

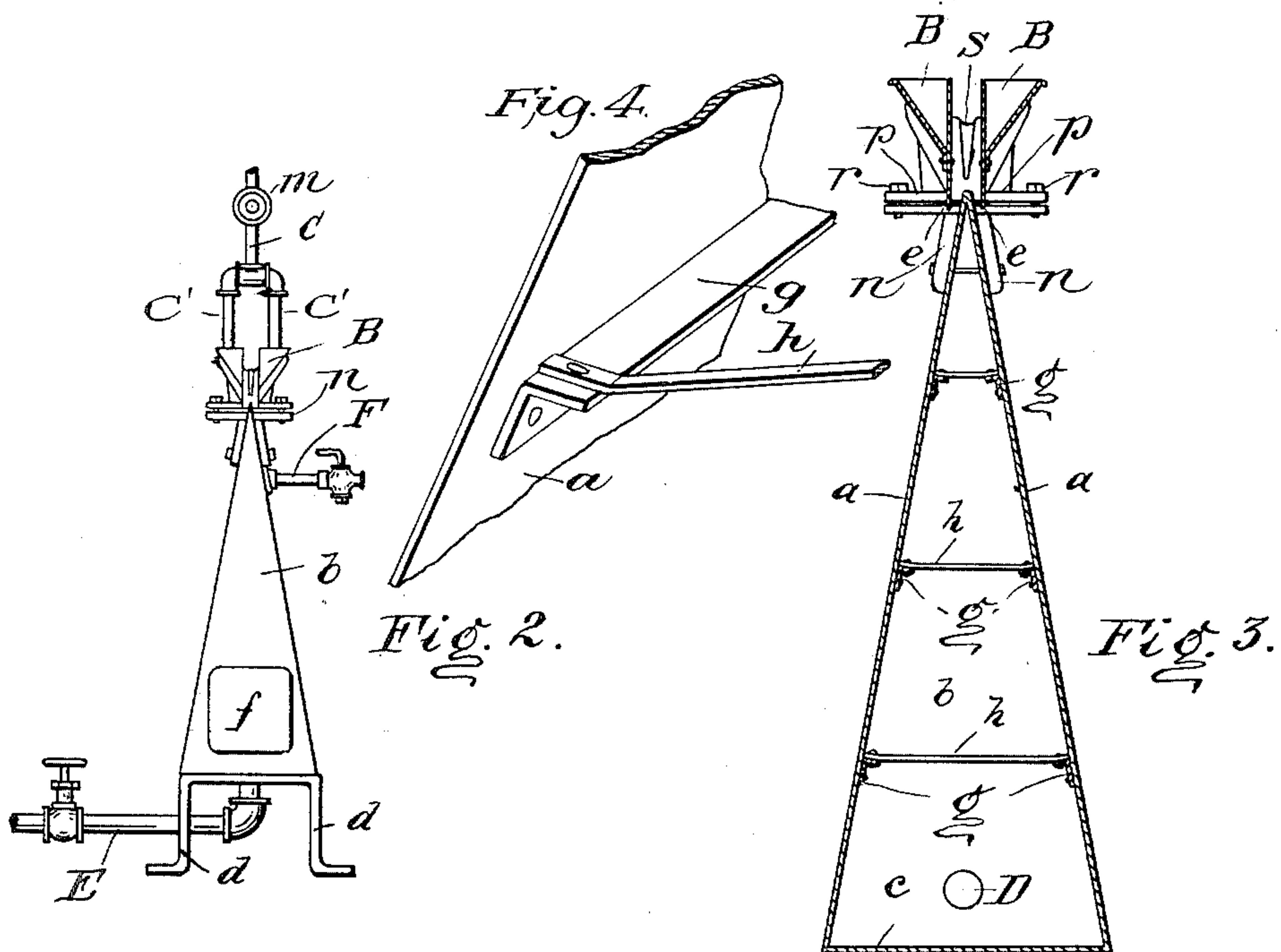
