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CONCRETE PILE AND SIMILAR STRUCTURE

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This invention pertains to an improved method of manufacturing water-proofed concrete structures and more particularly concrete piles.

The invention refers more particularly to such a structure which is coated, impregnated or saturated with an asphaltic like substance.

I am aware of the fact that attempts have been made at various times to saturate or paint such structure with an asphaltic compound, or in some cases to impregnate it by immersing the whole structure in heated and liquefied asphalt. This, I find, however, to be a wrong method of procedure, for, as a structure of this type is immersed into a hot liquid asphalt or saturating compound, all the superficial pores are immediately closed, while, on account of the heat, moisture inherently present in the material is transformed into steam and an internal pressure is created in the structure which prevents further saturation and, in fact, often will cause disrupture of the structure itself.

In my process, the concrete structure, plain or reinforced and of any form or shape, after first being cured in the ordinary way, is first partially submerged in the liquefied asphalt; and, by being only partially submerged, all the avenues for the escape of the steam, gases, etc. are not closed but are left open at the unsubmerged portion of the structure; thus obviating the internal pressure and the obstruction to proper saturation. By slow and gradual submersion of the object into the heated asphalt, not only are the avenues of escape left open, but the structure at a point immediately above submersion is gradually heated and dried and put into a condition particularly suitable for the reception and retention of the asphalt. Thus is not only the structure water-proofed and rendered stronger but the reinforcements are protected by a coating of asphalt and being surrounded by an asphalt impregnated structure, the reinforcement is protected against any possible infiltration of corrosive liquids.

In order to produce my structure, I proceed as follows:

While describing the process in connection with the manufacture of a pile, it is to be understood that the same process can, obviously, be used for any structure of hydraulic cement which it is desired to have impregnated with bitumen or other water-proofing material.

I first form my pile in the ordinary way by mixing the aggregate of stone, sand, Portland cement, and water in suitable proportions, and casting it into the required shape or form with the reinforcements therein if the same are to be employed. I then allow the cement to "set" or become crystallized until the structure has acquired the necessary strength. After it has acquired its strength, the pile is then gradually, either in a vertical or horizontal position, partially submerged in a vat or tank. If a vertical tank is employed the end of a pile is first inserted or allowed to sink into the hot asphalt a short distance until all foaming, which indicates the removal of the water, has ceased. The steam and water, having avenues of escape through the pores, crevices, etc. of the structure immediately above the level of the asphalt, do not obstruct the saturation by causing pressure. As soon as the submerged portion has become saturated, the structure is lowered so as to immerse another section thereof, and so on successively as described until the whole pile is saturated.

If the process is to be proceeded with the pile in a horizontal position, then the pile is suitably supported and the asphalt is allowed to rise until successive portions of the pile are saturated exactly in the same manner as just described.

So too with the employment of a vertical tank the water-proofing material could be allowed to rise step by step around the pile instead of lowering the pile step by step into the tank and the water-proofing liquid contained therein. In other words there is a relative movement of the pile or structure with reference to the liquid.

In each and every case there is a slow and gradual submergence of the structure in the asphalt or a slow and gradual rise of the

liquid with reference to the structure always having in view the object of leaving avenues of escape for the expulsion of the gases and water.

What is claimed is:

1. The method of producing waterproofed concrete structures which comprises molding a wet aggregate; allowing the molded structure to set; causing by successive steps slow relative movement between the molded structure having moisture inherently present therein and a body of liquid waterproofing material having a temperature sufficient to expel moisture from the structure, the interval between the steps being sufficient to permit the removal of the moisture, thereby to gradually heat and dry the structure in advance of the line of submergence of the structure in the liquid.

2. The method of producing waterproofed concrete structures which comprises molding a wet aggregate; allowing the molded structure to set; causing by successive steps slow relative movement between the molded structure having moisture inherently present therein and a body of liquid waterproofing material having a temperature sufficient to expel moisture from the structure; gradually increasing the extent of immersion, the interval between the steps being sufficient to permit the removal of the moisture, thereby to gradually heat and dry the structure to permit steam formed therein to escape above the line of submergence of the structure in the liquid.

In testimony whereof I have signed my name to this specification.

AUGUST E. SCHUTTE.