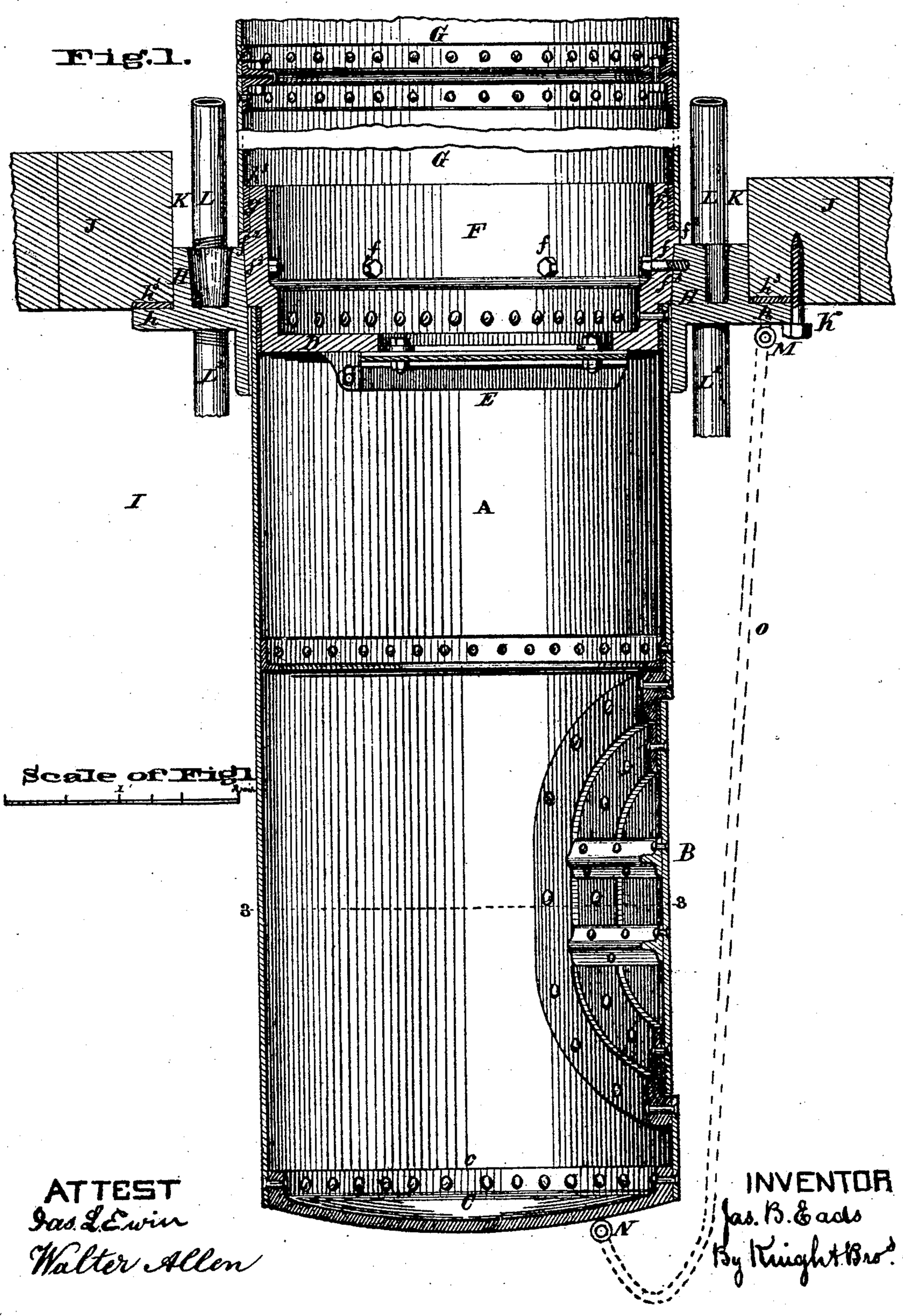
3 Sheets—Sheet 1.

JAMES B. EADS.

Improvement in Construction of Sub-Aqueous Foundations.

