

UNITED STATES PATENT OFFICE.

HERBERT PASCHKE, OF NEW YORK, N. Y.

WATERPROOFING AND PROCESS OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 780,379, dated January 17, 1905.

Application filed February 5, 1904. Serial No. 192,125.

To all whom it may concern:

Be it known that I, HERBERT PASCHKE, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Waterproofing and Process of Making the Same, of which the following is a full, clear, and exact description.

10 This invention relates particularly to improvements in the waterproofing of subterranean walls—for instance, to the walls of railway-tunnels; but it is useful in various other connections, as will be apparent to persons skilled in the art.

15 In modern tunnel construction it has been found to be both disadvantageous and dangerous to employ open fires and other means for heating pitch and similar substances which heretofore have been commonly employed for waterproofing tunnel-walls; and the prime object of the present invention is to provide a system by which these tunnel-walls may be rendered thoroughly waterproof without the use of heat generated in any manner.

20 To this end I provide a waterproof covering formed of sheets of fabric or the like saturated and coated with a waterproof substance and united in a cold state by causing the waterproof substance of all the sheets to amalgamate into a homogeneous mass by applying a cold solvent to the waterproof substance with which the sheets are coated. Preferably this solvent is combined with the basic element of the waterproof substance with which the sheets are saturated, so as to control the solvent and insure its proper action without the employment of heat in any form.

40 I will specifically describe, as an example of my invention, the preferred manner of employing the same in tunnel construction. First, I take sheets of burlap or other fabric and saturate and coat the same with a pitch-like waterproof substance. Preferably I employ a material commercially known as "cerion," which is a residual product of the refinement of crude petroleum and is composed (as nearly as I can ascertain) of a highly-pure

bitumen or asphalt base and certain gummy products of petroleum. The cerion is heated, and the burlap sheets are saturated and coated therewith, and after being cooled and consequently set are then ready for application. In tunnel construction the waterproofing is applied to tunnel-walls of brick, concrete, and the like either over the surface or between two strata thereof. Also in many classes of work it is necessary to superimpose two or more of the fabric sheets. The tunnel-walls of brick, concrete, or the like are to a certain extent porous, and in applying the waterproofing to these walls I use an amalgamating solution composed basically of the same substance with which the fabric is saturated and coated and having in addition a light volatile oil constituting a solvent of the basic substance. In the case of cerion, which, as before stated, I prefer to use, the amalgamating solution is formed of cerion, with which is mixed a certain quantity of naphtha, which being a solvent of the cerion will cause the amalgamating solution to take the form of a stiff paste-like substance. The amalgamating solution is then spread over the surface of the wall to be covered, and the sheet of the saturated fabric is applied over the amalgamating solution. The naphtha in the amalgamating solution acts as a solvent of the cerion, forming the coating of the fabric sheet and in dissolving the cerion causes it to amalgamate with the bonding solution as one homogeneous mass. At the same time the volatile naphtha or other equivalent oil in evaporating will pass into the porous wall and having effected a dissolution of the cerion the naphtha in passing into the porous wall will carry with it a certain quantity of the dissolved pitch-like substance, thus bringing about an intimate and thorough connection between the coated and saturated fabric and the pores of the wall itself. As the naphtha evaporates the cerion resumes its set form and in the course of time will take a permanent set.

In some classes of work a single sheet of the fabric applied as above will be sufficient, while under severe conditions several sheets

will be required. To apply a second sheet, a second coating of the above-described amalgamating solution should be applied to the surface of the first-laid sheet of fabric and the second sheet of fabric pressed thereon. The result will be the same as before described except that the cerion of the two fabric sheets will amalgamate to form a homogeneous binding substance between the two sheets. If desired, the waterproof sheets thus applied may be left uncovered or a third coat of the amalgamating solution may be applied to the second fabric sheet, and a cement, brick, or other equivalent wall constructed against the same, so that the dissolved cerion against which this second wall is constructed will permeate the pores thereof the same as before explained with respect to the first wall.