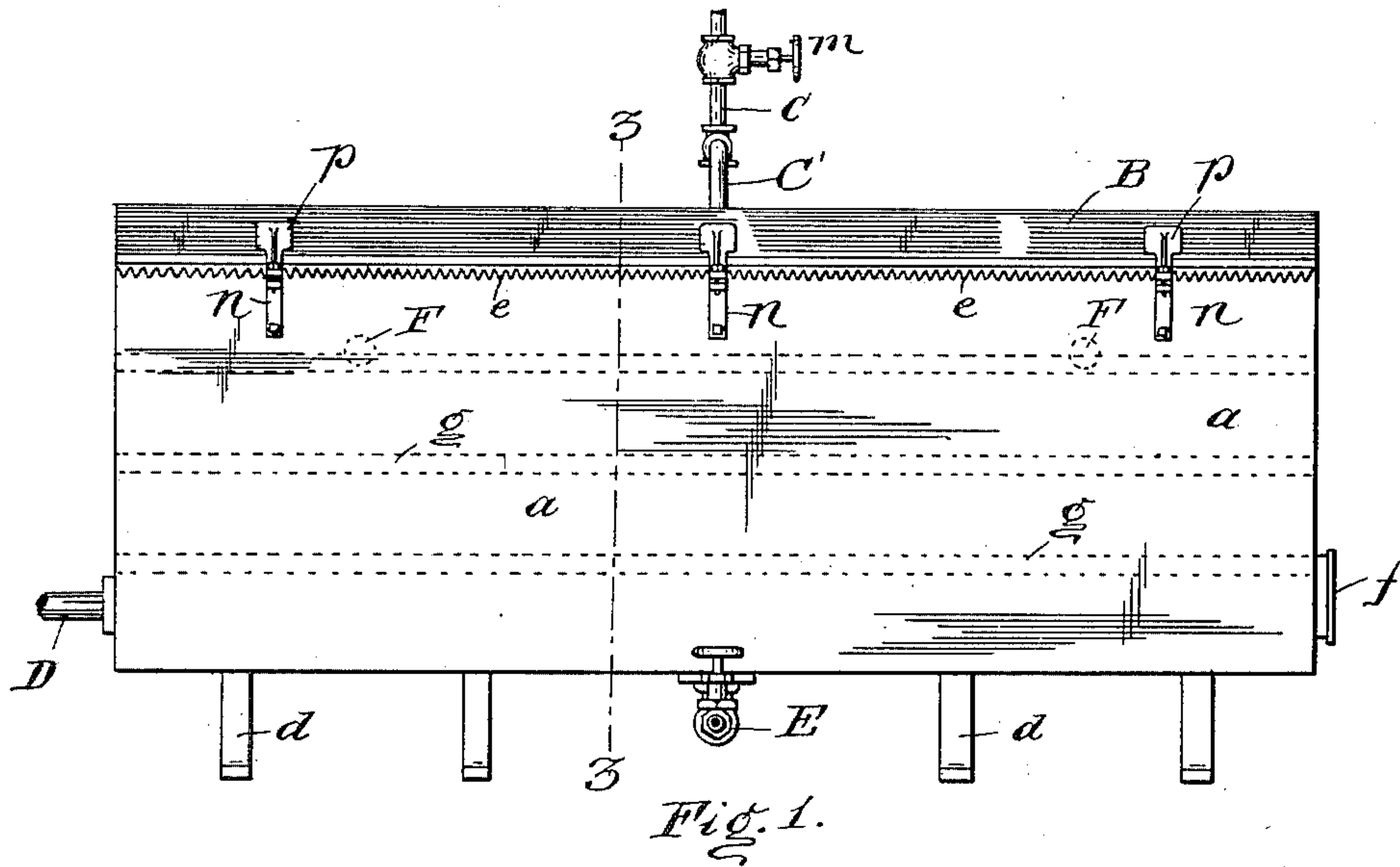
No. 659,831.

