J. C. GOODRIDGE, Jr.

METHOD OF REPAIRING STRUCTURES WITH BETON OR CONCRETE.

No. 193,865, Patented Aug. 7, 1877.

Fig. 1.

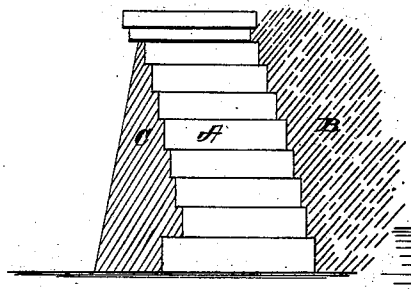


Fig. 3.

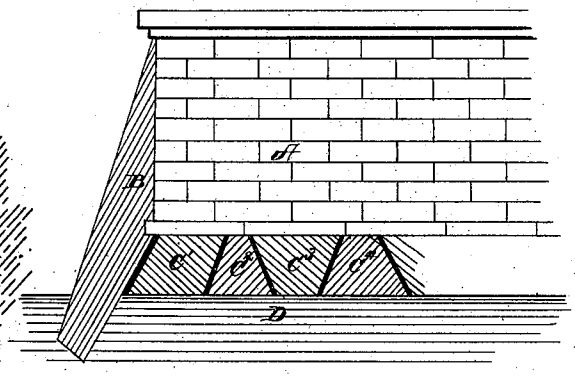
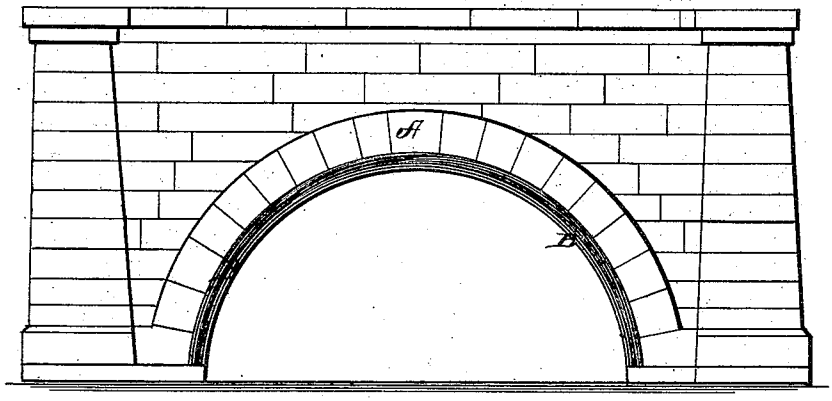


Fig 2.



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IMPROVEMENT IN METHODS OF REPAIRING STRUCTURES WITH BETON OR CONCRETE.

Specification forming part of Letters Patent No. **193,865**, dated August 7, 1877; application filed March 21, 1877.

To all whom it may concern:

Be it known that I, JOHN C. GOODRIDGE, Jr., of the city of New York, and State of New York, have invented a new and useful Method of Repairing Structures with Beton or Concrete; and I hereby declare that the following is a full and exact description thereof, reference being made to the plate which accompanies and forms part of this specification.

This invention relates to the repairing, strengthening, replacing, protection, and preservation of structures formed wholly or in part of stone, brick, metal, or of rock, in its natural position by the employment of beton or concrete. Repairs may become necessary from imperfect construction, disintegration, oxidation, friction, pressure, or concussion.

The material to which the beton is to be applied should first be carefully cleaned, the joints thoroughly raked out, and all loose fragments removed. It should then be washed with a mixture of lime and water and a small quantity of cement. This assists the beton in forming a bond. Care should be taken that no unslaked lime gets into the work. Molds of wood or metal, or a wall of masonry, is then placed, and firmly fastened and braced, at a distance from the old structure or material, decided upon as the proper thickness of the beton. The mold is then filled with beton, layer by layer, and thoroughly rammed and forced into all joints, crevices, irregularities, and inequalities of surface. This process is continued until the beton is carried as high as necessary. After the beton has set, which will be in from two to ten days, the molds may be removed.

Figure 1 shows a retaining-wall, A, thrust out of alignment by the bank B. The beton mass C is joined to the wall A in the manner described, and A and C form a wall which is stable, and capable of supporting the thrust of the bank. Fig. 2 shows an arch, A, strengthened by the beton lining B. A mold is placed in the arch, and at a proper distance from it. The space between the arch and mold is then carefully filled with beton. This attaches itself to the arch and fills all joints and irregularities, so that water cannot get between it and the old structure. A new structure may be made by first placing a lining of beton and then placing the stone or other material upon that. When the top of an arch to be repaired is accessible it may be uncovered, all old filling removed, and the beton placed upon the old structure, using it as a mold. Fig. 3 shows the method of replacing a foundation, A being the tower-wall or pier, C the foundation which is to be replaced, and D a firm soil or rock below, to which it is desirable to transfer the weight. Should the old foundation C be very uncertain, the buttress B should first be made of beton. Section 1 of C is then removed and replaced with beton; next, section 3, and so alternately. Then return to 2 and 4; or they may be taken in regular order if time is allowed between each replacement for the beton to harden. In this manner any structure or its foundation may be replaced, section by section. The beton, completely filling the space occupied by the material removed, prevents any settling, and allows the structure to be used for the purposes for which it was constructed during the time occupied by its repair. If the surface of a structure is deteriorating, or not strong enough, from any cause, or if water, getting inside, separates its component parts, as happens particularly in river piers and abutments, it may be entirely incased in beton and its whole surface covered.

I do not claim as new the building of new structures entirely of beton or concrete, or the backing of new structures having a stone face, or of plastering of masonry by means of trowels and floats, as is done in mastic work.

What I claim, and desire to secure by Letters Patent, is—

The within-described method of repairing and replacing structures formed wholly or in part of stone, brick, or metal, or rock in its natural position, by the employment of beton or concrete, substantially in the manner set forth.

JOHN C. GOODRIDGE, JR.

Witnesses:

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