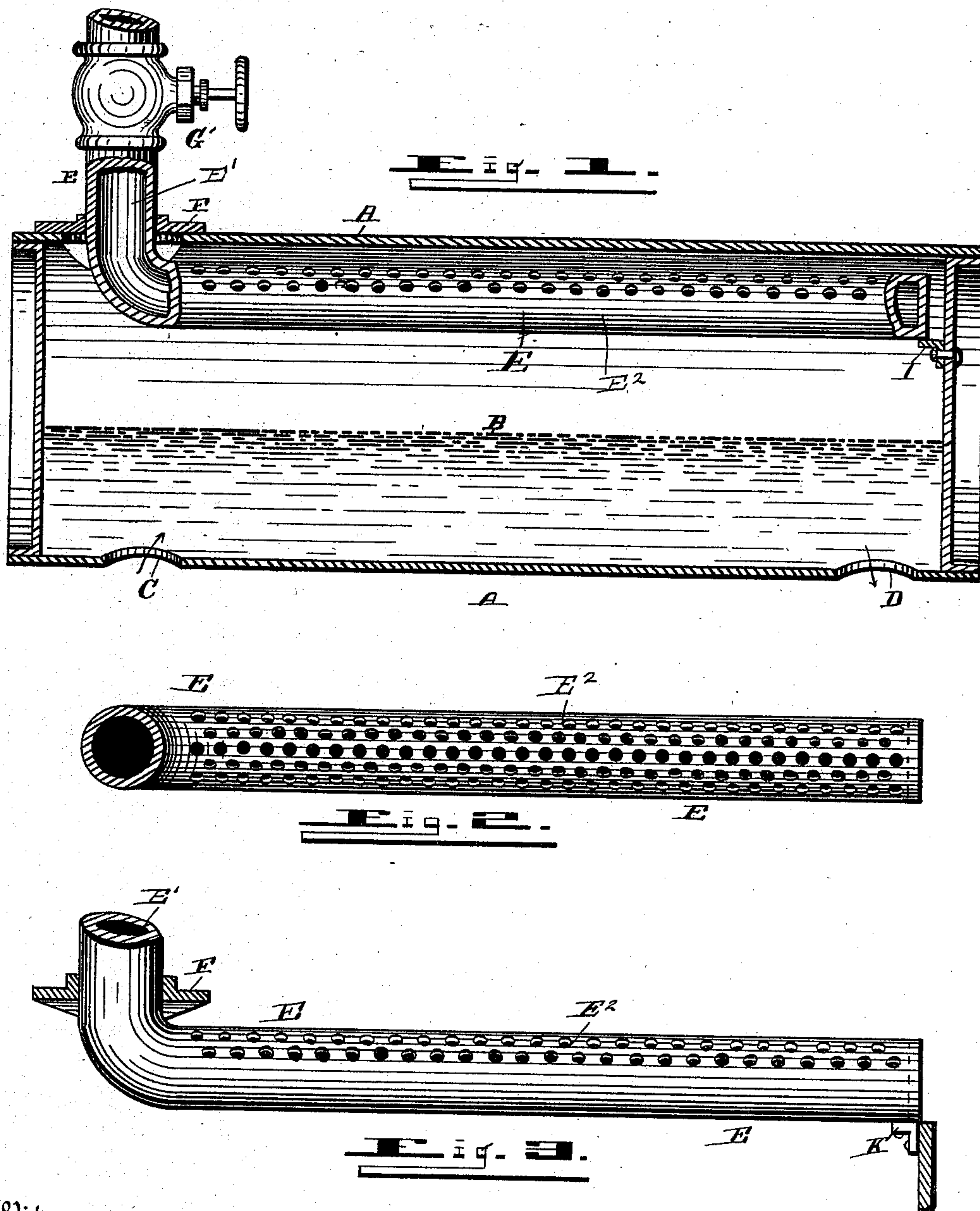


(No Model.)

V. W. BLANCHARD.  
STEAM DRUM.

No. 413,918.

Patented Oct. 29, 1889.



Witnesses

P. L. Brooks-

A. E. Towell.

Inventor

Virgil W. Blanchard

By his

Attorney W. H. Alexander



# UNITED STATES PATENT OFFICE.

VIRGIL W. BLANCHARD, OF NEW YORK, N. Y., ASSIGNOR TO JOSEPH A. DAVIS, OF SAME PLACE.

## STEAM-DRUM.

SPECIFICATION forming part of Letters Patent No. 413,918, dated October 29, 1889.

Application filed April 12, 1889. Serial No. 306,974. (No model.)

