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PROCESS OF MAKING CONCRETE

No Drawing.

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This invention relates to concrete ducts which are used for protecting lead cable sheath, and to the process of making the same.

The object of this invention is to provide a cable duct in which the corrosive effect of lime on the lead cable sheath is prevented or retarded.

Applicant discovered that certain substances tend to protect lead or lead alloy cable sheath from corrosive attack and that this effect is due to the presence of the silicate ion, that it is induced by so low a concentration as is afforded by a saturated calcium silicate solution and that it is effective within a relatively wide range of hydrogen ion concentration. Applicant further discovered that the corrosion of the lead cable sheath resulted in the formation of red crystalline lead monoxide which crystallizes from saturated solutions of lime or alkali plumbites or plumbates. The alkali responsible for corrosion may be produced by a solution of lime or alkali salt, sodium chloride or ordinary table salt which is used to thaw out street car switches in winter and occasionally finds its way into cable ducts where it is converted into caustic soda at the surface of the cable sheath as a result of current flow from the earth to the sheath. This type of corrosion also occurs in newly manufactured concrete ducts owing to the presence of free lime in the concrete. Applicant further discovered that distilled water exposed to the air readily corrodes cable sheath alloys and that this corrosive action may be prevented by the introduction of solid silicate or by the addition of finely divided silica flour.

According to this invention concrete cable ducts are constructed by introducing a certain quantity of soluble silicate as water glass silica or silicious slag in the concrete mixture while constructing the cable duct. The silicate has the property of neutralizing and considerably retarding or preventing the corrosive lime effect on the cable sheath through the formation of a silicate film on the surface of the cable sheath. Cable ducts after being constructed or laid may be impregnated with a solution of soluble silica or coated on the inside duct surface with soluble silica.

However, in the case when the soluble silicate is introduced in the concrete mixture, the concrete should be of such composition that water permeating through it or forming a solution by contact with it should have—silicate ion content of not less than that of saturated solution of calcium silicate; hydrogen ion content or not less than 1×10^{-11} grams per liter of solution.

What is claimed is:

1. The method of preventing the corrosion of lead alloy cable sheath enclosed in concrete ducts which consists in producing a saturated silicate condition adjacent the lead sheath which forms or causes to be formed a coating of an insoluble film on the lead sheath.

2. The method of preventing the corrosion of lead alloy cable sheath enclosed in concrete ducts which consists in producing a saturated silicate condition adjacent the lead sheath which forms or causes to be formed a coating of lead silicate on the sheath.

In witness whereof, I hereunto subscribe my name this 15th day of March, 1929.

ROBERT M. BURNS.