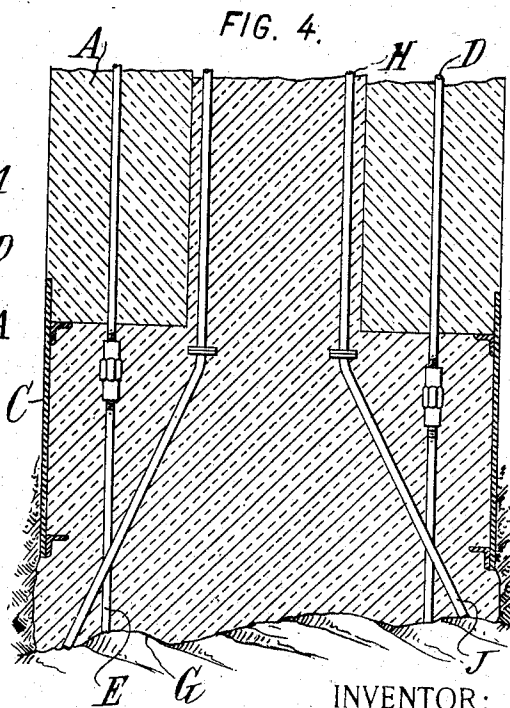
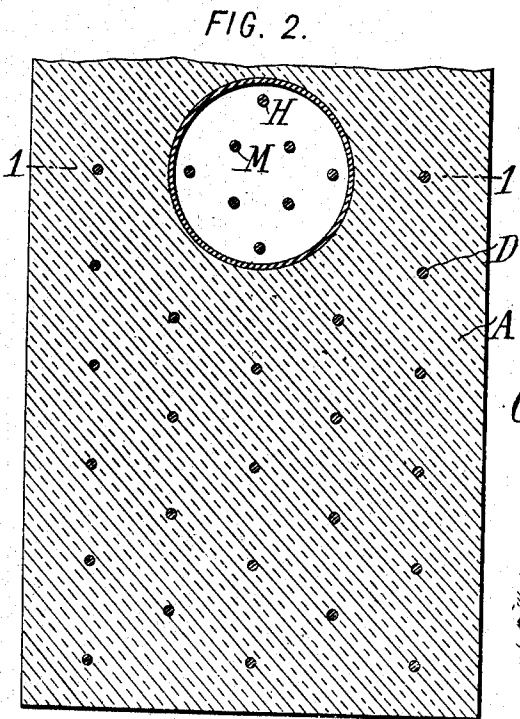
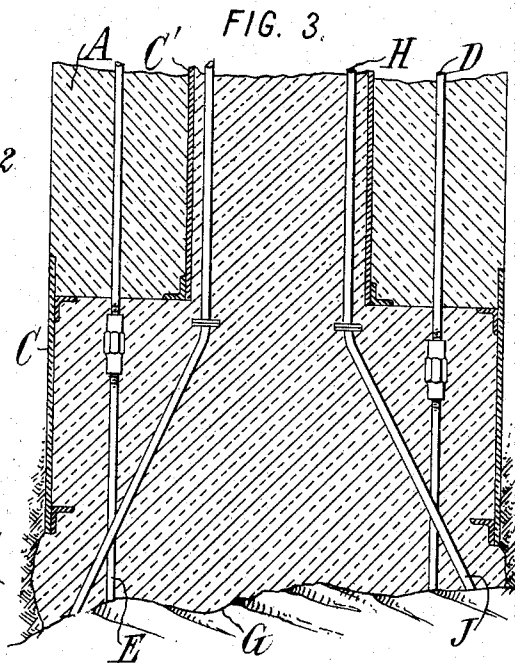
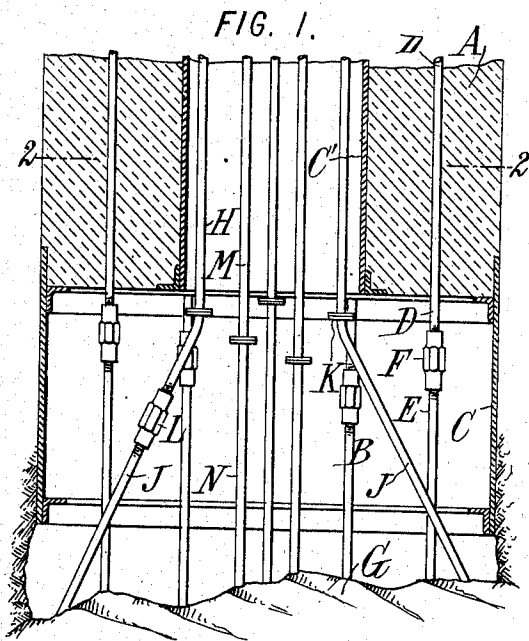


No. 830,516.

PATENTED SEPT. 11, 1906.

D. E. MORAN.
CONSTRUCTION AND SINKING OF CAISSONS, &c.
APPLICATION FILED JUNE 21, 1906.



WITNESSES:
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INVENTOR:
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UNITED STATES PATENT OFFICE.

