

(No Model.)

2 Sheets—Sheet 1.

G. H. SMITH.

APPARATUS FOR THE MANUFACTURE OF WHITE LEAD.

No. 303,277.

Patented Aug. 12, 1884.

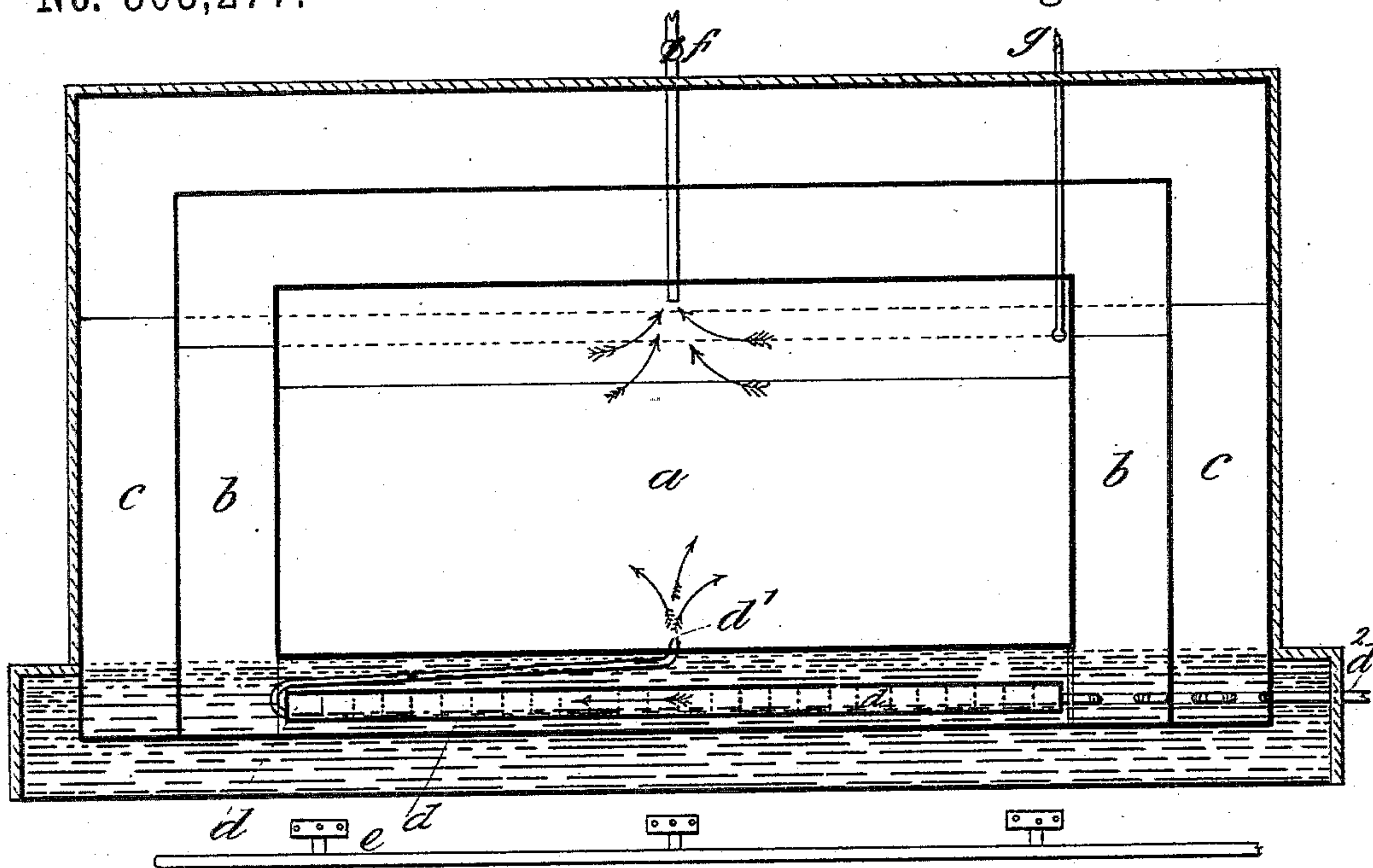


Fig. 1.

