

D. LAIRD.
LIQUID HEATING FURNACE.

(Application filed Sept. 24, 1901.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

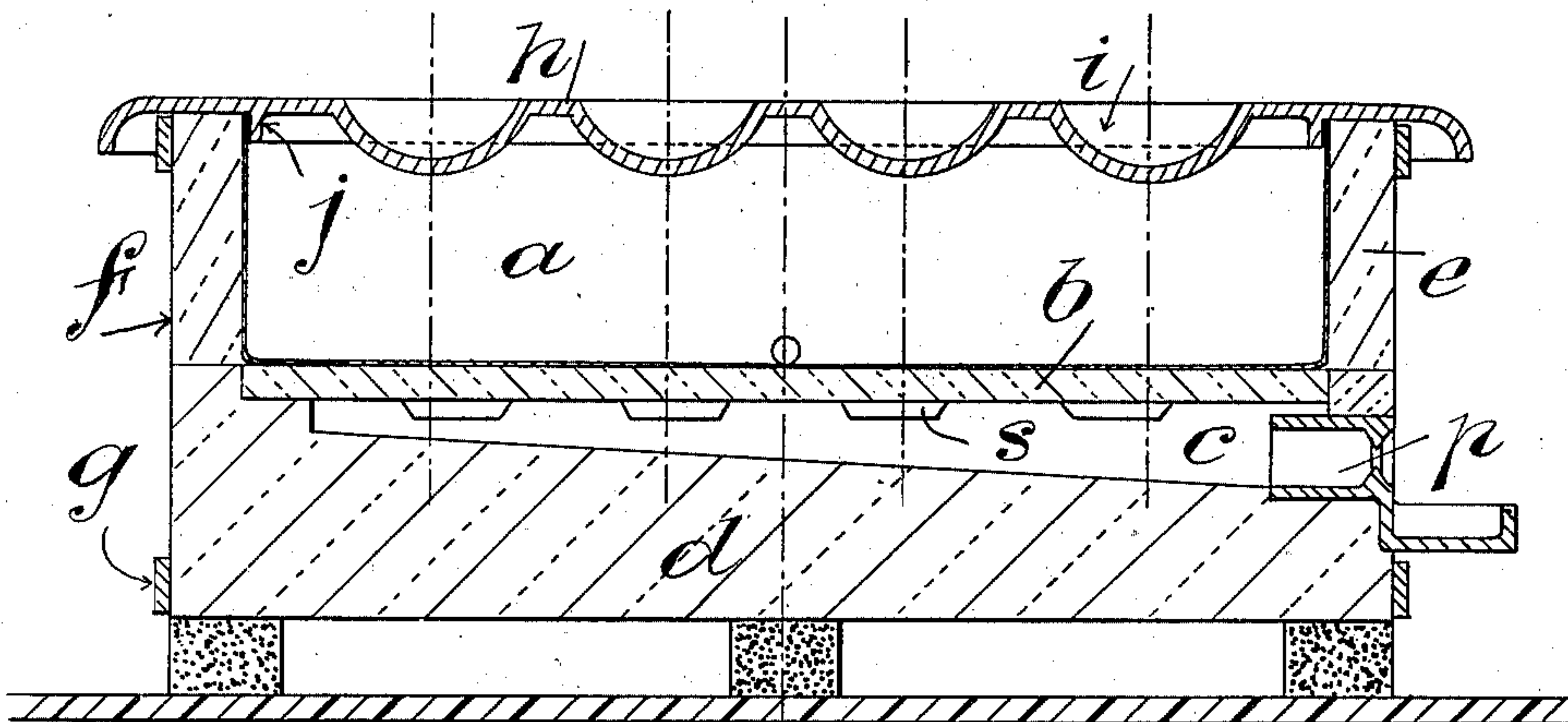
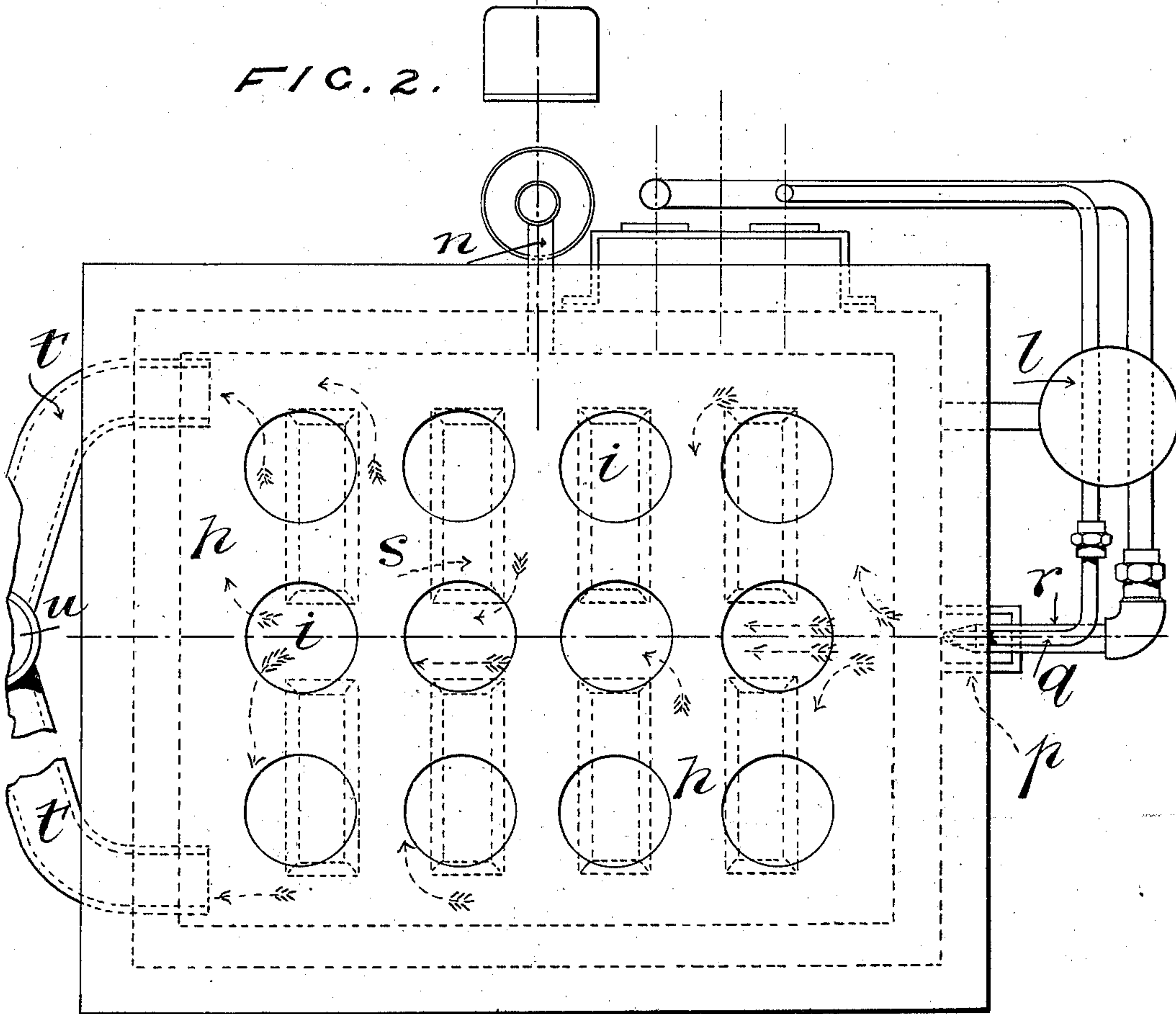