In connection with the amalgamating solution composed basically of the same substance with which the fabric is saturated, and in addition a volatile oil constituting a solvent of the basic substance, I desire to point out that the volatile oil is employed for the purpose of dissolving the basic substance with which the fabric is coated and causing the substance to run together and form an absolute bond, either between the two sheets of fabric or between the fabric and the porous wall. The basic material is employed in the amalgamating solution for the purpose of suspending or retarding the evaporation of the volatile solvent and to allow the same to be uniformly applied to the surface of the coated fabric and to cause the solvent to act uniformly thereon. In this manner I retard the evaporation of the volatile solvent, giving it time to act on the cerion or other substance with which the fabric is coated and also giving the solvent time to permeate the pores of the porous wall and carry therein a portion of the dissolved cerion. In this manner I produce a thoroughly effective and homogeneous waterproofing without the employment of heat in any form, excepting that required first to saturate the fabric sheets, and this of course may be done at any time and place irrespective of the actual laying of the waterproof covering. Further, I cause the waterproofing to assume intimate association with the walls of the tunnel or other structure to which it is applied, irrespective of the temperature conditions and the state of the structure with respect to the dampness of its walls. In cases where wet concrete or the like is brought in association with the cerion dissolved by the amalgamating substance the evaporation of the volatile oil is delayed until the walls begin to dry, and as this drying process goes on the evaporation of the volatile solvent will begin and will carry off with it part of the dissolved cerion, thus charging the pores on the surface of the wall with the parts of the cerion compound, which will

set therein after the solvent has completely evaporated.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The improvement in the art of waterproofing surfaces, which consists in interposing a cold amalgamating solution between the surfaces to be coated and a cold-set soluble waterproof substance the amalgamating solution being composed basically of the said waterproof substance and a volatile solvent of the same, and in applying said waterproof substance to the said surface with the amalgamating solution intervening and before the evaporation of said solvent in the said amalgamating solution, the base of said amalgamating solution retarding the evaporation of the solvent sufficient to allow the solvent to soften the waterproof substance and bring about its adherence to the surface to be coated.

2. The improvement in the art of waterproofing surfaces, which consists in interposing a cold amalgamating solution between the surface to be coated and a cold-set waterproof surface formed of the residual production of the refinement of petroleum and containing bitumen or asphalt and the gummy products of the refinement of petroleum the said amalgamating solution being composed basically of the said waterproof substance and a volatile solvent of the same, and in applying said waterproof substance to the said surface with the amalgamating solution intervening and before the evaporation of the said solvent in said amalgamating solution, the base of the said amalgamating solution retarding the evaporation of the solvent sufficient to allow the solvent to soften the waterproof substance and bring about its adherence to the surface to be coated.

3. The improvement in the art of waterproofing, which consists in coating two fabric-sheets with a waterproof substance and allowing the said waterproof substance to set and harden, in interposing between the coatings of said sheets when in a cold-set state a cold amalgamating solution composed basically of said waterproof coating of the sheets a volatile solvent of the same, and in pressing the sheets together before the solvent of the amalgamating solution is evaporated, the base of said amalgamating solution retarding the evaporation of the solvent sufficient to allow the solvent to soften the waterproof substance of the coatings and bring about a coherence of said coatings.

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

HERBERT PASCHKE.

Witnesses:

ISAAC B. OWENS,
JNO. M. RITTER.

It is hereby certified that in Letters Patent No. 780,379, granted January 17, 1905, upon the application of Herbert Paschke, of New York, N. Y., for an improvement in "Waterproofing and Process of Making Same," errors appear in the printed specification requiring correction, as follows: On page 2, line 89, the word "surface" should read *substance*, and on same page, line 112, the word *and* should be inserted at the end of the line; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 31st day of January, A. D., 1905.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.