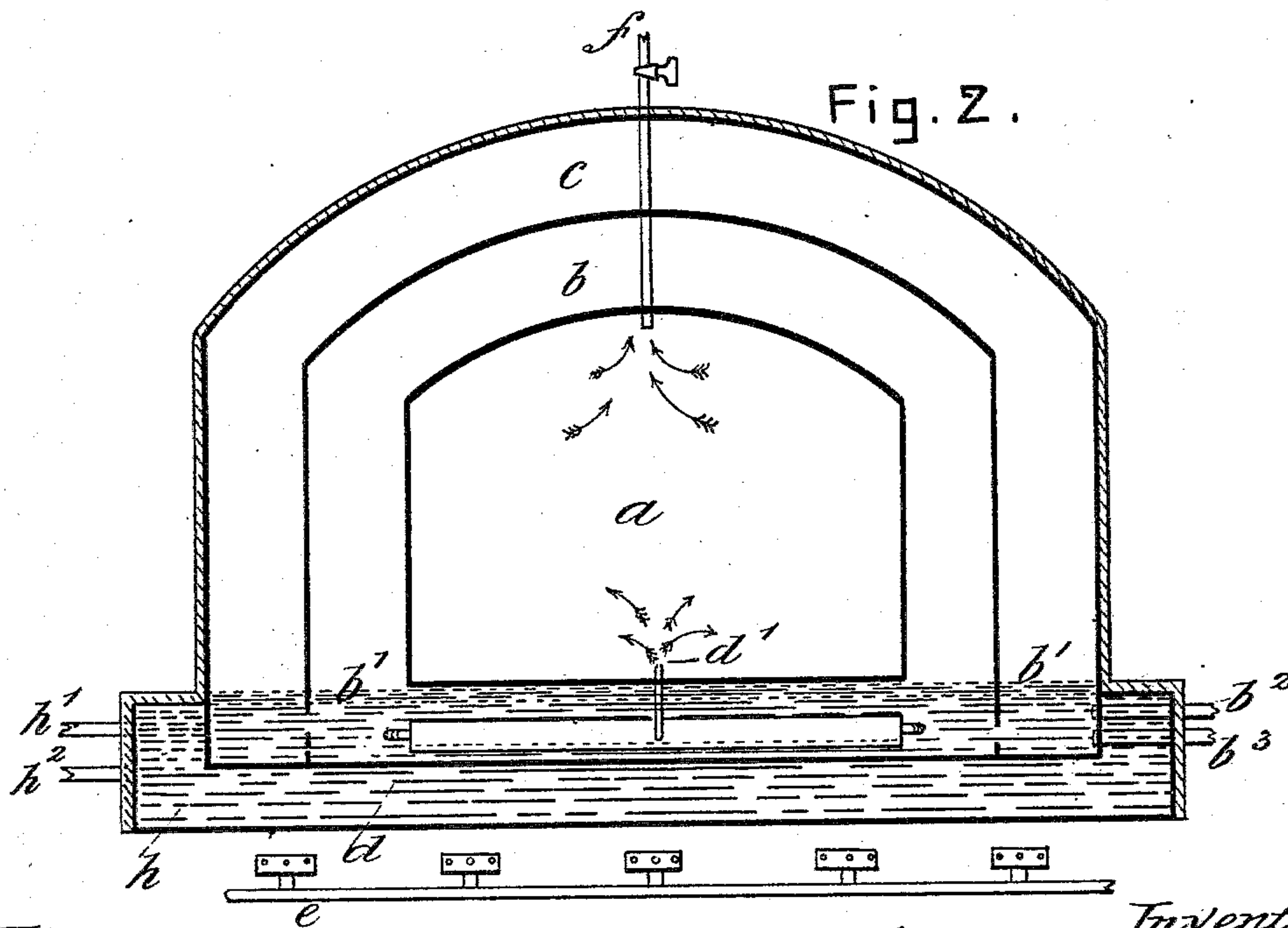


Fig. 2.

Attest:  
D. R. Lone  
E. H. Baker

Inventor:  
George Hand-Smith  
by John J. Halsted & Son,  
his Attys

(No Model.)

