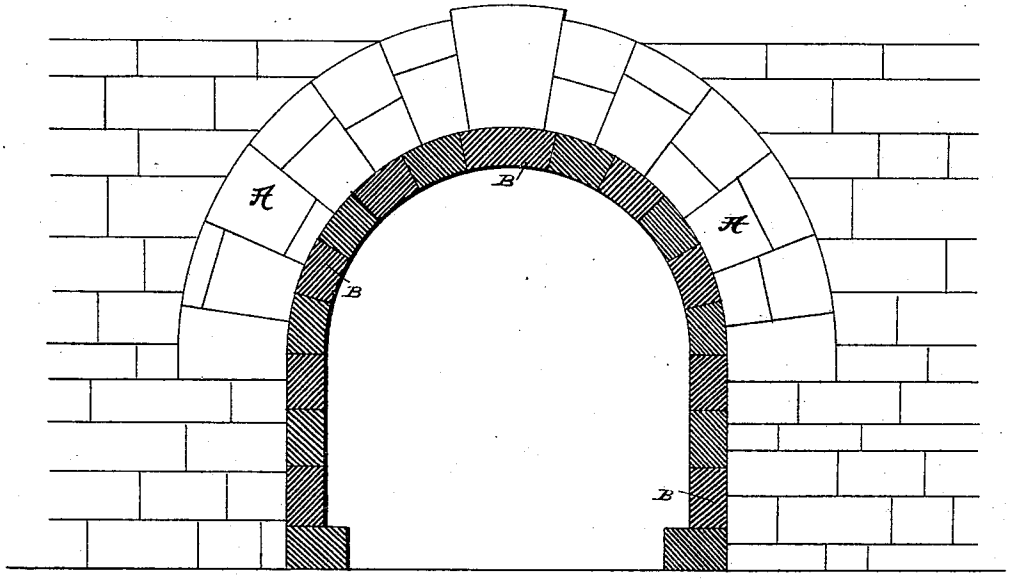
(No Model.)

C. C. GILMAN.

CONSTRUCTION OF TUNNELS.

No. 345,046. Patented July 6, 1886.



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UNITED STATES PATENT OFFICE.

CHARLES CARROLL GILMAN, OF ELDORA, IOWA.

CONSTRUCTION OF TUNNELS.

SPECIFICATION forming part of Letters Patent No. 345,046, dated July 6, 1886.

Application filed April 2, 1886. Serial No. 197,541. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARROLL GILMAN, of Eldora, Hardin county, Iowa, have invented a new and useful Improvement in the Construction of Tunnels, Subways, or Arches, of which the following is a specification.

The object of my invention is to render tunnels, subways, arches, and similar structures water-proof, to provide a good insulation for the wires devoted to electrical service that may be placed therein, and to accomplish these results by a construction which is light, indestructible, and relatively inexpensive.

To this end my invention consists in providing a brick or stone tunnel, subway, or arch with a lining of terra-cotta lumber or a porous earthenware product saturated or deeply coated with asphalt.

In the accompanying drawing, forming part of the specification, is represented a cross-section of an arch, subway, or tunnel constructed in accordance with my invention.

In said drawing, A represents the stone or brick work of the tunnel, and B the blocks of terra-cotta lumber, saturated or deeply coated with asphalt. The terra-cotta lumber which I use must be distinguished from ordinary terra-cotta. The latter is porous, but only to a slight extent as compared with the former. The terra-cotta lumber is produced by mixing vegetable with earthen matter and burning out the vegetable matter in the kiln, leaving the material extremely porous, the degree of porosity depending upon the proportion of vegetable to earthen matter. This material is not materially affected by heat or cold, is a non-conductor of electricity, and can be saturated or deeply coated with asphalt. The saturation or impregnation of the material with asphalt is most thoroughly accomplished by heating it in an exhausted receiver and admitting the asphalt thereto while the air is exhausted and the material in a heated condition. I line or form the inner surface of a subway, arch, or tunnel of this porous material saturated or deeply coated with asphalt. I bond the blocks with asphalt, instead of with cement or mortar, and thus secure a tight and water-proof joint. As the blocks of terra-cotta lumber are saturated or deeply coated with asphalt, and as they are united by a bond of the same material, there is no possibility of any leakage of water from the surrounding earth into the tunnel. The blocks may be laid upon each other and held in place by the key-stone, as illustrated in the drawing, or they may be nailed or otherwise secured to the mortar joints of the brick or stone work, as the terra-cotta lumber will readily receive nails. In carrying wires for the electrical service through such a tunnel it is unnecessary to take the usual precautions to secure insulation, as both the terra-cotta lumber and the asphalt are bad conductors of electricity, and it will only be necessary to provide proper supports for the wires and cables that may pass therethrough. Subways or tunnels may be constructed with such a lining; or any existing structure of this character may be provided therewith. The lining may also be placed without instead of within, and serve as a means of waterproofing.

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

1. A subway, arch, tunnel, or similar structure provided with a layer of terra-cotta lumber coated or saturated with asphalt, substantially as described.

2. A subway, tunnel, arch, or similar structure, the inner surface of which consists of or is lined with terra-cotta lumber coated or saturated with asphalt, substantially as described.

3. A subway, tunnel, arch, or similar structure having an inner surface or lining formed of blocks of terra-cotta lumber coated or saturated with asphalt and bonded together with the same material, substantially as described.

In testimony whereof I have signed my name in the presence of two witnesses.

CHARLES CARROLL GILMAN.

Witnesses:
THOMAS RIDER,
AMBROSE RISDON.