(No Model.)

# S. STUART.

## SEPARATOR.

No. 403,704. Patented May 21 1889.

Fig 1.

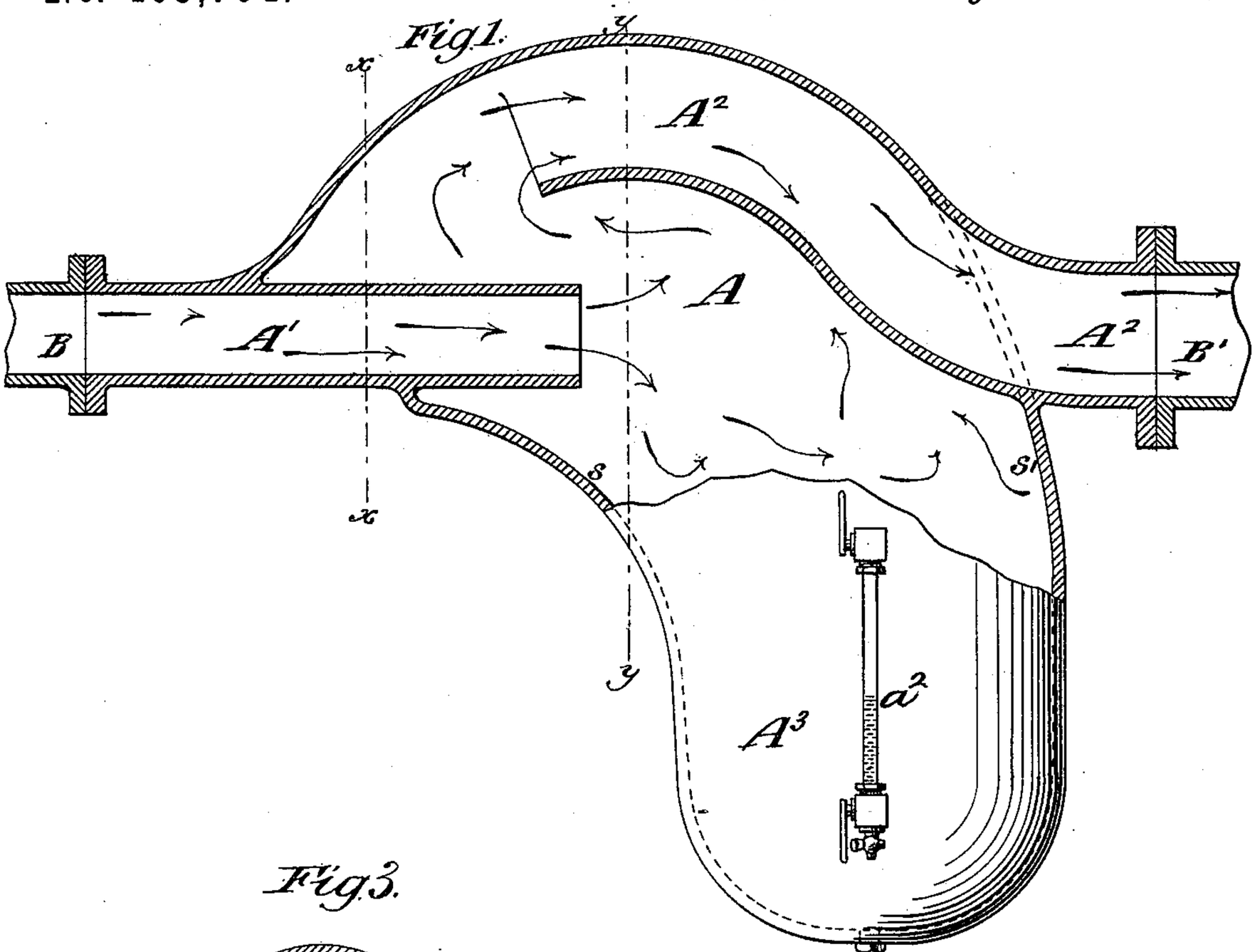



Fig 3.

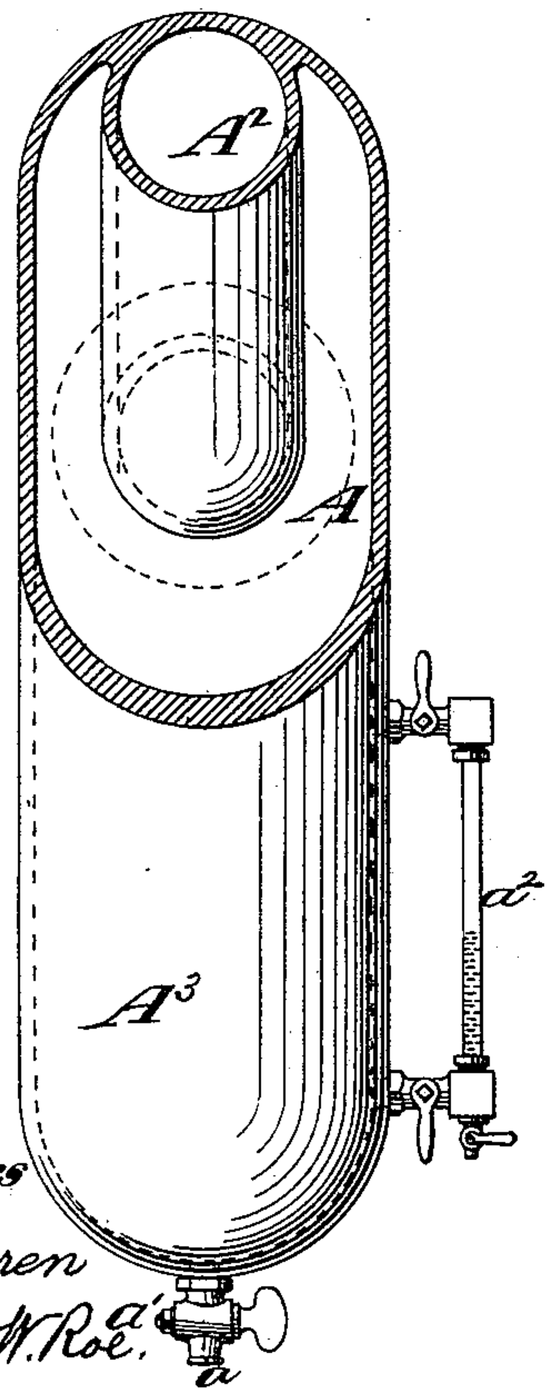
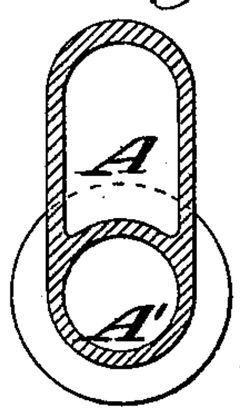