*To all whom it may concern:*

Be it known that I, VIRGIL W. BLANCHARD, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Steam-Drums; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a diametrical section through a steam-dome showing my improved steam-tube applied above the water-space. Fig. 2 is a top view of the perforated tube, and Fig. 3 is a side view of the said tube without the steam-dome.

The object of this invention is to so construct the steam dome or drum of a steam-boiler that the dome will be free from the usual tendency to "prime" or foam, and also to insure the delivery to the engine of dry steam, which will be taken from the steam-space the entire length thereof, thereby delivering to the engine steam which is practically uniformly heated.

The following is a description of my invention:

A designates a steam-dome provided with apertures C and D, which communicate with a steam-generator below—such, for instance, as is shown in my Letters Patent numbered 289,962. The water-line is indicated by the line B.

E designates a steam-pipe which is formed with a short vertical portion E' and an angular bend or leg E<sup>2</sup>, portion E' being provided with a flange F, located on the exterior of the drum and suitably secured thereto. Leg E<sup>2</sup> extends nearly the entire length of the dome above the water-line. It will be observed that the upper surface of the leg E<sup>2</sup> is provided with minute holes, which include about one-third of its peripheral surface. The free extremity of the steam-drum is closed, and the opposite end passes out of said drum and is provided with a cock G'.

It will be observed that by means of the flange F a steam-tight joint is formed between the steam-pipe E and the steam-drum

A; also, that I leave the extremity of this pipe free to slip on a bracket I.

In lieu of the bracket I, an angle-iron may be secured to the free end of the leg E<sup>2</sup> and connected to the head of the dome A by a plate or lug, as indicated in Fig. 3.

By reference to Fig. 2 it will be seen that the minute holes in the upper part of the steam-leg E<sup>2</sup> extend the entire length of said leg E<sup>2</sup>. It is desirable that the said perforations should not exceed one-eighth of an inch in diameter, and also that their aggregate diameter should be less than the interior area of the steam-pipe after it emerges from the drum A below the cock G'.

By attaching the leg K to the steam-pipe, as shown in Fig. 3, and by cutting a large aperture in the steam-drum A, to be closed by the flange F of corresponding size, I am able to apply my invention to steam-boilers now in use, for the reason that the steam-pipe E may be inserted into the steam-drum and a steam-tight joint formed, as above described.

It is obvious that pipe E, being angular, can be removed from the shell A and returned when desired, because the aperture through said shell is of greater diameter than the pipe, which aperture is closed by a broad flange F, as described, so applied to the shell that it can be removed and replaced.

In the practical operation of my invention, should water from the heating-tubes be ascending in a current in the direction of the arrow through the aperture C into the steam-drum A and descending in the direction of the arrow through the aperture D, there will necessarily be a constant and uniform circulation. At the water-line B the steam is given off, and it is conducted from the highest part of the drum A through numerous fine apertures into the pipe E throughout its length, from whence it is carried off to the engine as dry steam.

From the foregoing it will be seen that I have applied in a steam-dome above the water-line and as near as possible to the top of the said dome a tube which is allowed to expand and contract freely, and which is provided with numerous small holes throughout its entire length, said holes being arranged in



the upper part of the tube. The lower part being imperforate, I thus take away from the highest part of the steam-space the steam in a practically dry state.

5 It will be observed from the foregoing that the steam is taken in minute jets in a downward current from the top of the steam-drum, where it is dryest, and along the entire length of the leg, thereby preventing any local up-  
10 lifting or "spraying" effect on the water beneath from suddenly opening wide the throttle-valve, or from the subsequent intermittent flow of steam to the engine. As the pipe-leg is perforated above its longitudinal  
15 axis, only the lowest part, which is imperforate, is liable to accumulate scale and deposits, which it is necessary to remove at times; hence I make the hole through the shell of the dome large enough to admit of  
20 the removal of said pipe.

Having described my invention, I claim—

1. The combination of a steam-dome of a boiler with an angular pipe having a horizontal leg entering the upper part of the dome  
25 and numerous perforations above its horizontal axis in said dome, and a vertical portion

extending through the dome-shell and provided with a throttle-valve and a flange and a support for the inner end of said leg, all substantially as and for the purpose specified. 30

2. The combination, with a steam-drum, of a pipe which is perforated on its upper part and which is sustained at both ends, substantially as described, whereby it is allowed to expand and contract freely, and having an  
35 angular end extending through an opening in the drum, substantially as set forth.

3. The combination of the steam-drum A, the pipe E, perforated, as described, and bent at one end, the steam-cock applied to said  
40 pipe, and the flange connecting the said pipe to the drum A, and the support for the free end of the pipe within the drum, all constructed and arranged as and for the purpose specified. 45

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

VIRGIL W. BLANCHARD.

Witnesses:

ALEX. S. STEUART,

P. L. BROOKS.