FIG. 2.



Witnesses
Isabella Waldron
Adelaide Claire Gleason

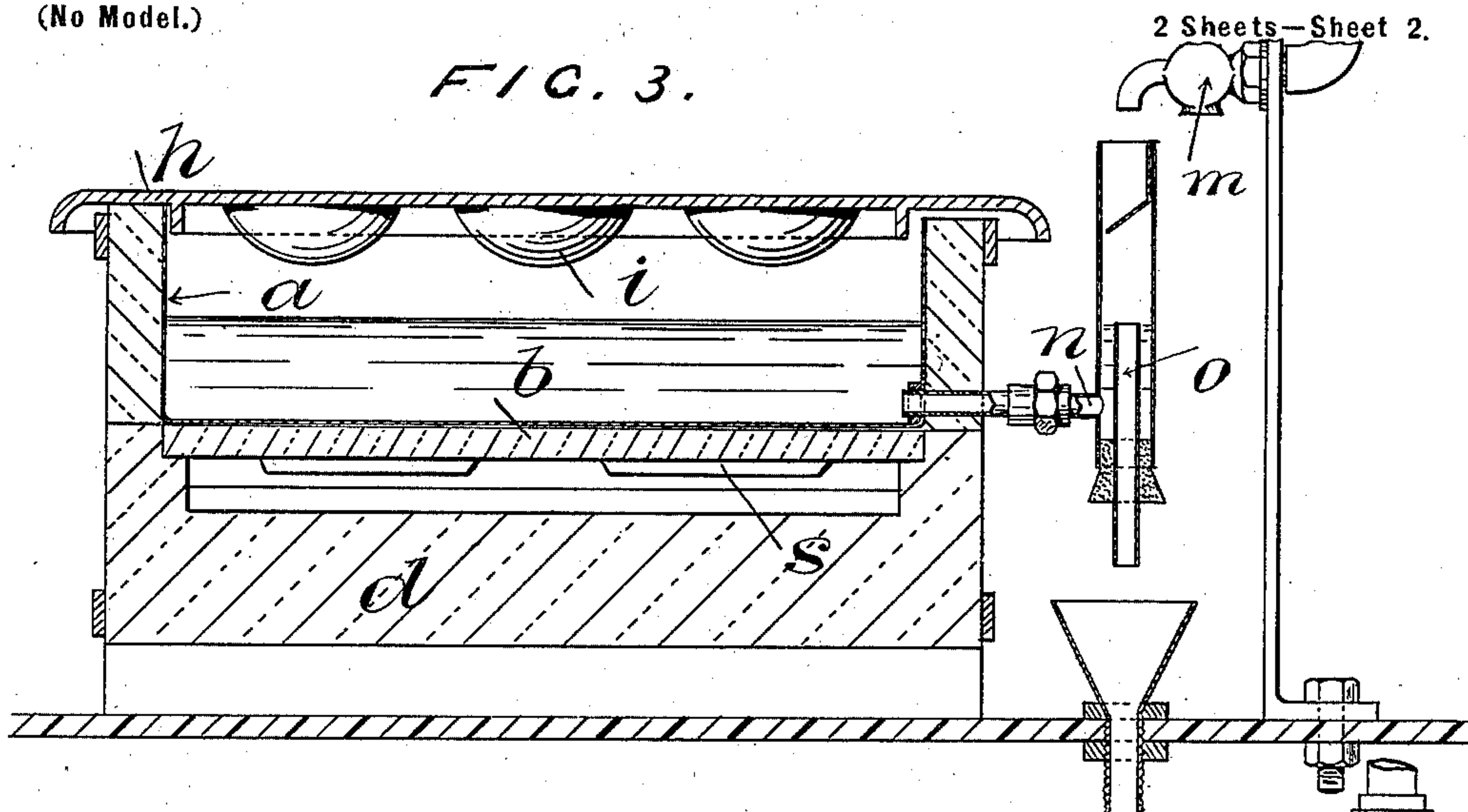
INVENTOR
David Laird
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FIG. 3.