DANIEL E. MORAN, OF MENDHAM, NEW JERSEY.

CONSTRUCTION AND SINKING OF CAISSONS, &c.

No. 830,516.

Specification of Letters Patent.

Patented Sept. 11, 1906.

Application filed June 21, 1906. Serial No. 322,676.

To all whom it may concern:

Be it known that I, DANIEL E. MORAN, a citizen of the United States, residing at Mendham, in the county of Morris and State of New Jersey, have invented certain new and useful Improvements in the Construction and Sinking of Caissons or the Like, of which the following is a specification.

In my application for patent, Serial No. 321,845, filed June 15, 1906, I have described a method of reinforcing caissons or piers by introduction of steel into the concrete and preferably forming a continuous metallic connection between the superimposed load and the subfoundation and have claimed the same broadly. The present invention provides another method of reinforcing which is specifically distinct from that upon which the broad claims in the aforesaid application are based and which has peculiar features of advantage, the method of the present invention being applicable either alone or in connection with that of the above application or in connection with various other systems.

An important feature of the present invention is the introduction of the reinforce after the caisson is sunk to the desired depth. The reinforce is introduced in the form of plain or shouldered rods or other suitable shapes through the shaft, the bases of the rods being carried down to the natural subfoundation of rock or to any suitable artificial subfoundation and the rods being extended upward continuously through the shaft, so that when the working chamber and shaft are subsequently filled with concrete the rods become embedded therein and serve to assist the concrete in carrying the strain of the superimposed load directly to the subfoundation. For small caissons this method of reinforcement might be used alone. I have illustrated it in connection with a caisson of considerable size, the portions outside of the shaft being reinforced in accordance with the system described in my aforesaid application.

Referring to the embodiments of the invention illustrated, Figure 1 is a section on the line 1 1 of Fig. 2, showing the caisson sunk to its final position and the reinforcing-rods set up. Fig. 2 is a cross-section of the same on the line 2 2 of Fig. 1. Figs. 3 and 4 are vertical sections similar to Fig. 1, showing the usual filling of concrete introduced

into the working chamber and shaft, the shaft-lining being left in place in Fig. 3 in accordance with the usual practice and the shaft-lining being removed in Fig. 4 in accordance with the invention of myself and John W. Doty, described in our application, Serial No. 309,850.

Referring to the embodiments illustrated, Fig. 1 shows a caisson substantially as claimed in the application of myself and John W. Doty, Serial No. 76,767, the body A of the caisson being of concrete and forming the roof of the working chamber B, the walls C of which are of metal. The shaft is provided with a lining C'. For the purpose of additional reinforcement as above described the concrete body A of the caisson is molded with rods D embedded therein and extending down into the working chamber and adapted to be attached to extension-rods E by means of a turnbuckle F or the like, so as to extend entirely to the subfoundation G of rock. After this or any other suitable caisson is sunk to the proper depth I set up upon the rock foundation and within the working chamber a number of rods which may be distributed over the area of the rock according to any desired arrangement and which may likewise be braced in any suitable way, and I extend these rods up through the shaft. In the example shown a series of outer rods H are provided with inclined lower end members J, to which they are connected by any suitable means—such, for example, as the flange-joints K. Any one or more of the rods J may be provided with turnbuckles L to accurately adjust its length. In addition I propose to provide an inner set of rods M, the lower end members N of which are vertical. These rods may be introduced by the men while filling in the working chamber with concrete, and after substantially all of the chamber has been filled as the men back out through the shaft the upper members of the rods may be attached to the lower members.

Where the shaft-lining remains in place, as in Fig. 3, the concrete in the shaft will be divided from that outside of the shaft; but as the pressure is directly vertical this is not a serious matter. I may, however, utilize the shaft also as a reinforcement by providing a support therefor extending to the subfoundation, as described in detail in my

first above-mentioned application. Where the shaft-lining is withdrawn, however, as in Fig. 4, the concrete within the shaft forms practically a monolith with the concrete forming the body of the caisson.

Various other reinforcing systems may be used in connection with those described.

Though I have described with great particularity of detail certain specific embodiments of the invention, yet it is not to be understood therefrom that the invention is limited to the specific embodiments disclosed. Various modifications thereof in detail and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention.

What I claim is—

1. The method of reinforcing a caisson or pier, which consists in sinking the caisson and providing it with metal extending up through the shaft, and subsequently embedding this metal in concrete.

2. A caisson or pier having a reinforce within the shaft.

3. A caisson or pier having a reinforce within the shaft, said reinforce consisting of rods extending from the subfoundation continuously to the top of the caisson.

4. A caisson or pier having a metallic reinforce within the shaft comprising vertical portions H, and inclined lower end members J connected thereto and resting at their lower ends upon the subfoundation.

5. A caisson or pier having a metal member extending upward through the shaft and resting at its lower end on the subfoundation.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

DANIEL E. MORAN

Witnesses:

DOMINGO A. USINA,
THEODORE T. SNELL.