No. 676,770. Patented June 18, 1901.

T. J. RAYNER.

EVAPORATING APPARATUS.

(Application filed Oct. 10, 1900.)

(No Model.) 3 Sheets—Sheet 1.

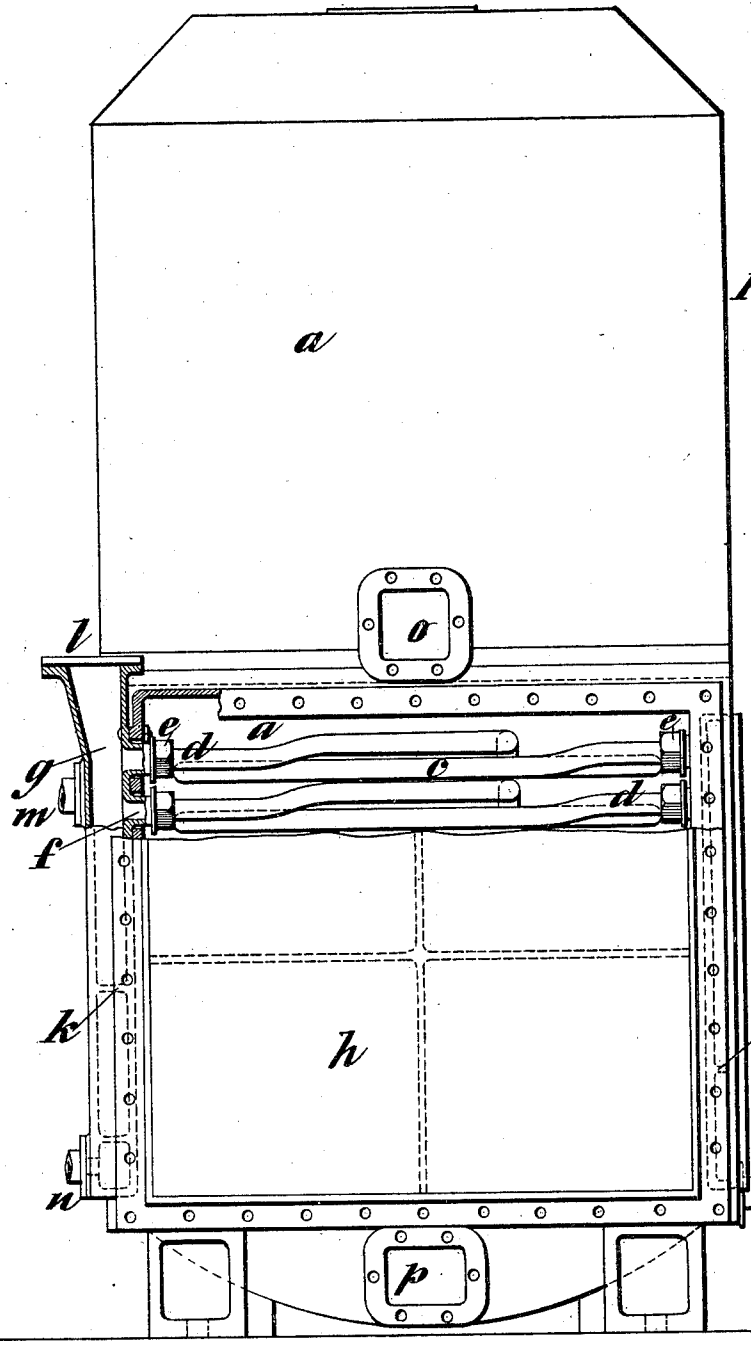


Fig. 1.