2 Sheets—Sheet 2.

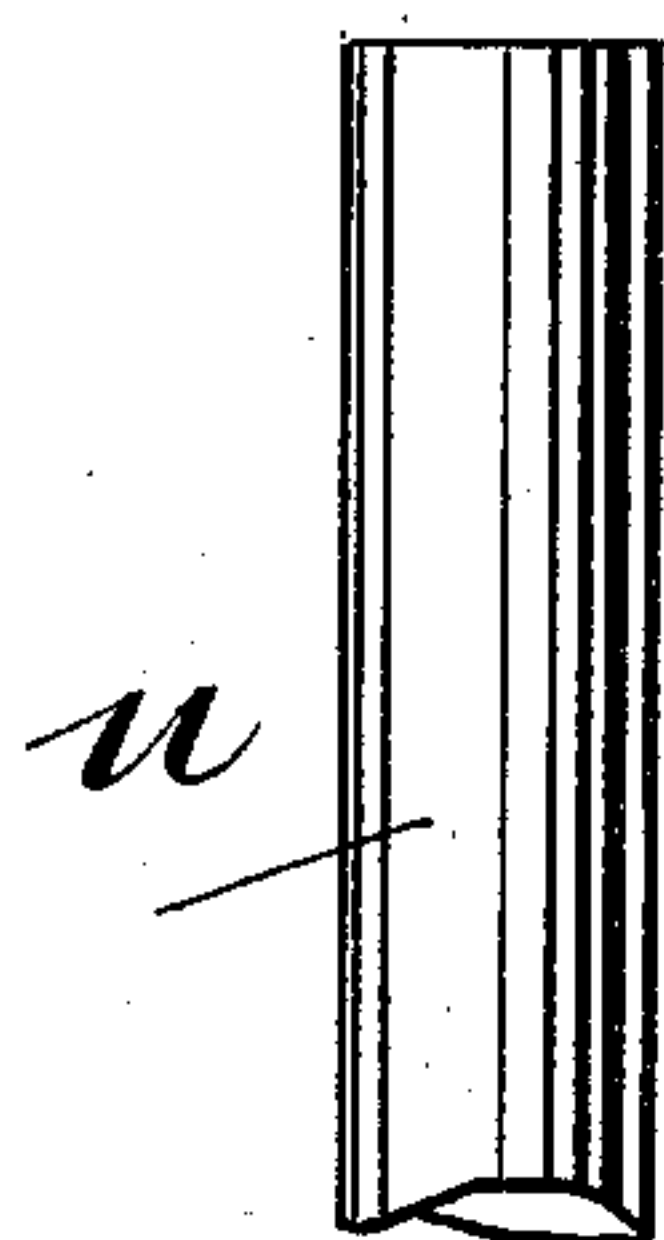
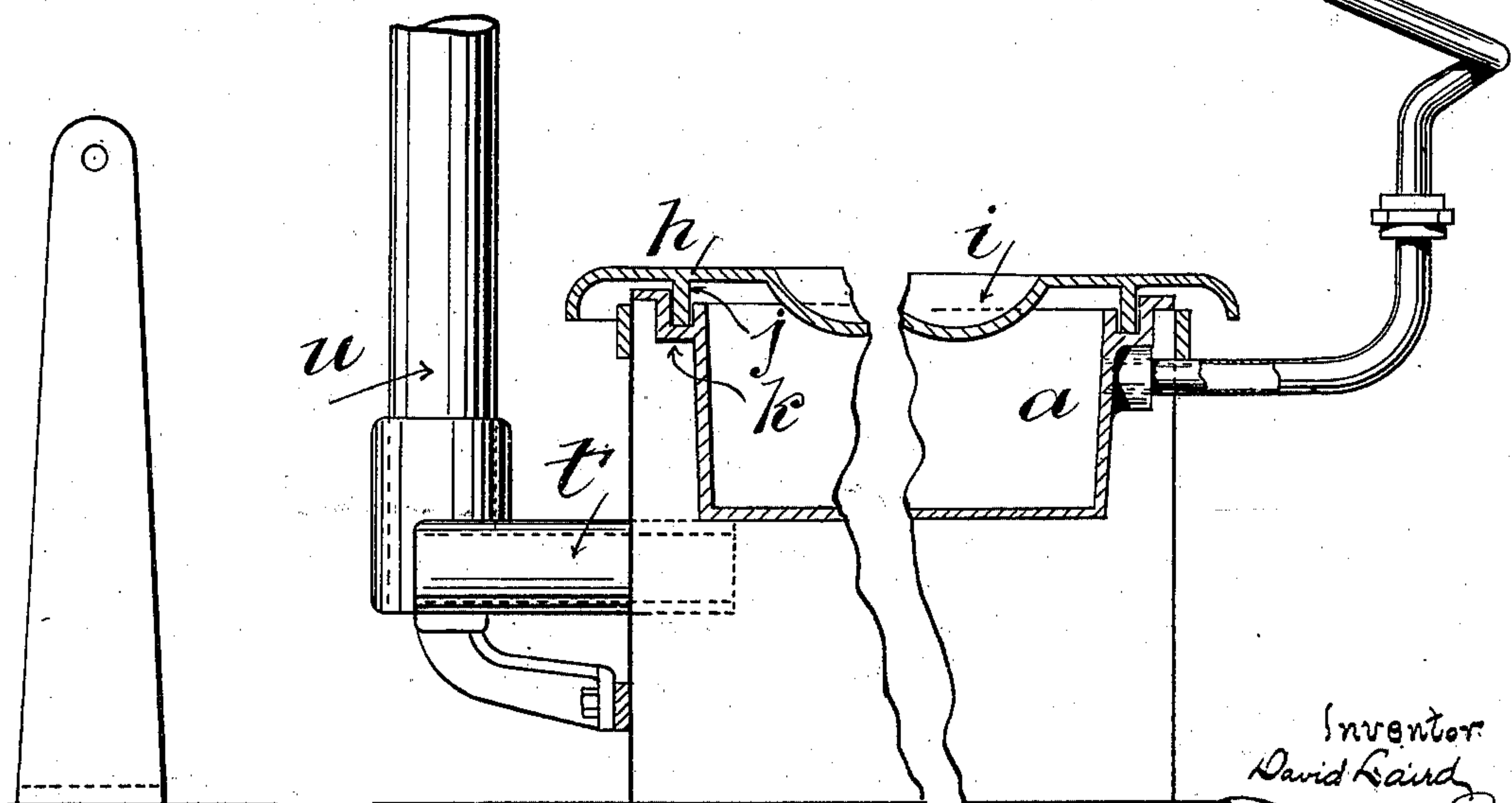
