

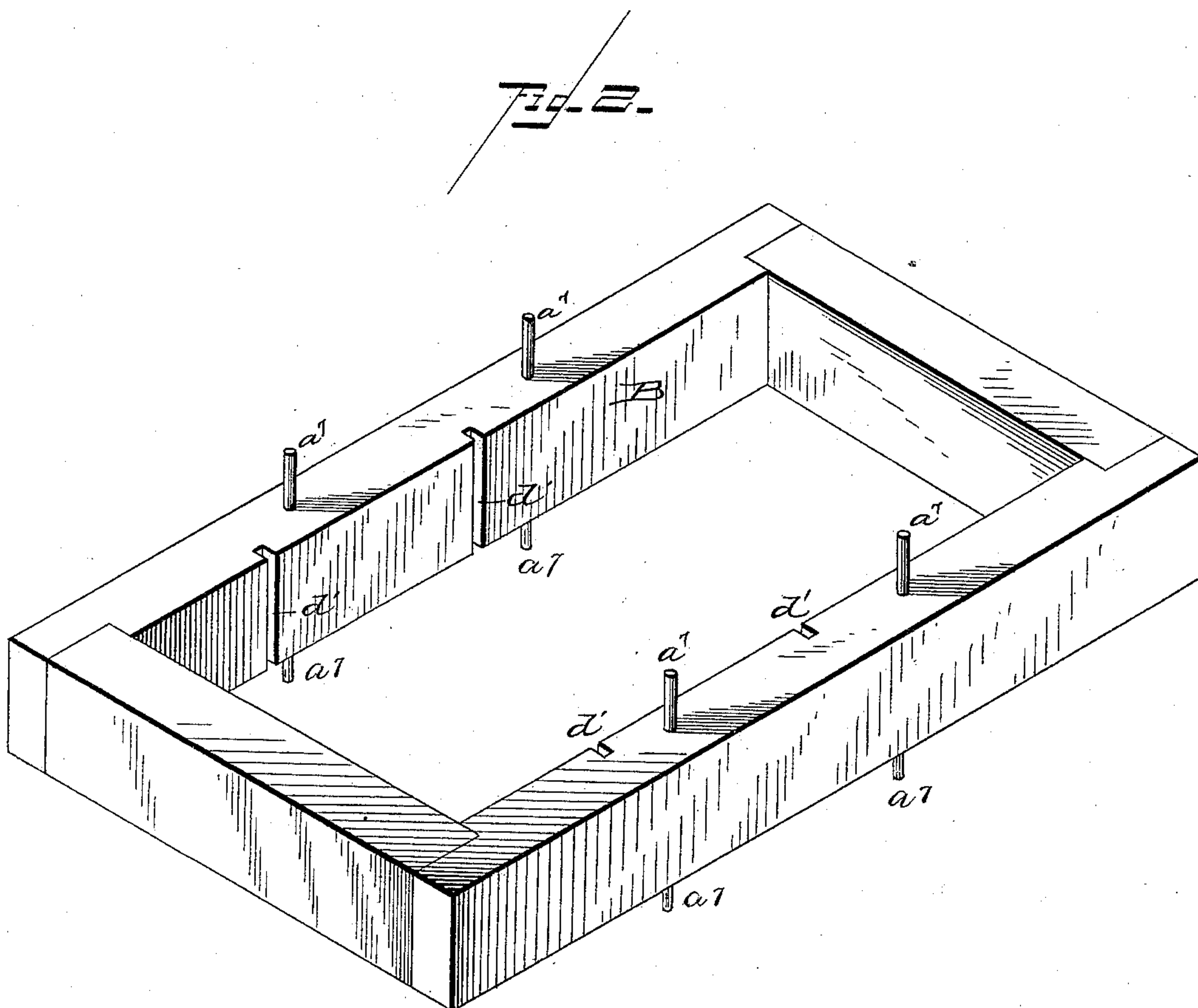
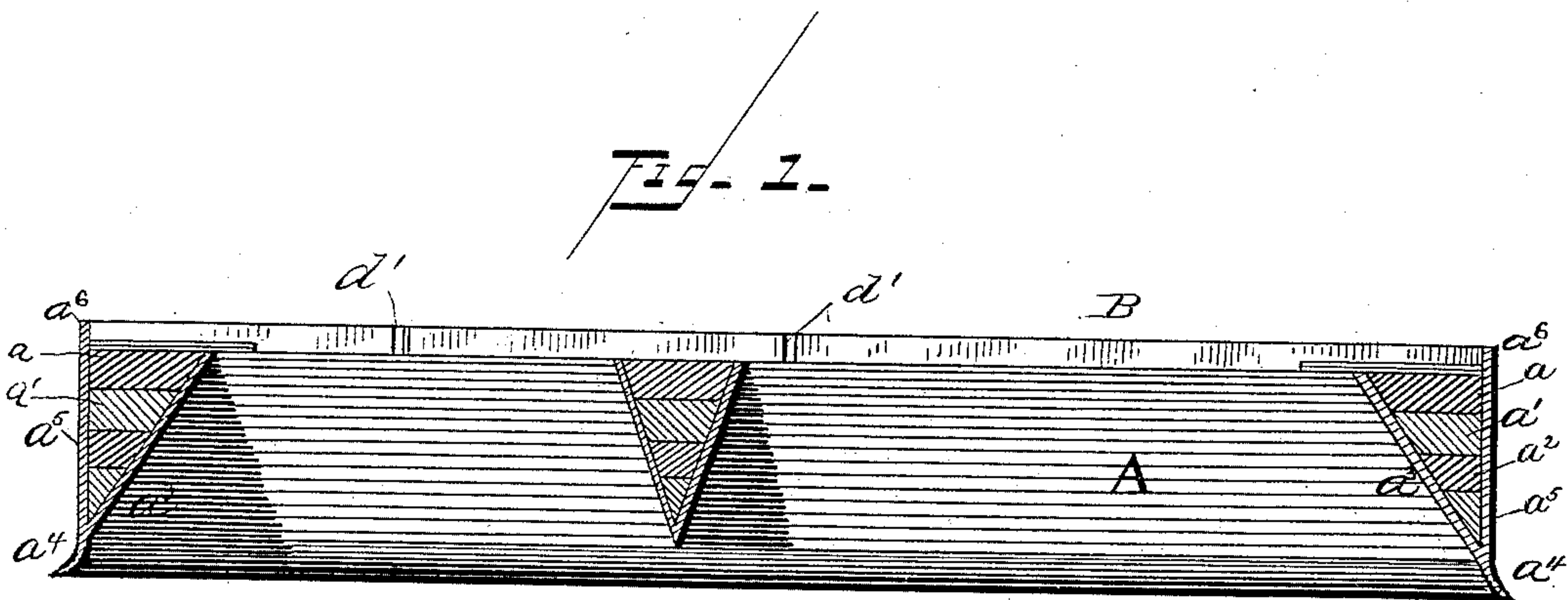
(No Model.)