No. 123,002. Patented Jan. 23, 1872.

Fig. 1.



Scale of Fig 1.

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Fig. 2.

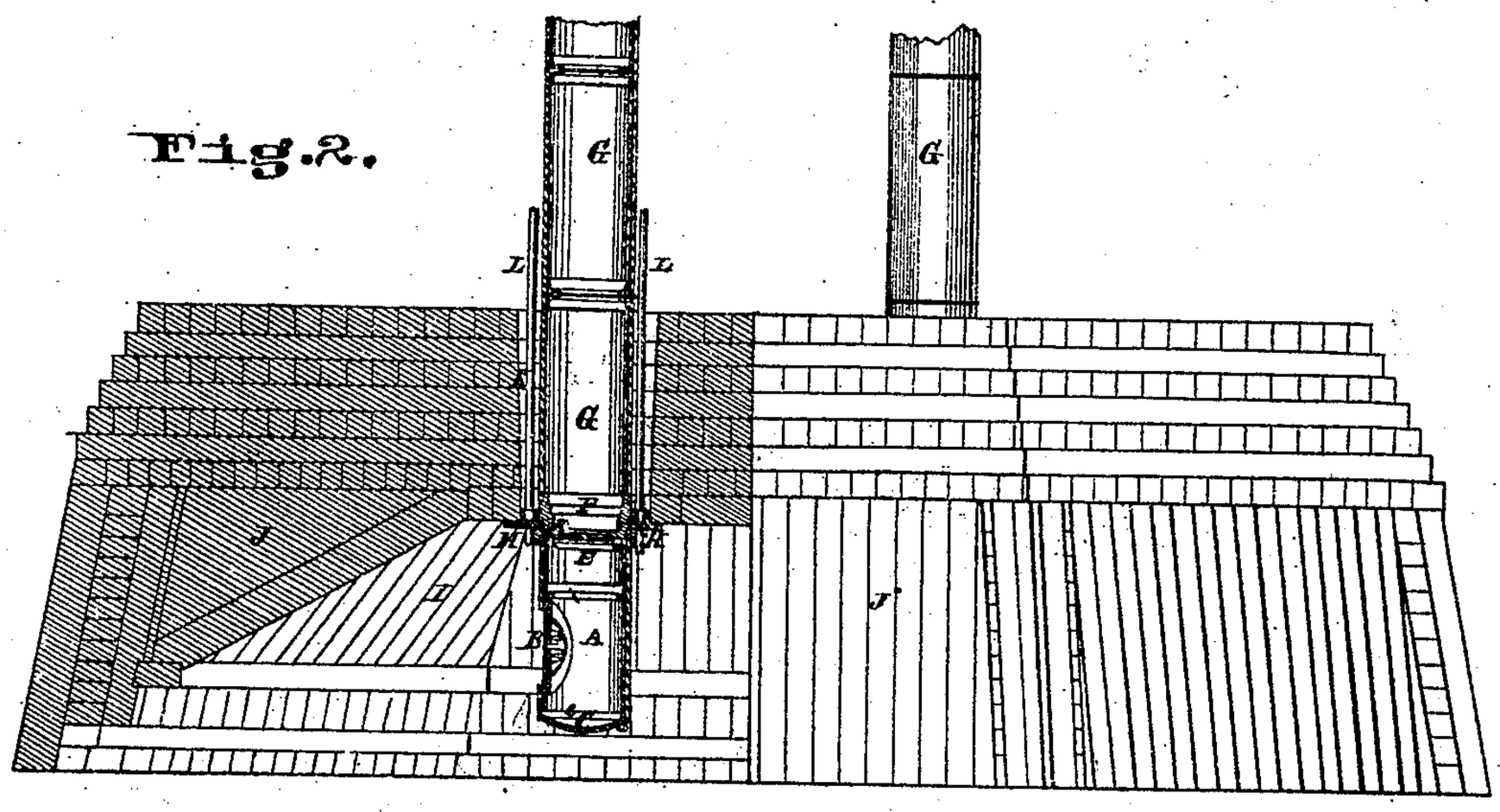
