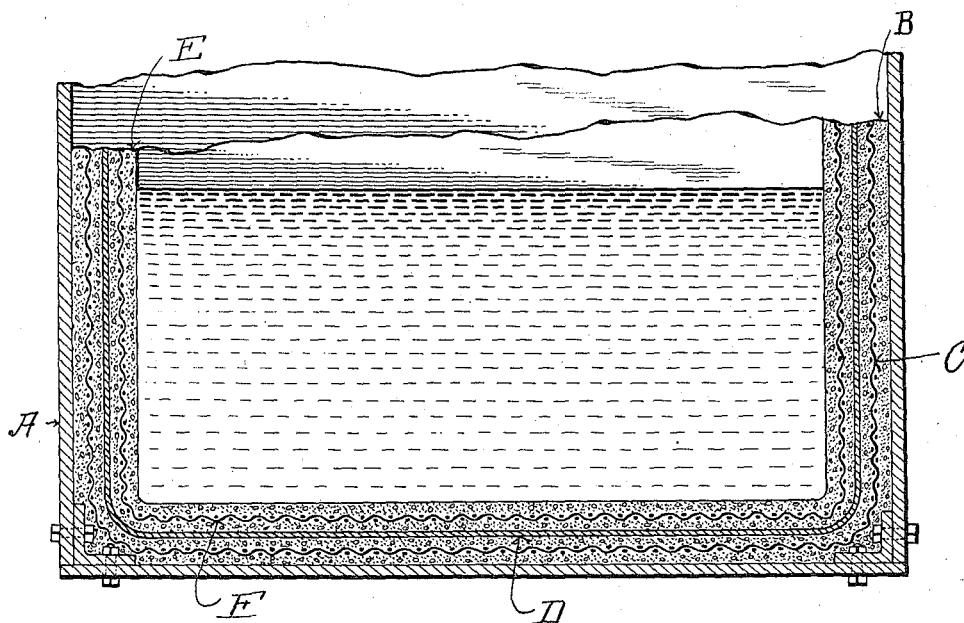


T. E. MURRAY,
LINING FOR TANKS,
APPLICATION FILED MAR. 13, 1915.

1,156,425.

Patented Oct. 12, 1915.



Witnesses:
George T. Porter.
May T. Murray

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UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF NEW YORK, N. Y.

LINING FOR TANKS.

1,156,425.

Specification of Letters Patent. Patented Oct. 12, 1915.

Application filed March 13, 1915. Serial No. 14,065.

To all whom it may concern:

Be it known that I, THOMAS E. MURRAY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Linings for Tanks, of which the following is a specification.

In U. S. Patent No. 1,073,621, granted to me September 23, 1913, there is described a tank to contain the liquid upon which the solid particles held in suspension in the hot gas current are projected. This tank is located at the bottom of the stack and is made with walls of steel or iron plate. The liquid is usually water, which becomes strongly charged with acid when the current comes from boiler furnaces, and also contains the hard particles of solid matter which are discharged into it. The acid liquor soon chemically attacks the metal of the tank, and in addition said metal is also abraded by the solid particles, so that deterioration follows. My present invention is a lining for tanks subjected to such chemical and abrasive action, by means of which said deterioration is prevented.

The accompanying drawing is a vertical section of a tank provided with my said lining.

A is the tank having walls of steel or other heat resisting metal. Within said tank I first place a lining B of concrete, preferably reinforced by wire or metal strips C. Upon the lining B, I place a lining D of sheet lead, and finally the lining D is in turn lined with a concrete layer E, preferably reinforced with metal wires or strips F, as already described.

The concrete lining B provides a smooth bed for the lead lining D, of material which is itself acid-proof. But a concrete lining only—such as B—is not liquid tight, and hence the liquid would filter through it and so reach the steel wall of the tank. The lead lining D forms an impervious layer which is

also acid-proof, and therefore prevents this infiltration through lining B. To place the lead lining directly upon the tank wall would be objectionable because of the difficulty of fitting it upon the bolts, angle-irons and other projections within the tank. All of these become embedded in the concrete lining B, so that a smooth surface can easily be made on said lining to receive the lead lining D. If, however, the lead lining D is left without any protection, so that the hot boiler gases come in contact with that portion of the lining which extends above the water-line and with the portion normally under the water-line when the water for any reason is withdrawn, the lead bulges under the heat and being non-elastic does not return to its original position. Following the distortion, small cracks develop which permit the liquid to get under the lead, increasing the bulging and besides filtering down through the concrete lining B, as already described. To prevent this, the third or innermost lining E of concrete is provided, which protects the lead, holds it firmly in place, prevents its distortion and resists the action of acid and abrasion.

I claim:

1. An impervious acid-proof lining for metal tanks, comprising two layers of concrete, and an interposed layer of sheet metal non-attackable by said acid.
2. An impervious acid-proof lining for metal tanks, comprising two layers of cement, and an interposed layer of sheet lead.
3. An impervious acid-proof lining for metal tanks, comprising two layers of reinforced concrete, and an interposed layer of sheet lead.

In testimony whereof I have affixed my signature in presence of two witnesses.

THOMAS E. MURRAY.

Witnesses:

GERTRUDE P. PORTER,
MAY T. McGARRY.