2 Sheets—Sheet 1.

S. A. BOWE.
MINING CAISSON.

No. 397,688.

Patented Feb. 12, 1889.



WITNESSES.

F. L. Ourand.
R. M. Clisby.

INVENTOR,

Silas A. Bowe. INVENTOR.

by *Louis Dugger & Co.*
Attorneys.

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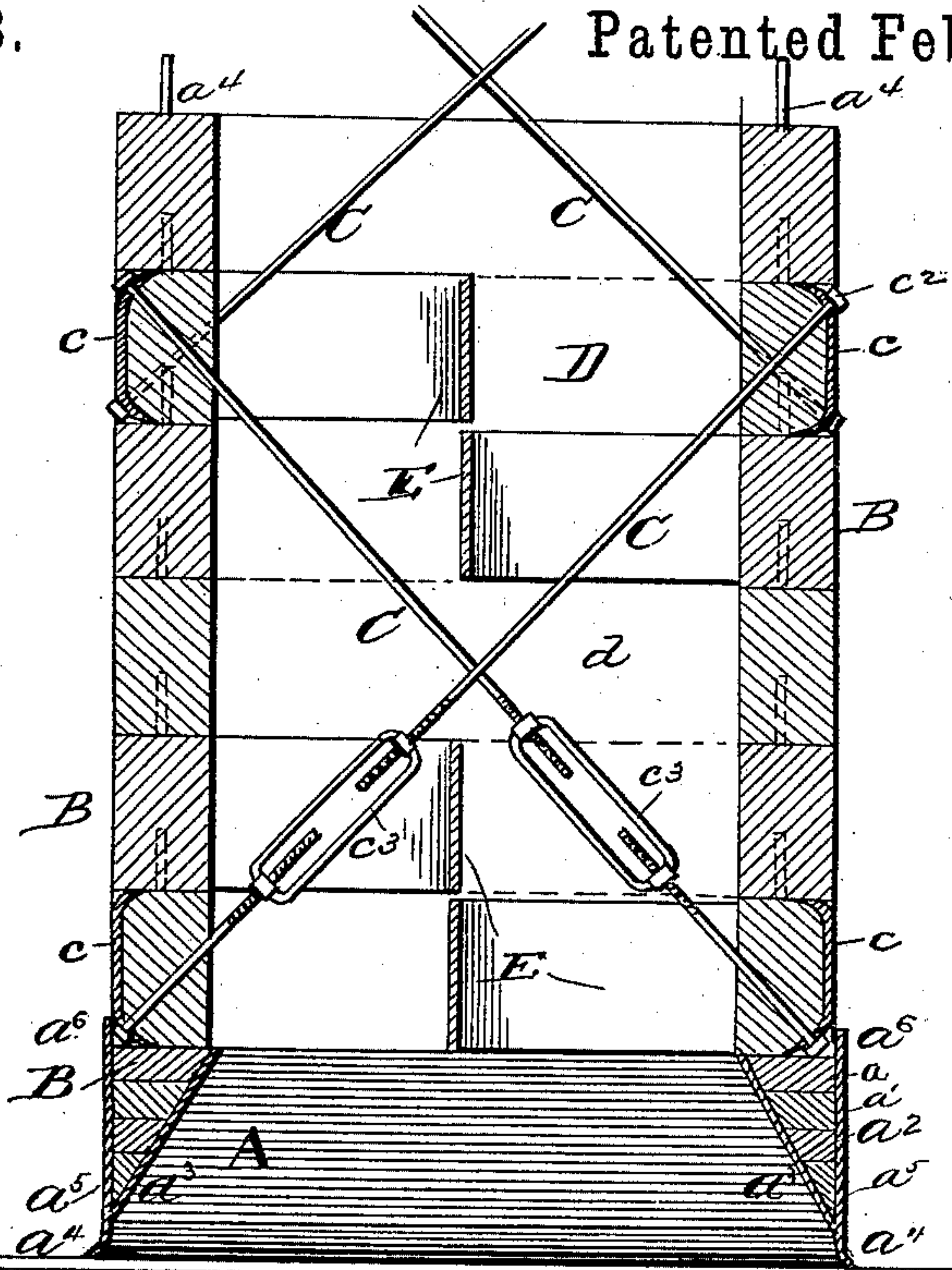
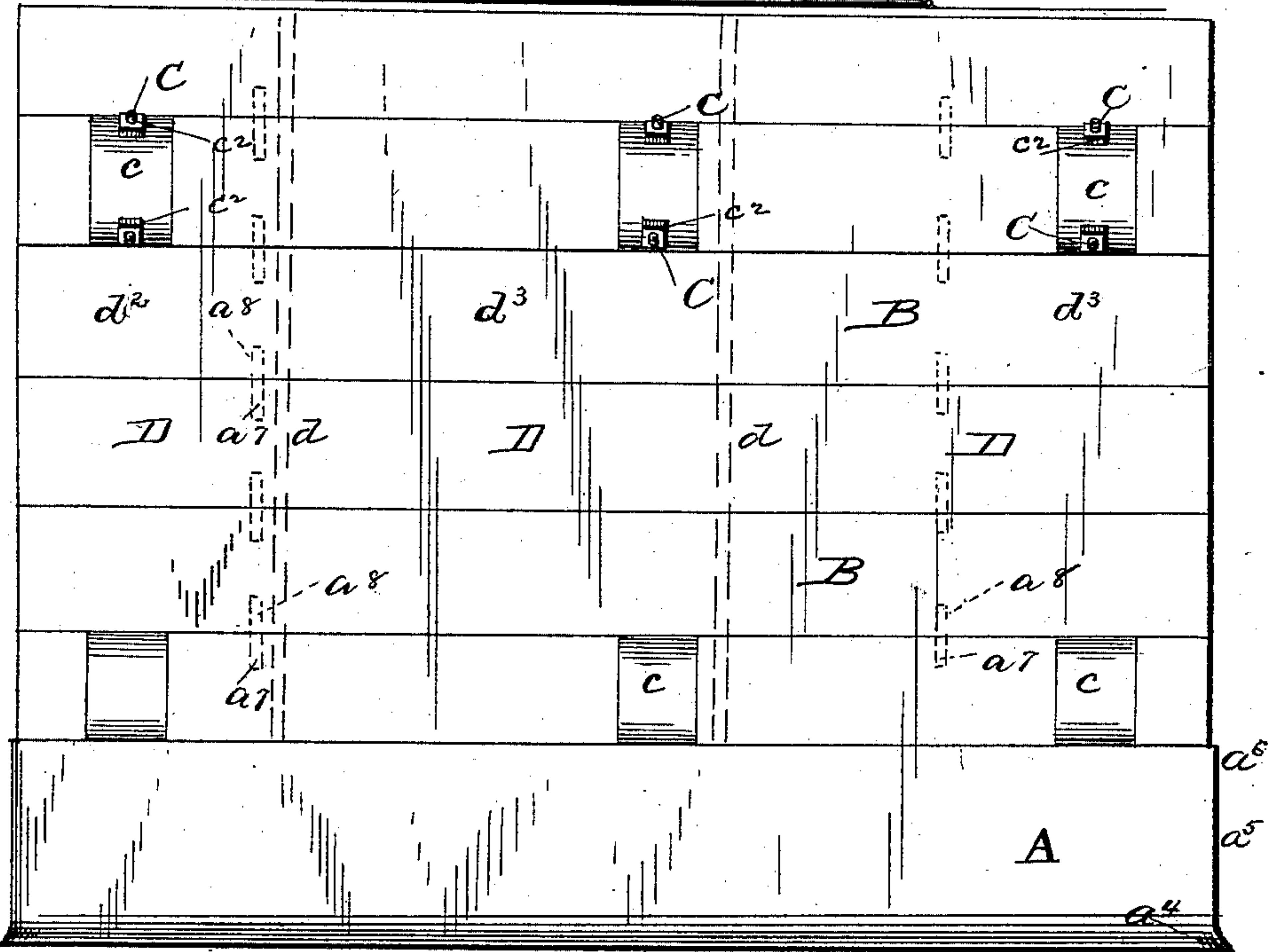