Patented Oct. 16, 1900.

W. A. SCHMID.
SURFACE STEAM CONDENSER.

(Application filed Feb. 16, 1900.)

(No Model.)



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SURFACE STEAM-CONDENSER.

SPECIFICATION forming part of Letters Patent No. 659,831, dated October 16, 1900.

Application filed February 16, 1900. Serial No. 5,436. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. SCHMID, a citizen of the United States, residing at Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and useful Improvements in Surface Steam-Condensers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvements relate to condensers for steam in which the condensation is obtained by subjecting the receptacle for the steam to a bath of cold water; and it consists in certain improvements in the construction of the receptacle to be hereinafter particularly pointed out and claimed.

In surface condensers as heretofore frequently constructed the steam is condensed in coils of pipes or some other shallow receptacle submerged in a bath of cold water and the surface of the steam-receptacle is difficult of access. It frequently happens that hard water must be used to effect the condensation, and as a result scale readily forms on the outside surface, which must be frequently removed to maintain the apparatus in proper working condition. This removal of scale is a difficult and tedious process in the ordinary apparatus, and it is the purpose of my invention to furnish a condenser all sides of which will be easily accessible for the removal of scale. In addition to this for many purposes it is intended to use the water of condensation either for the steam-boiler or in the manufacture of ice for reboiling to purify same for the ice-cans. My apparatus is designed so that the water of condensation when drawn from the condenser shall be at an extremely high temperature, almost at the boiling-point, so that little heat is required to again convert this water into steam.

In the drawings, Figure 1 is a front elevation of my apparatus. Fig. 2 is an end elevation of same. Fig. 3 is a central vertical cross-section of same, taken on line 3 3 of Fig. 1.

The steam-receptacle is triangular in cross-section, constructed out of suitable sheet-metal plates, bolted and riveted together at the edges, and made up of sloping sides *a a*, ends *b b*, and a bottom *c*. For convenience

the receptacle is supported from the floor by standards *d d*.

B B are two V-shaped troughs for distributing an even flow of cold water over the sloping sides of the receptacle. The water is supplied to the troughs through the cold-water pipe *C*, with its two branches *C' C'*. The supply of water is controlled by the valve *m*, and when it is desired to flow the water over the sloping sides of the condenser the valve *m* is opened and water allowed to run into the troughs. The troughs first fill up, and the water then overflows the troughs and runs down both sides of the trough. The troughs are supported in a fixed position over the apex of the condenser by brackets *n n p p*, one set of brackets *n n* bolted to the sloping sides *a a* and the other set *p p* bolted to the troughs, and the two then bolted together by bolts and nuts *r r*. The troughs are thus supported back to back and separated by the casting *s*, one trough over the upper edge of each of the sloping sides *a a* of the condenser. Along the bottom edge of each trough is secured a serrated plate *e*, running from end to end of the trough on the bottom and outside. Now it is evident that when the water is turned on through pipe *C* and allowed to run after the troughs are full the water will overflow and run down the sides of the troughs, and that the serrated edge at the bottom will assist to distribute this overflow over the sloping sides *a a* of the receptacle.

The steam is supplied to the condenser through the inlet-pipe *D* and the water of condensation is withdrawn through outlet-pipe *E*. Both of these pipes are controlled by suitable valves. For convenience of access to the steam-receptacle a manhole *f* is also provided in one end. The cooling-water from the trough *B* after flowing down the sides of the condenser is collected in any convenient way, such as by standing the condenser in a suitable shallow vessel to catch the water.

Riveted to the inside of the sloping sides *a a* of the condenser on each side are a series of angle-iron plates *g g*, arranged horizontally from end to end of the condenser, and the sides are suitably braced together by the cross-braces *h h*, connecting at suitable points to obtain the necessary rigidity with the op-

posite angle-plates. When the steam is admitted to the condenser through pipe D and the cooling-water is distributed, as described, over the sloping sides, the steam condenses and runs down inside until it meets an angle-plate *g*, when it flows off the inner edge of the plate and drops to the bottom. The cross-braces *h h* also serve to distribute the water of condensation toward the center of the receptacle and allow it to drop to the bottom. In this way instead of the water of condensation becoming cooled by long-continued contact with the cool sides of the condenser, as it would be in running from the top to the bottom of the receptacle, the water is collected very hot at the bottom. With my construction of apparatus also the condensing-surfaces are always exposed and entirely accessible and any formation of scale may be readily removed without any trouble or expense even with the apparatus in constant use. A large amount of surface is also constantly exposed to the cooling action of the water and the condensation of the steam within the receptacle is readily accomplished. To relieve the steam-pressure when necessary, I also provide the pipes F F, in which safety-valves can be mounted when desired.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A surface condenser for steam, consisting of a narrow steam-receptacle, provided with a bottom and with broadly-extending sides, acutely converging at the top, with angle-plates secured within to the sloping sides, and inclining inward and downward to prevent the water of condensation following the sides to the bottom, and causing it to flow off the edges of such angle-plates, and means for distributing an even flow of cold water from the outside of the condenser, substantially as shown and described.

2. A surface condenser for steam, consisting of a narrow steam-receptacle, provided with a bottom and with broadly-extending sides, acutely converging at the top, with angle-plates secured within to the sloping sides, and inclining inward and downward, and cross-braces connecting same, to give rigidity to the receptacle, and to prevent the water of condensation following the sides to the bottom, and causing it to flow off the edges of such angle-plates, and means for distributing an even flow of cold water from the outside of the condenser, substantially as shown and described.

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