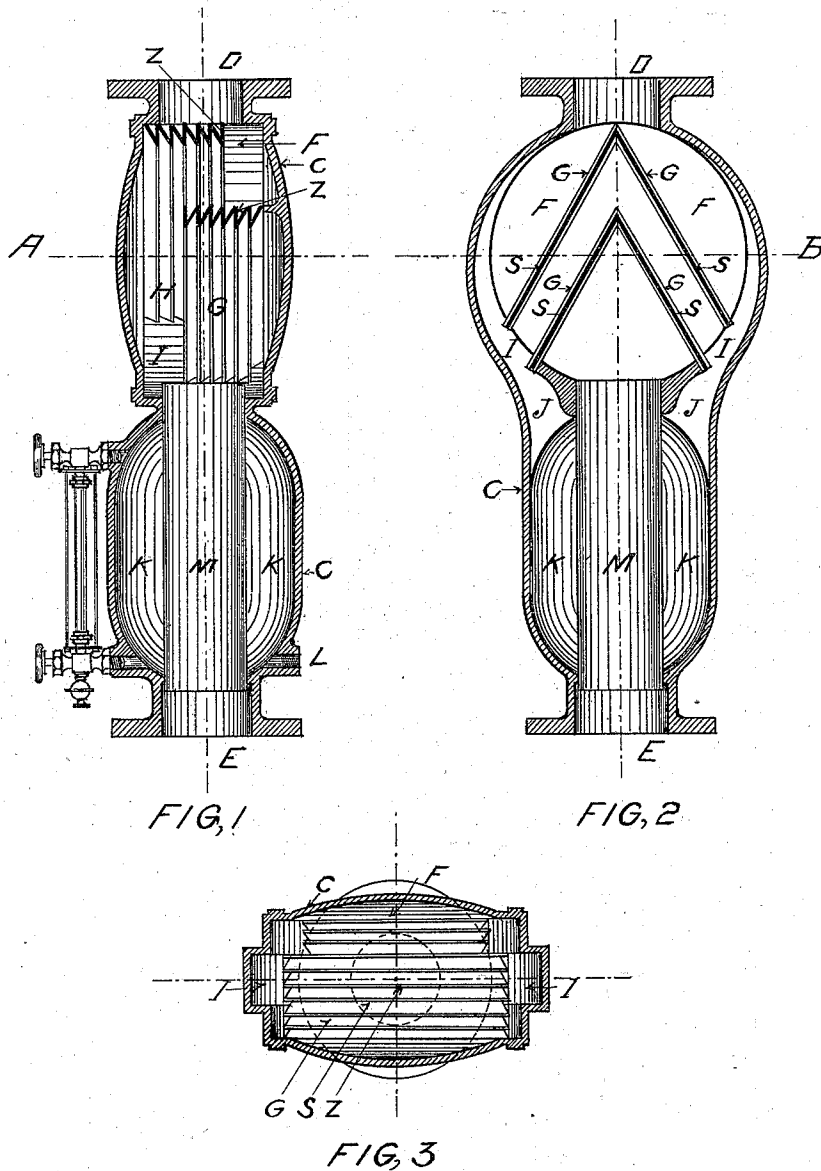


(No Model.)

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STEAM PURIFIER AND SEPARATOR.

No. 552,593.

Patented Jan. 7, 1896.



WITNESSES:

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STEAM PURIFIER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 552,593, dated January 7, 1896.

Application filed October 25, 1894. Serial No. 526,987. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. STEPHENS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Steam Purifiers and Separators, of which the following is a specification.

This invention relates to devices for purifying live or exhaust steam by separating and removing therefrom entrained water, oil, grit and other impurities.

The objects of the invention are to accomplish such purification while at the same time maintaining a direct, undivided and continuous passage for the current of steam; to so arrange the surfaces upon which the foreign substances are caught as to reduce the friction and resultant loss of pressure due to the division of the current of steam and its passage through devious or winding passages, and to obtain perfect separation of the impurities from the steam and their removal by the pressure of the steam itself.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of my improved separator. Fig. 2 is a central vertical section at right angles to the line of section in Fig. 1, and Fig. 3 is a cross-section on the line A B in Figs. 1 and 2.

In the drawings, C represents the casing or shell having inlet and outlet openings D and E respectively.

F is the separating-chamber containing the separating-plates G. These consist of two or more serrated plates so arranged as to present a cuneal edge to the incoming current of steam. These plates are attached to opposite sides of the interior of the casing, extending partially across the same, and are sufficiently less in width than the width of the separating-chamber to allow a free passage for the steam around the edges and between the plates, as shown at H. The serrated surfaces of the plates are so arranged as to present a series of surfaces Z at right angles to the direction of the flow of the steam, so as to separate therefrom any entrained water, grease or grit which may be contained therein, and prevent the same from passing along with the steam over the serrations. The im-

pact and momentum of the impurities forced along by the steam induces a current down the grooves of the plates at an acute angle to the direction of the current of the steam. These impurities are therefore forced along by the pressure of the steam and pass off the lower edges of the plates at I into the passages J below the separating-chamber. The flow of steam thus aids in the removal of the impurities, which are caught by the edges of the serrated plates, and the flow of steam is not materially impeded. In other words, on account of the acute angle at which the serrated plates are presented to the direction of the flow of steam, the action of gravity is assisted by the pressure of the steam, and after reaching the edges I of the plates are forced by this same pressure through the passages J into the chamber K, whence they are drawn off through the outlet at L. The steam after passing the separating-surfaces enters the steam-pipe M and continues its course. The centrifugal action induced by the change of direction of the current of steam in passing between the two sets of plates also assists in the removal of the impurities. The steam is spread out in a thin layer or ribbon-shaped current and the direction of the current is such that its opposite sides are alternately presented to the serrated surfaces. This is materially assisted by the drum form of the casing, since the current is confined between the casing and the serrated plates.

I claim as my invention—

1. In a steam separator, a casing having inlet and outlet openings, a series of serrated plates arranged in V-form between said openings, the said plates being arranged at an acute angle to the direction of the flow of steam, and the said serrations having a vertical side presented toward the flow of the incoming steam, substantially as set forth.

2. In a steam separator a drum-shaped casing with inlet and outlet openings, having in its interior two or more sets of serrated plates alternately disposed, the said serrations being so formed and placed as to present one surface at right angles to the direction of the flow of steam, substantially as and for the purpose specified.

3. A steam separator consisting of a casing

having inlet and outlet openings, a drum-
shaped separating chamber containing cuneal
shaped serrated plates attached to alternate
sides of the casing at an acute angle to the
5 flow of steam, a receiving chamber surround-
ing the said plates and passages around the
serrated surfaces connecting the separating

chamber with the receiving chamber, substan-
tially as described.

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Witnesses:

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