(No Model.)

C. C. SPRINGER.

PULP DIGESTER.

No. 411,838. Patented Oct. 1, 1889.

Fig. 1.

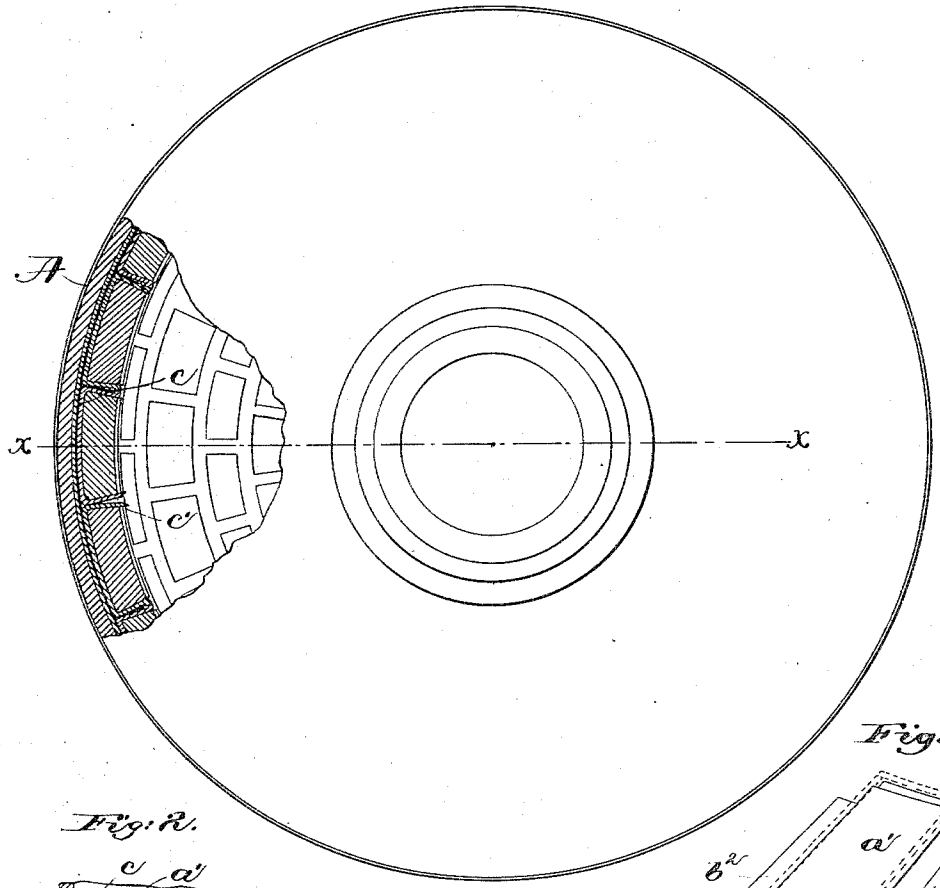


Fig. 2.

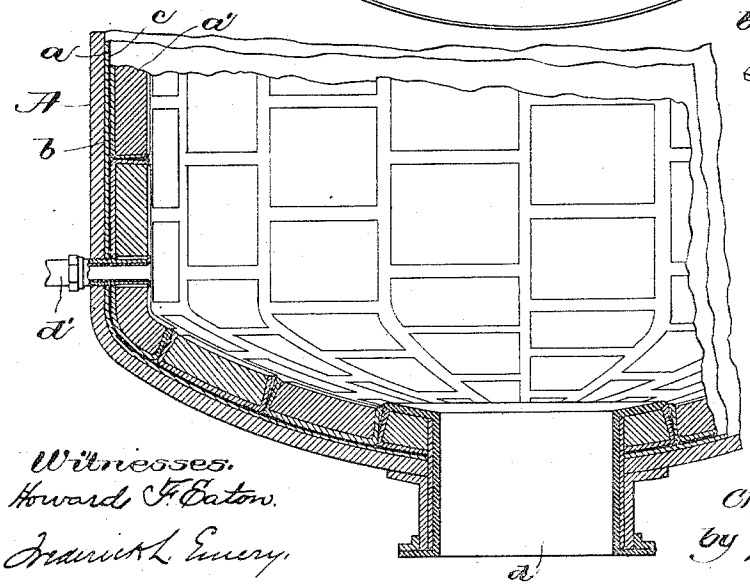
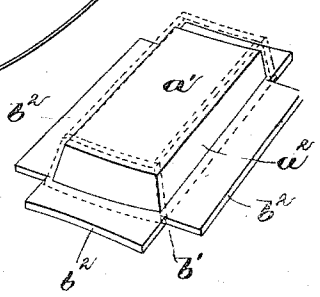


Fig. 3.



Witnesses.
Howard F. Eaton.
Frank L. Emery.

Inventor
Charles C. Springer,
by Crosby & Gregory Attys.

UNITED STATES PATENT OFFICE.

CHARLES C. SPRINGER, OF BOSTON, MASSACHUSETTS.

PULP-DIGESTER.

SPECIFICATION forming part of Letters Patent No. 411,838, dated October 1, 1889.

Application filed January 7, 1888. Serial No. 295,650. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. SPRINGER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Pulp-Digesters, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to boilers or digesters employed in the manufacture of pulp from wood and other fiber, and is an improvement upon boilers of that class in which the acid-resisting lining is composed, essentially, of porcelain or other acid-resisting tile.

My invention has for its object to provide an efficient, simple, and cheap lining; and it consists, essentially, in the combination, with the boiler-shell, of an acid-resisting lining therefor consisting of blocks or tiles, and a backing or covering for each tile composed of lead or acid-resisting metal, having side flaps, the flaps of the coverings of adjacent tiles being sealed together to effect a liquid-tight joint and maintain the lining of tiles intact, substantially as will be described.

Figure 1 is a top or plan view of a boiler or digester partially broken out provided with an acid-resisting lining embodying my invention, Fig. 2 a vertical section of a sufficient portion of a boiler to enable my invention to be understood, and Fig. 3, a detail in perspective, to be referred to.

The boiler-shell A, which may be made of steel or iron or other usual metal, is first preferably covered and protected on its inner side with a layer *a* of sheet-lead or other acid-resisting metal or composition of metals. The shell A is further protected from the injurious action of the bisulphite or other chemical solution usually employed by an acid-resisting lining consisting, essentially, of blocks or tiles *a'* of porcelain or other silicious or acid-resisting material. Each block or tile *a'* is preferably made with beveled sides, as at a^2, (see Fig. 3,) and in accordance with my invention each tile is provided with a covering or backing *b*, composed of sheet-lead or other acid-resisting metal, the said covering or backing being made larger than the tile, and having its corners cut away, as at *b'*, Fig. 3, to leave side flaps b^2, which are folded or turned up against the sides of the tile. Between the backing or covering *b* and the layer *a* is preferably interposed a layer *c* of asbestus or other yielding and preferably acid-resisting material, forming a cushion for the tile.

In practice each block or tile will be covered with its backing *b* before it is placed in the boiler, and the side flaps may be turned up and united by burning, as by a blow-pipe, so that when the tile is placed within the boiler the ends of the said flaps will project beyond the face of the tile, as shown at *c'*, Fig. 1. The projecting ends of the side flaps will then be turned, tamped, or hammered down into the space between adjacent tiles to completely fill the space and effect a liquid-tight joint or seal, and, if desired, the said lead flaps may be burned with a blow-pipe or in any other usual manner, the tamping or sealing of the lead flaps, together with the shape of the tile, which is preferably arched to conform to the shape of the boiler, serving to secure the acid-resisting lining of tile in place.

My improved lining dispenses with the use of bolts, which are liable to crack and break the tile. Furthermore, the cost of lining boilers or digesters is largely diminished.

The boiler will be provided with the usual man-holes *d* at its opposite ends, through which the sulphite liquor is introduced, and will be provided with steam-inlet pipes *d'*, only one of which is shown, the said pipe being made of phosphor-bronze or other usual acid-resisting material.

I claim—

1. In a boiler or digester for the manufacturing of pulp, the combination, with the boiler-shell, of an acid-resisting lining therefor consisting of blocks or tiles, and a backing or covering for each tile composed of lead or acid-resisting metal having side flaps, the flaps of the coverings of adjacent tiles being sealed together to effect a liquid-tight joint and maintain the lining of tiles intact within the boiler, substantially as described.

2. In a boiler or digester for the manufacturing of pulp, the combination, with the boiler-shell, and a layer of sheet-lead next to the boiler-shell, of an acid-resisting lining

therefor consisting of blocks or tiles, and a backing or covering for each tile composed of lead or acid-resisting metal having side flaps, the flaps of the coverings of adjacent tiles being sealed together to effect a liquid-tight joint and maintain the lining of tiles intact within the boiler, substantially as described.

3. In a boiler or digester for the manufacturing of pulp, the combination, with the boiler-shell and a layer of sheet-lead next to the boiler-shell, of an acid-resisting lining consisting of blocks or tiles, and a backing or covering for each tile composed of sheet-lead having side flaps, and a cushion of asbestus or yielding acid-resisting material interposed between the backings or coverings and the layer of lead, the flaps of the coverings of the adjacent tiles being sealed together to effect a liquid-tight joint and maintain the lining of tiles intact within the boiler, substantially as described.

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

CHARLES C. SPRINGER.

Witnesses:
JAS. H. CHURCHILL,
FREDERICK L. EMERY.