Fig. 3.



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Fig. 4.

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UNITED STATES PATENT OFFICE.

SILAS A. BOWE, OF HURON, DAKOTA TERRITORY.

MINING-CAISSON.

SPECIFICATION forming part of Letters Patent No. 397,688, dated February 12, 1889.

Application filed June 15, 1888. Serial No. 277,195. (No model.)

To all whom it may concern:

Be it known that I, SILAS A. BOWE, a citizen of the United States, and a resident of Huron, in the county of Beadle and Territory of Dakota, have invented certain new and useful Improvements in Mining-Caissons; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to mining-caissons.

The object is to produce a caisson to be used in sinking mining-shafts, which shall be so constructed that the work of excavating may be carried on without the danger of the earth caving in and thus imperiling the lives of the workmen employed, and which will also prevent the entrance of water to the shaft from the sides of the caisson when the shaft is sunk in earth that is springy or where quicksands abound; furthermore, to produce a caisson which may be drawn into a straight line should it be forced out of line by the earth on one side caving in, and thus forcing the opposite side out of line, and, finally, to produce a caisson which shall be simple of construction, efficient and durable in use, and comparatively inexpensive of production.

With these objects in view the invention consists in a base for a mining-caisson constructed of a series of metallic and wooden frames incased in a metallic jacket, having a flange extending around its lower end projecting outward and beyond the same, the outer sides of the said base being perpendicular and the inner sides inclined and converging to a point at the bottom; furthermore, in the combination, with the said base, of a frame designed to fit in a flange on the base, the said frame being provided with a number of projections on its upper and lower edges designed to fit in openings in the base, and in a frame to be placed on the first-named frame, each of the subsequent frames being constructed in the same manner, thereby enabling a constructor to build a caisson of any desired depth in the ground and securely fasten them together against lateral displacement; furthermore, in the combination,

with the said frames, of truss-rods secured thereto and connecting a number of the frames, whereby they may be drawn tightly together and thus prevent the entrance of water to the shaft at the point where two frames meet, and, finally, in the various novel details of construction whereby its objects are attained.

In the accompanying drawings, forming part of this specification, and in which like letters of reference indicate corresponding parts, Figure 1 is a vertical sectional view of the base, showing the outwardly-extending flange on the bottom and the upwardly-extending flange on the top; also the arrangement of the metal and wood of which the base is constructed. Fig. 2 is a perspective view of one of the frames of which the caisson is constructed, showing the projections thereon by which two of the frames are joined. Fig. 3 is a vertical sectional view showing a number of the frames joined and the truss-rods for clamping them securely in place, and Fig. 4 is a side elevation showing the plates secured to the frames and the ends of the truss-rods extending through the same with nuts screwed thereon.