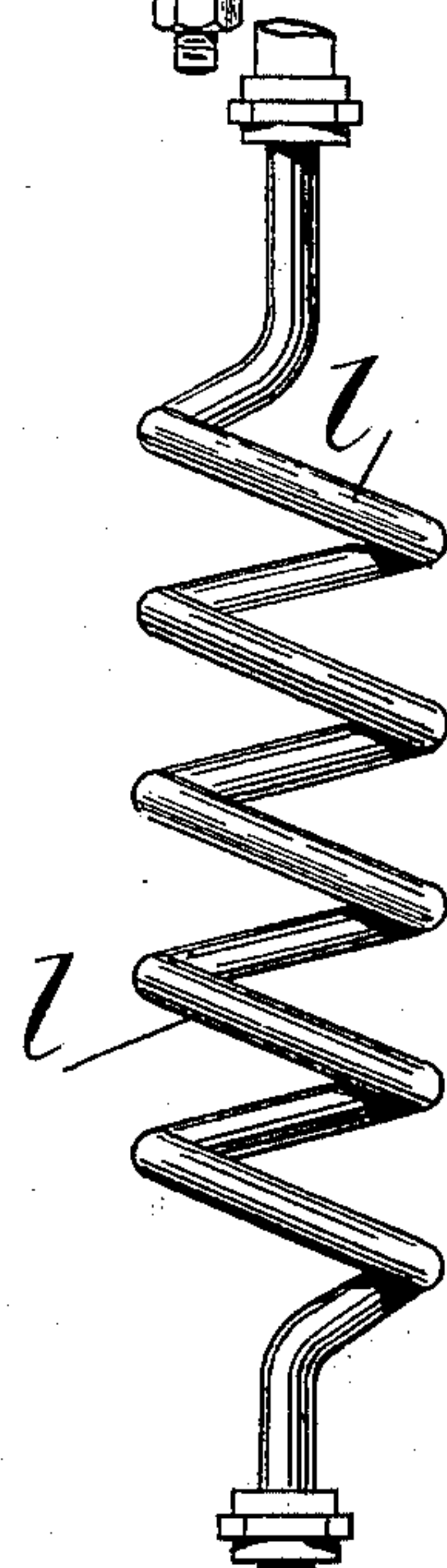


FIG. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID LAIRD, OF FORFAR, SCOTLAND.