WITNESSES

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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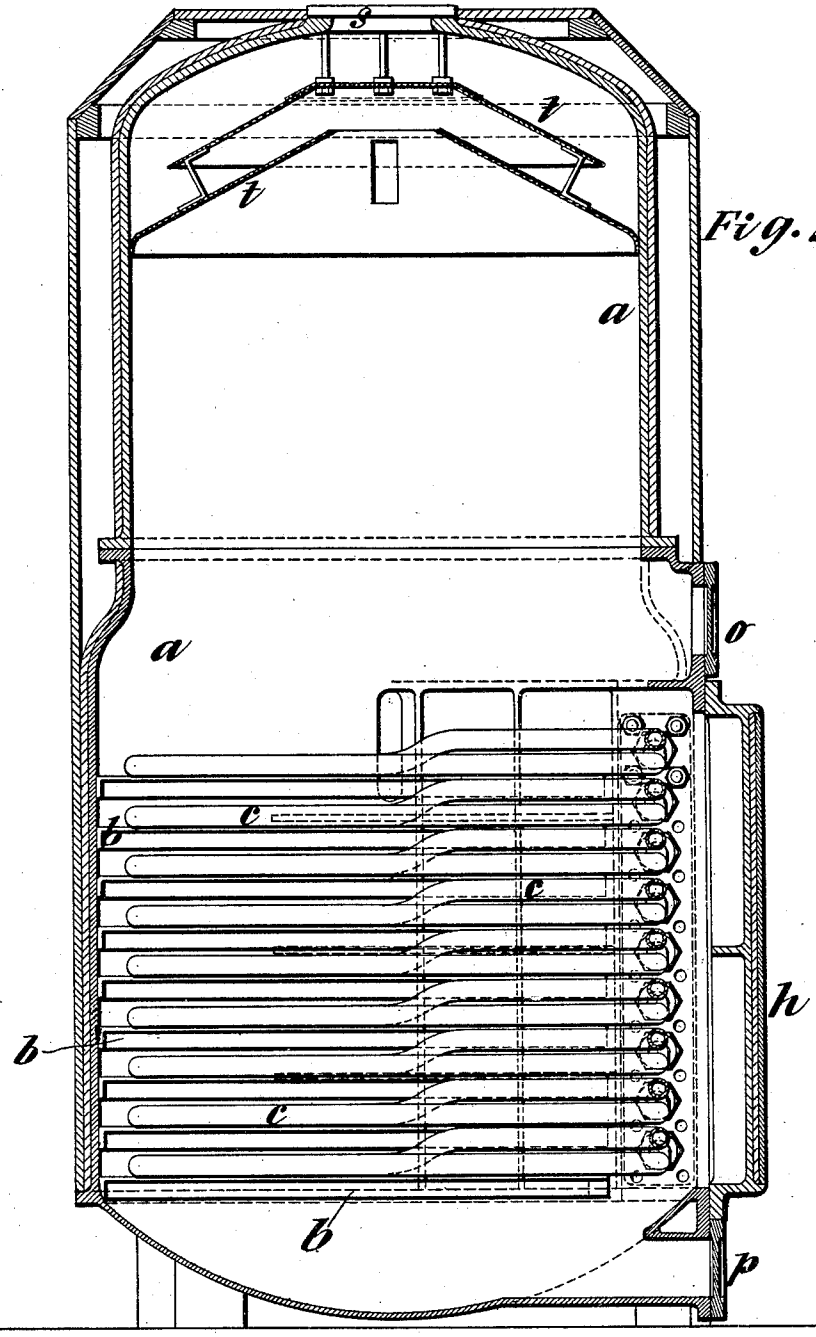


Fig. 2.

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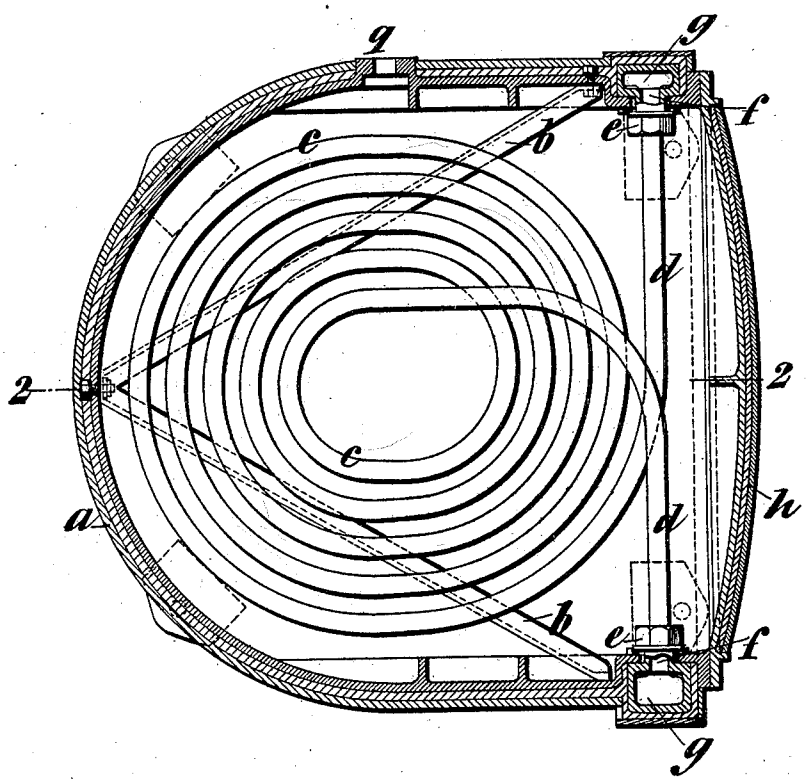
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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS J. RAYNER, OF LONDON, ENGLAND.

EVAPORATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 676,770, dated June 18, 1901.

Application filed October 10, 1900. Serial No. 32,621. (No model.)

To all whom it may concern:

Be it known that I, THOMAS JAMES RAYNER, a citizen of England, residing at 777 Commercial road, London, England, have invented a certain new and useful Improvement in Evaporating Apparatus, of which the following is a specification.

This invention relates to apparatus in which steam passing through volute coils immersed in water within a casing generates steam, which is condensed to supply fresh water for boiler-feeding or other purposes, and has for its object to facilitate the examination and repair of such apparatus and to permit the ready alteration of certain of its parts. For these purposes the apparatus is constructed as shown in the accompanying drawings.

Figure 1 is an elevation, partly in section. Fig. 2 is a vertical section on the line 2 2 of Fig. 3, which is a sectional plan.

In the drawings I show a vessel consisting of an inner wall of cast-iron *x*, with stiffening-ribs in portions thereof, as shown in Fig. 3, this having a covering *y* of a poor conductor, such as asbestos or similar fabric, and an outer casing of wood *z*. In the lower part of the vessel there are arranged a number of volute pipe-coils *c*, supported on oblique bearers *b*. Each coil *c* is so formed that both of its ends are brought forward to the front and terminate in straight parts *d*, which are fixed by nuts *e* to nozzles *f*, projecting from vertical channels *g*, which are preferably separate from but bolted to the vessel *a*, extending down outside of it. Obviously the ends of the coils *c* might be fixed by flanges to the channels *g*. A removable door *h* is also bolted to the front of the vessel *a*, covering the part occupied by the coils *c*. The vertical channels *g* are divided into several lengths by partitions *k*, so that the steam passing through the coils *c* is caused to travel through a number of the coils in the one direction and to pass back through others of them. The one channel *g* has an inlet *l* for exhaust-steam and another inlet *m* for steam from a boiler, and it has an outlet *n*, by which the water of condensation and such steam as may not be condensed pass to a condenser.

o is an inspection-door.

p is a clearing-door, and *q* is the inlet for the water which is to be evaporated.

At *r* there is an outlet for the brine, and at *s* an outlet protected by baffles *t* for the vapor generated. These baffles are designed to prevent priming, and the lower baffle, which is supported upon the upper, fits loosely against the inner face of the vessel, so that any water collecting upon it may trickle down over its edges. It is to be understood that the inlets and outlets are provided with suitable cocks or valves, which are not shown.

If on examination through the inspection-door *o* it is found that the apparatus requires cleaning or repair, this can be readily effected by removing the door *h*, when it can be seen if any of the coils *c* are leaking. The defective coil or coils can then by unscrewing the nuts *e* be readily taken out and repaired. The channels *g* may be made integral with the vessel *a*, but by making them separate from the vessel they can each be fixed at the side which is most suitable for connecting up with the passages for steam and water or they can be exchanged for other channels having partitions *k* arranged differently so as to vary the circulation.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

1. In evaporating apparatus a vessel arranged to contain the liquid to be evaporated, channels extending within the vessel, steam-pipes having detachable connections with said channels, and a door arranged to give access to the steam-pipes and allow them to be removed therethrough when disconnected from the channels; substantially as described.

2. In evaporating apparatus, a vessel arranged to contain the liquid to be evaporated and having an opening at one side, channels at each side of said opening, separate sections of pipe-coils within the vessel, and having detachable connections with the channels, and a door to close the opening, through which opening the pipe-sections may be removed and replaced; substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

THOMAS J. RAYNER.

Witnesses:
EDWARD GARDNER,
GERALD L. SMITH.