Fig 2.




Witnesses
C. L. Sundgren
Joseph W. Roe.

Inventor:
Sinclair Stuart
by his atty
Brown & Race

# UNITED STATES PATENT OFFICE.

SINCLAIR STUART, OF PLAINFIELD, NEW JERSEY.

## SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 403,704, dated May 21, 1889.

Application filed December 20, 1887. Serial No. 258,459. (No model.)

*To all whom it may concern:*

Be it known that I, SINCLAIR STUART, of Plainfield, in the county of Union and State of New Jersey, have invented a new and useful Improvement in Separators for Steam-Pipes, of which the following is a specification.

My invention relates to devices which may be placed in the line of steam-pipes for live steam, and by which the water carried over in suspension from the steam-boiler will be separated from the steam and collected, and which may be placed in the line of exhaust-pipes for separating from the exhaust-steam the oil and grease and also the water. It is advantageous to separate from the exhaust-steam the water of condensation if the exhaust-steam is to be used for supplying heating-radiators, and it is important to separate the oil and grease from exhaust-steam when used for heating purposes, in order that the grease shall not deposit in the heating-radiators and cause foul odors, and in all cases so that the grease shall not be returned to the condenser and steam-boiler and produce injury of such structures.

In my Letters Patent No. 362,191, dated May 3, 1887, I have shown and described an extractor consisting of a shell or body having catch-plates or abutments extending across it and a well communicating with its bottom, in which drain the oil and water separated by the abutments or catch-plates from the steam.

The invention will be hereinafter particularly described, and pointed out in the claim.

In the accompanying drawings, Figure 1 is an elevation, partly in section, of a device embodying my invention, and more particularly intended for use in horizontal steam-pipes; and Figs. 2 and 3 are transverse sections respectively in the planes indicated by the dotted lines $x\ x$ and $y\ y$, Fig. 1.

Similar letters of reference designate corresponding parts in the several figures.

A designates the body or chamber of the separator, having at opposite ends inlet and outlet branches A′ A², which are here shown as in line with each other, so that the device may be inserted in a straight line of live-steam or exhaust piping. With the inlet branch A′ is connected the inlet-section B of the steam-pipe, and with the outlet branch A² is connected the outlet-section B′ of such pipe.

The main chamber A is prolonged downward or to one side of the line of the inlet and outlet, so as to form a well, A³, and toward this well the walls of the main chamber A incline, so that liquid deposited on such walls will flow easily to the well A³ and there deposit. From the well A³ extends an outlet-pipe, *a*, provided with a valve, *a′*, through which the water and oil may be drawn off, and said well may also have applied to it a gage-glass, *a²*, for indicating the level of water or water and oil therein.

I have shown the outlet branch A² as prolonged within the main chamber A and starting from a point near the top thereof, so that steam to escape from the chamber must rise above the level at which it enters thereinto, and I have also shown the inlet branch A′ as prolonged in the chamber somewhat beyond the inner end of the outlet branch A², so that the entering steam will not pass directly from one to the other.

Steam entering at A′ instantly expands, and thereby has its velocity checked and its current broken, and the water and oil in suspension are permitted to deposit by the force of gravity and flow down the inclined wall *s* to the well A³, and in like manner any particles of water and oil striking the farther wall, *s′*, flow down to the well. In its expanded condition the steam must rise to the top of the chamber A to escape therefrom, and in order that the velocity of its exit may be less than its inlet I have shown the outlet branch A² as considerably larger than the inlet branch A′. The separator is made of cast metal, all the parts being cast in one integral piece.

When the extractor is applied in an exhaust-pipe which communicates with a condenser and wherein a vacuum is to be maintained, the outlet *a* may have applied to it a discharging-chamber, also having a valved outlet, as shown in my aforesaid patent, and then the well B² may be discharged without interfering with and notwithstanding the vacuum in the chamber B′.

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

A separator comprising an inlet branch and

an outlet branch, a chamber into which both said branches extend, the outlet branch being of larger diameter than the inlet branch and having its opening in the chamber above the opening for the inlet branch, and a well below both said branches, said chamber being provided with walls inclined toward the well and the whole being cast in one integral piece, substantially as specified.

SINCLAIR STUART.

Witnesses:
C. HALL,
FREDK. HAYNES.