2 Sheets—Sheet 2.

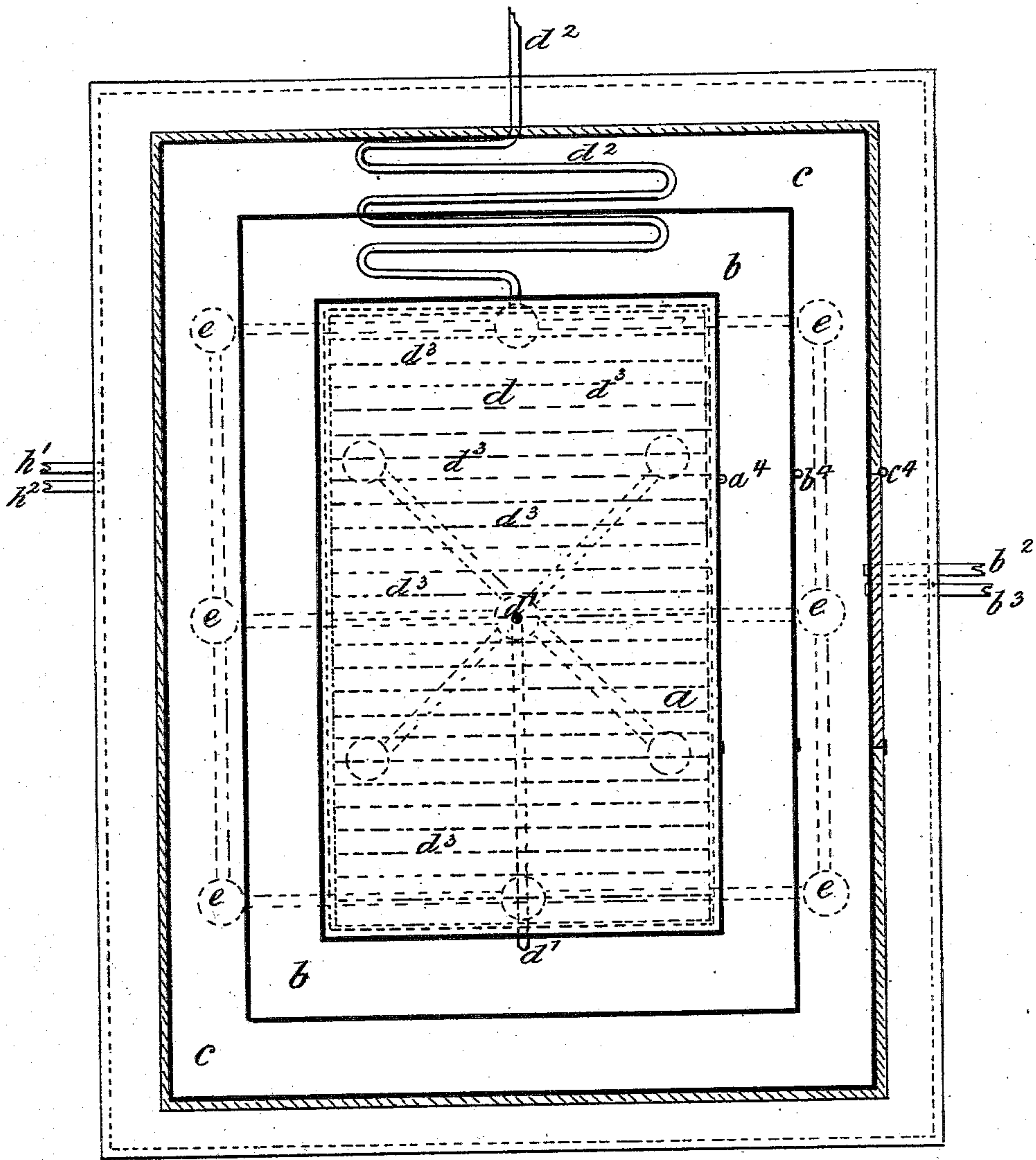
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APPARATUS FOR THE MANUFACTURE OF WHITE LEAD.

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Fig. 3.



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# UNITED STATES PATENT OFFICE.

GEORGE HAND SMITH, OF LONDON, COUNTY OF MIDDLESEX, ENGLAND.

## APPARATUS FOR THE MANUFACTURE OF WHITE LEAD.

SPECIFICATION forming part of Letters Patent No. 303,277, dated August 12, 1884.

