

(No Model.)

J. MAKIN.

LEAD LINED BOILER FOR PAPER PULP.

No. 344,120.

Patented June 22, 1886.

Fig. 1.

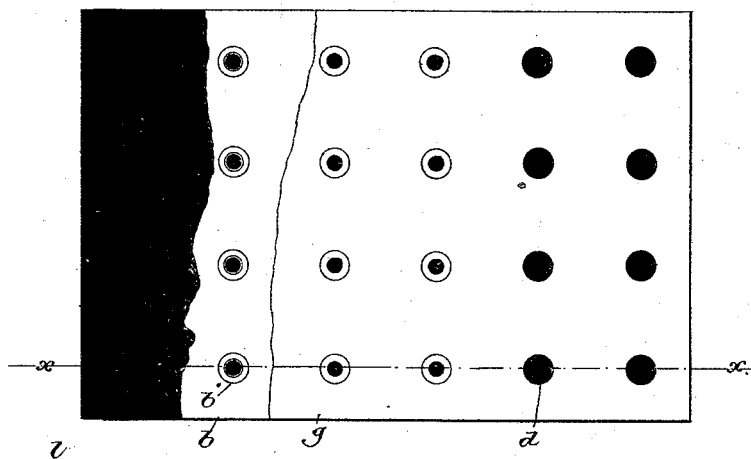
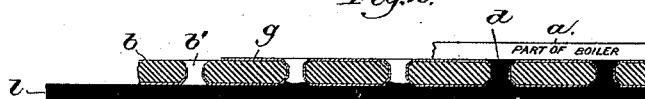


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN MAKIN, OF BELFIELD; NEAR ROCHDALE, COUNTY OF LANCASTER, ENGLAND, ASSIGNOR TO CHARLES C. SPRINGER, TRUSTEE, OF YARMOUTH, MAINE.

LEAD-LINED BOILER FOR PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 344,120, dated June 22, 1886.

Application filed April 27, 1886. Serial No. 200,312. (No model.)

To all whom it may concern:

Be it known that I, JOHN MAKIN, of Belfield, near Rochdale, in the county of Lancaster, England, manager of a paper-works, have
5 invented an Improvement in Lead-Lined Boilers for Paper-Pulp, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 In the manufacture of paper-pulp from wood by the so-called "sulphite process" it is necessary to provide the boiler with a lining, coated or covered at its inner side with lead or other usual acid-resisting metal.

15 Patent of the United States No. 335,943, dated February 9, 1886, shows and describes a compound lining consisting of a foundation-plate, preferably of iron, covered on both sides with lead, the lead being caused to adhere to
20 the foundation-plate by casting.

In practice it has been found that sheet-lead forms the most serviceable face; but great difficulty has been experienced in securing the sheet-lead to the foundation-plate.

25 In my experiments to employ sheet-lead I have discovered that the same may be firmly secured or anchored to the foundation-plate by means of solder dropped into the holes made in the plate, the said solder attaching itself to
30 the lead opposite the said holes, the said lead being partially melted opposite the holes before the introduction of the solder.

My invention therefore consists in a novel method of attaching sheet-lead to a foundation-plate in the manufacture of a compound
35 lining for pulp-forming boilers.

My invention consists, essentially, in placing the foundation-plate and sheet-lead in contact, then partially fusing the lead opposite
40 the holes in the foundation-plate, and running molten solder into the said holes to unite them with the partially-fused portion of the sheet-lead, the said solder filling the said holes and attaching itself firmly to the sheet-lead, constituting a series of bolts or anchors to hold
45 the sheet-lead in place on the foundation-plate and prevent it from creeping. The term "creeping" is fully explained in said patent.

Figure 1 represents a piece of lead lining

suitable to be applied to a boiler, shell, or tank
50 for the production of wood or other fibrous pulp by a process wherein acid is employed; and Fig. 2 is a section of Fig. 1 in the dotted line *x x*, the said figure also showing a small portion of the boiler.

55 The boiler or other vessel *a*, a portion of which is shown in Fig. 2, is or may be of any usual shape commonly employed in the manufacture of wood pulp.

The compound lining is composed, essentially, of a foundation-plate, *b*, having a series of holes, *b'*, and preferably the entire surface of the foundation-plate will be covered with tin or zinc by a dipping or galvanizing process, in order that the lead or solder brought
60 65 in contact therewith may more readily adhere thereto.

In the drawings I have represented the tinning or galvanizing by the letter *g*; but the thickness of the tinning or galvanizing is exaggerated.

The sheet-lead, *l*, to be used will in practice be about three-eighths of an inch thick, more or less. The foundation-plate, preferably
70 75 tinned or galvanized, will be laid upon the sheet-lead *l*.

As herein shown, it is supposed that the compound lining is to have a straight side; but the compound lining may be made to present any curve by first bending the foundation-plate
80 to the proper curve and by employing a template of the proper curve, upon which the sheet-lead will be laid, the curved foundation-plate being thereafter laid upon the sheet-lead.

Assuming that the foundation-plate and
85 sheet-lead have been placed in contact, the operator by means of a blow-pipe will blow the flame into the holes *b'* and partially melt that part of the sheet-lead opposite the lower end of the holes, and while the same is yet in
90 molten state will fill the said hole with molten solder, which will combine with the molten lead, constituting, as it were, a solder rivet integral with the lead lining.

Sheet-lead *l*, anchored, as described, at frequent intervals by means of solder, bolts, or
95 rivets *d*, will be found to be so firmly attached to the foundation-plate that the lead will not

creep on or detach itself from the foundation-plate.

Herein I have not considered it necessary to show the entire pulp-boiler; but the same may
5 and preferably will be spherical, or of the shape represented in the said Makin patent.

The edges of the compound lining will be united together in any usual manner—as, for instance, in the said patent or in United States
10 Patent No. 335,046.

By the term “solder” I mean any usual fusible solder mixture.

I claim—

An improvement in the art or method of
15 manufacturing compound linings for boilers, which consists in placing the sheet-lead and

perforated foundation-plate together, partially fusing the lead opposite the holes in the foundation-plate, and filling in the said holes with
solder, the solder attaching itself to the sheet- 20 lead and holding the same in place upon the foundation-plate, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN MAKIN.

Witnesses:

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