LIQUID-HEATING FURNACE.

SPECIFICATION forming part of Letters Patent No. 691,866, dated January 28, 1902.

Application filed September 24, 1901. Serial No. 76,329. (No model.)

To all whom it may concern:

Be it known that I, DAVID LAIRD, engineer and metallurgist, a subject of the King of Great Britain and Ireland, and a resident of Forfar, in the county of Forfar, Scotland, have invented a certain new and useful Improved Furnace for Heating, Evaporating, or Concentrating Infusions, Solutions, and Liquids, of which the following is a specification.

10 This invention relates to a furnace for heating, evaporating, or concentrating infusions, solutions, and liquids generally, and relates particularly to the type of furnace in which a water-bath is employed.

15 In the accompanying two sheets of drawings, Figure 1 is a longitudinal section of the improved furnace. Fig. 2 is a plan. Fig. 3 is a cross-section. Fig. 4 is a detail view.

In an evaporating-furnace constructed in accordance with my invention I employ the usual or a suitable water bath or tank *a*. The water-bath *a* rests upon a slab *b*, of fire-clay or other refractory material, which forms a crown to an inclined furnace-flue or flame-bed *c*, constructed in the lower fire-clay portion *d*. The tank *a* is also surrounded by fire-clay slabs *e*, the whole being incased by an envelop *f*, of thin sheet-steel, and bound together by hoops *g*.

30 Resting on the top of the tank *a* and fire-clay casing *e* is a tray *h*, having a number of circular recesses *i* to receive the metallic or other saucers containing the solution, infusion, or liquid to be concentrated or evaporated. In Figs. 1 to 3 the tray *h* is provided with an internal ledge *j*, fitting closely inside the tank or water-bath *a* to assist in preventing the escape of steam. A modification of this arrangement is shown in Fig. 4, in which the ledge *j* sits within a gutter *k*, formed on the water-tank *a*. The gutter *k*, being filled with water, provides an efficient seal against the escape of steam from the tank. Steam from the tank *a* is condensed by the coil *l*,

the water of condensation returning to the tank. To maintain the water-level within the tank, a drip-cock *m* is provided, the feed-water passing through the pipe *n* to the tank *a*, the inner pipe *o* carrying off the excess water and maintaining a constant level within the water-tank *a*.

For heating the evaporating-furnace I employ a burner generating a flame of liquid hydrocarbon and air under pressure, or it might be hydrogen gas and air. The burner consists of a combustion-chamber *p*, an oil or liquid-hydrocarbon drip-pipe *q*, supplied with oil from any suitable source, and an air-blast pipe *r*, through which passes air under pressure from any suitable compressing or blowing device. Beneath the fire-clay crown *b* are a number of deflecting-ribs *s*, by means of which the flame and hot gases are deflected so as to bring them to bear over the entire area of the fire-clay crown *b* on their way to the flues *t t* and chimney *u*, as shown by the arrows in Fig. 1. The bottom of the flame-bed farthest from the burner is gradually inclined toward the crown *b*, so as to concentrate the hot gases as the heat thereof diminishes, and thus maintain the equality of temperature of the fire-clay crown *b* as much as possible through its entire area.

I declare that what I claim is—

In a furnace of the class described, the combination with the inclined bottom and walls, of a fire-clay crown above said bottom and encircled by said walls, a water bath or receptacle seated on said crown, a suitable cover for said receptacle, and an oil-burner discharging into the space between said bottom and crown, substantially as described.

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

DAVID LAIRD.

Witnesses:

JOSHUA ENTWISLE,
RICHARD IBBERSON.