Application filed October 4, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE HAND SMITH, of Rochester, Monroe county, in the State of New York, a citizen of the United States of America, temporarily residing at London, in the county of Middlesex, England, doctor of medicine, have invented a new and useful Apparatus for Use in the Manufacture of White Lead, of which the following is a specification.

My invention relates to improved apparatus for use in the manufacture of white lead, by which a more efficient control of the constituent elements may be attained to secure their more efficient treatment and more effectual combination, so as to obtain more rapid and economical production of white lead of good marketable quality, like in character to the white lead of the Dutch or Anglo-Dutch process. The blue or metallic lead, in operation with this apparatus, is subjected to the corrosive action of a mixture of air and carbonic-acid gas, in suitable relative proportions, heated and charged with aqueous vapor and acetic acid within a closed receptacle, the metallic lead in the chamber being perforated or in sheets or disintegrated, or otherwise so reduced as to give the most favorable exposure to corrosive action.

Figure 1 shows a longitudinal section of the apparatus. Fig. 2 is a transverse section of the same, and Fig. 3 is a sectional plan view thereof.

$a$  indicates the chamber where the lead in a metallic state is placed to be operated upon by corrosion to form the white lead of commerce, and this chamber  $a$  is accessible by openings or doors at  $a'$   $b'$   $c'$  in the walls of that chamber, and of the surrounding heat-retaining air-cells  $b$   $c$ .

$d$  is a saturator supplying air saturated with moisture to the chamber  $a$  by a pipe,  $d'$ , which pipe has a contracted orifice within the chamber  $a$ . This saturator  $d$  is provided with a series of porous diaphragms, (shown by dotted lines  $d''$  at intervals therein,) which hold suspended a mixture of water and acetic acid placed therein, and giving off the same to air traversing that saturator  $d$  in its course to the chamber  $a$ , under pressure, and this air is

heated prior to its entering the saturator  $d$ , by its traversing the serpentine pipe  $d''$  in its passage from a suitable source of air and carbonic-acid-gas supply under pressure, such as a pump, bellows, or gasometer-chamber. The chamber  $a$  is supported above the level of a tray or channel for liquid, formed by the lower parts of the heat-retaining cells  $b$   $c$  at  $b'$ , through-out which the contained liquid may circulate, and within this liquid the saturator  $d$  is placed for the purpose of being heated. Beneath this tray  $b'$  is formed the water-bath  $h$ , for conveying equally to the whole apparatus the heat supplied by the gas-burners  $e$ .

$h'$  is a supply-pipe, and  $h''$  a draw-off to the bath  $h$ , and  $b''$   $b'''$  are like pipes to the inner liquid-receptacles,  $b'$ .

$f$  is a pipe for the escape of surplus atmosphere from the lead-chamber  $a$ .

$g$  is a thermometer, for indicating the temperature of that chamber, and a like indicator is applied to the water-bath  $h$ , but is not shown. Valves, regulators, and indicators are also applied to the gas-supply pipes to the burners  $e$  in manner well understood, and not necessary to show in the drawings. The curved roofs to the chamber  $a$  and heat-retaining cells  $b$  and  $c$  serve to carry down any moisture which might condense thereon, and prevent dripping of moisture onto the lead or collection thereof on those roofs. The arrows show the direction of flow of the air through the saturator and heater to the lead-chamber  $a$ .

The operation as carried on with this apparatus is as follows: The prepared metallic lead is, as already mentioned, placed in the chamber  $a$ , closed, and this chamber is heated to about 120° to 140° Fahrenheit, and then the cock controlling the pipe  $d'$  is turned, permitting the inflow of the corroding moisture-laden air, and this air, under pressure, on entering the chamber  $a$  expands and reduces the temperature, while the gaseous air is most effectually saturated with moisture in the presence of the lead, and a most efficient chemical action is set up resulting in an increased production of white lead.

The carbonic-acid gas may be generated by any of the well-known modes in use, and supplied to the pipe  $d''$ .



I claim—

In apparatus for use in the manufacture of white lead, the combination of the corroding-chamber *a*, heat-retaining cells *b* and *c*, saturator *d*, with its delivery and heating pipes *d'* *d''*, water bath, and heating means, substantially as and for the purpose specified, and shown in the drawings.

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE HAND SMITH.

Witnesses:

FRED DONNISON,  
JOHN ALFRED DONNISON.