Referring to the drawings, A designates the base on which the caisson rests. This base is constructed in the following manner: A frame is first made of the same size of the shaft to be sunk. This frame *a* is made of heavy timber—say of beams ten inches square—the outer surfaces of the sides and ends being vertical and the inner surfaces slanting, as shown, so that the bottom of the frame is about one inch narrower than the top. This frame is suitably secured at the corners to prevent the possibility of its coming apart. Below this frame is placed a frame of iron or steel, *a'*, of any desired thickness and of the same size as the wooden frame. Then another frame of wood, *a''*, is placed below the iron frame, and then another frame of iron or steel, and so on, each frame being one inch narrower at the bottom than the preceding one, the last one being but one or two inches wide. The outer surface of the base is vertical; but the inner surface is slanting by reason of the decreased width of the successive frames, as before stated. The frames are then

securely bolted together and both the inner and outer surfaces covered with sheets of iron or steel, forming a jacket for incasing the base, thus presenting a smooth surface, which
5 will prevent the earth accumulating on the base.

The inner sheet of iron or steel, a^3 , is bent out to form the flange a^4 , which extends about two inches beyond the sides of the base, and
10 thus prevents the frames of the caisson from coming in contact with the earth when the shaft is being sunk by reason of the fact that the shaft has to be larger than the frames in order to allow the base to sink as the shaft is
15 sunk. The outer sheet, a^5 , extends up and forms the flange a^6 , in which the bottom frames, B, of which the caisson is built, rest. These frames are made of heavy timber, and are joined in such a manner as to prevent
20 either the sides or ends from being crushed in by the pressure of the earth.

In building up a caisson the base A is first sunk in the ground up to the flange a^6 . One of the frames B is then placed in position on
25 the base, and is secured in place thereon by means of bolts. The workmen then dig out the earth under the base, thus allowing it to sink until the frame is level with the ground. Another frame is then placed on the first one,
30 and is held in place by the projections a^7 , which fit in openings a^8 in the said frame, as shown in dotted lines in Fig. 4. When a number of frames have been sunk, they are securely bound together by means of truss-
35 rods C, which are secured to the bottom frame and extend to the top, where they are secured by passing through the plates c on the frame and have nuts c^2 screwed on their ends to prevent their working loose.
40 The truss-rods, it will be observed, are in two pieces. One of the rods has right-hand screw-threads cut on it, and the other one left-hand screw-threads, the two being connected by means of turn-buckles c^3 . Thus,
45 should the frames be forced out of line—as by the earth on one side caving in—they may be drawn into a straight line by tightening the rods on one side and loosening those on the opposite. The turn-buckles also serve to
50 clamp the frames together to prevent the entrance of water to the shaft. In this manner a caisson of any depth may be sunk and the frames be securely clamped together and kept in a straight line. It will be observed that the
55 frame is divided into compartments D by means of partitions d , which fit in grooves d' in the frame. The smaller compartment, d^2 , is designed to admit air to the shaft, and the larger compartments, d^3 , for the buckets used
60 in taking the ore from the mine.

To prevent the frames from being crushed in while the shaft is being sunk, cross-braces E may be employed, which are removed when the earth has settled around the entire frame.

Having thus fully described my invention, 65 what I claim as new, and desire to secure by Letters Patent, is—

1. A base for a mining-caisson, consisting of a series of metallic and wooden frames incased in a metallic jacket having a flange extending 70 around and projecting beyond its lower end to prevent the earth coming in contact with the side of the base, and a flange extending beyond its upper end in which the lower frame of the caisson rests, substantially as described. 75

2. A base for a mining-caisson, consisting of a series of metallic and wooden frames having their outer sides vertical and their inner sides slanting, in combination with the jacket having its lower end bent out to form 80 a flange and its upper end extended to form a flange in which the lower frame of the caisson rests, substantially as described.

3. The combination, with the base, of metal sheets secured to the inner and outer surfaces 85 of the frames, the inner sheet being bent out to form a flange to prevent the earth coming in contact with the sides of the caisson, and the outer sheet extended up to form a flange in which the lower frame of the caisson rests, 90 substantially as described.

4. The combination of the base, the frames seated thereon and held in position against lateral displacement by means of projections on the frame engaging corresponding open- 95 ings on the base, and the truss-rods secured to the frames by means of plates and nuts, substantially as described.

5. The combination of the base, the frames secured thereto, the truss-rods for connecting a 100 number of the frames securely together, and the turn-buckles on the truss-rods for drawing the frames in line and also for clamping the frames to prevent the entrance of water to the shaft, substantially as described. 105

6. The combination, with the frames, of the grooves formed therein, designed for the reception of partitions for dividing the caisson into compartments, substantially as de- 110 scribed.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

SILAS A. BOWE.

Witnesses:

C. R. LOVELAND,
P. B. LYON.