNER.