

## UNITED STATES PATENT OFFICE.

ROMEDIUS PANZL, OF MUSKEGON, MICHIGAN.

## COMPOSITION FOR ACID-PROOF LINING OF DIGESTERS.

SPECIFICATION forming part of Letters Patent No. 744,689, dated November 17, 1903.

Original application filed August 6, 1902, Serial No. 118,667. Divided and this application filed May 4, 1903. Serial No. 155,659. (No specimens.)

*To all whom it may concern:*

Be it known that I, ROMEDIUS PANZL, of Muskegon, county of Muskegon, and State of Michigan, have invented certain new and useful improvements in compositions for acid-proof linings of digesters and of other vessels and conduits used for storing, boiling, or conveying of corrosive liquids, of which the following is a specification.

The following is a full, clear, and exact specification of my invention, which consists of the hereinafter-described composition of matter to be used in constructing linings for the interior of such vessels and conduits.

This invention relates more particularly to pulp-digesters, which are vessels used for preparing pulp for paper-making. In these vessels the pulp is subjected to the action of corrosive liquids, which would rapidly destroy the iron shell of such digesters. It is therefore necessary to provide the interior of such digesters with lining that is impervious to and not affected by such corrosive liquids. The digesting process requires also a high degree of heat and high pressure in the interior of the digester. The heat acting upon the metallic shell of the digester causes it to expand and to avoid cracking of the lining. Such lining material should also be to some extent yielding and expansible. Such material is set forth in my application for Letters Patent, filed August 6, 1902, Serial No. 118,667, of which this application is a subdivision. It is composed of calcined chamotte, slag, burnt cement, and coal-tar pulverized and mixed and then made into a plastic mass by adding thereto liquid silicate of soda. To protect such lining against abrasion, a superlining of tiles is made thereon of acid-proof tiles, as set forth in my aforesaid application for a patent. For affixing the tiles upon the lining and joining the tiles together and upon each other I use a mortar composed of the following ingredients, the parts being measured by volume: seven parts of pulverized chamotte or crushed chamotte bricks and three parts of burnt cement, to which after being thoroughly mixed such quantity

of silicate of soda of from 30° to 45° Baumé is added as is required to produce a plastic mass of such consistency as ordinary mortar used in plastering. The dry ingredients of the mortar may be mixed together in larger quantities; but the mixing thereof with the liquid silicate of soda must be done only in small quantities for immediate use, because the mortar hardens quite rapidly. This mortar possesses the quality of combining with the acid-proof tiles and with the expansible lining material of which the first layer of the lining is constructed and is absolutely impervious to and not affected by any corrosive liquids.

When constructing the superlining of tiles, the mortar is applied on the back and all adjoining surfaces of the tiles. The tiles are pressed hard in their places and care must be taken that any air-bubbles that may be caught between the tiles and the surfaces to which they are to be applied are expelled. It is preferable and advantageous to apply the first course of tiles before the layer of expansible lining material is hardened. This produces a better union of the mortar with the layer to be protected by the tiles. Therefore in practical application of my invention the lining of the digester is proceeded with in such manner that immediately after applying the layer of the expansible lining material upon the shell the tiles are applied thereon, the work of lining of the digesters being proceeded with from the bottom outlet thereof successively toward the top. When more than one layer of such tiles is applied, the second and successive layers of such tiles are applied upon the preceding layers as the lining progresses from bottom toward the top of the digester. This, however, is not absolutely necessary, and the second and successive layers of the tiles may also be applied after the first layer of tiles is completed or each successive layer after the completion of the preceding one.

The manner of applying the composition of matter set forth therein and using it in combination with other constituent parts of a digester-lining is more fully set forth and

claimed in my application for Letters Patent,  
filed August 6, 1902, Serial No. 118,667, of  
which this application is a subdivision.

Here I claim as my invention—

- 5 1. An acid-proof mortar composed of cham-  
otte, burnt cement and silicate of soda.  
2. An acid-proof mortar composed of seven

parts of chamotte, three parts of cement, and  
of liquid silicate of soda.

ROMEDIUS PANZL.

Witnesses:

W. S. HORN,  
PAUL E. MEESKE.