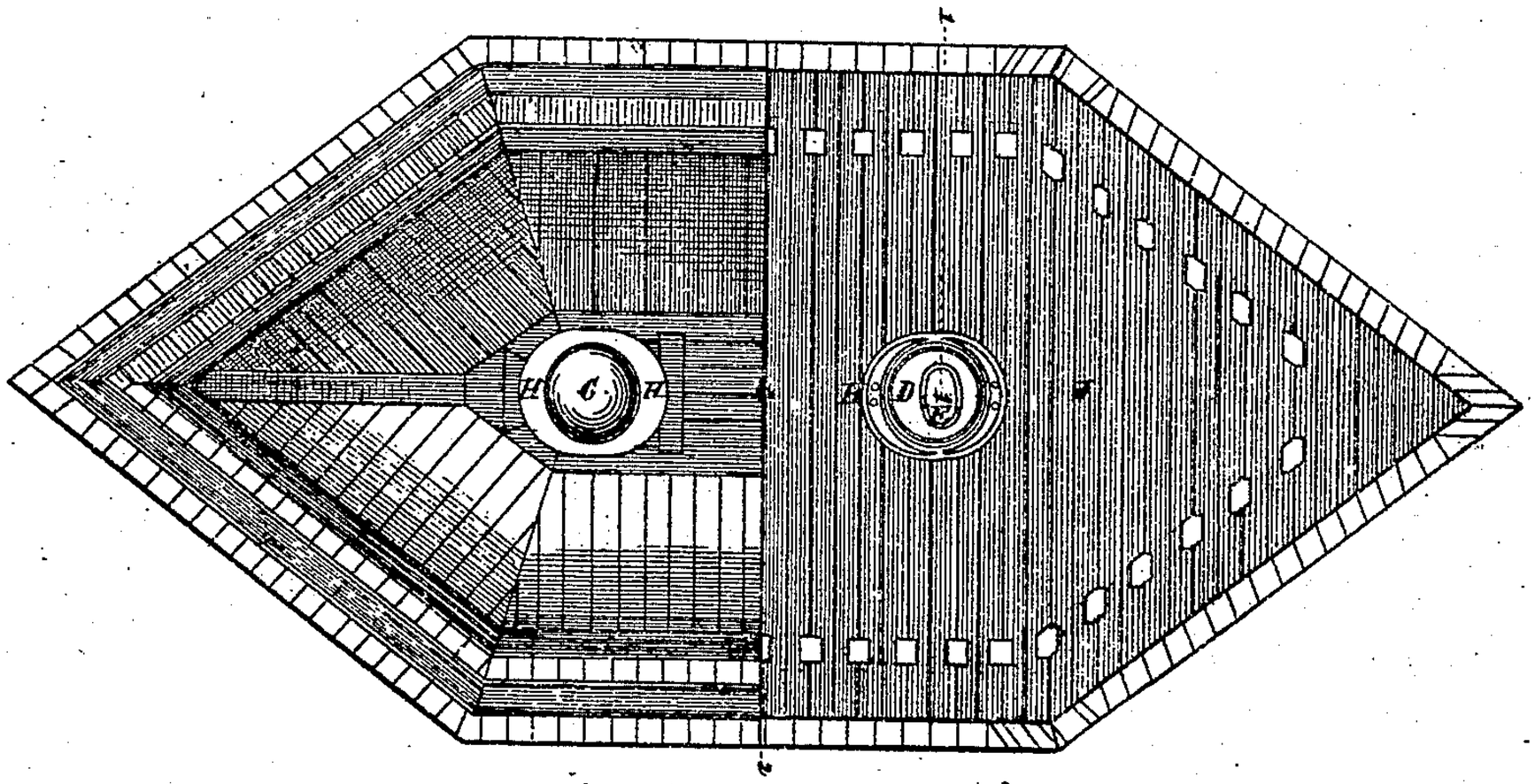


Fig. 3



Scale of Figs 2 & 3.

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Fig. 4.

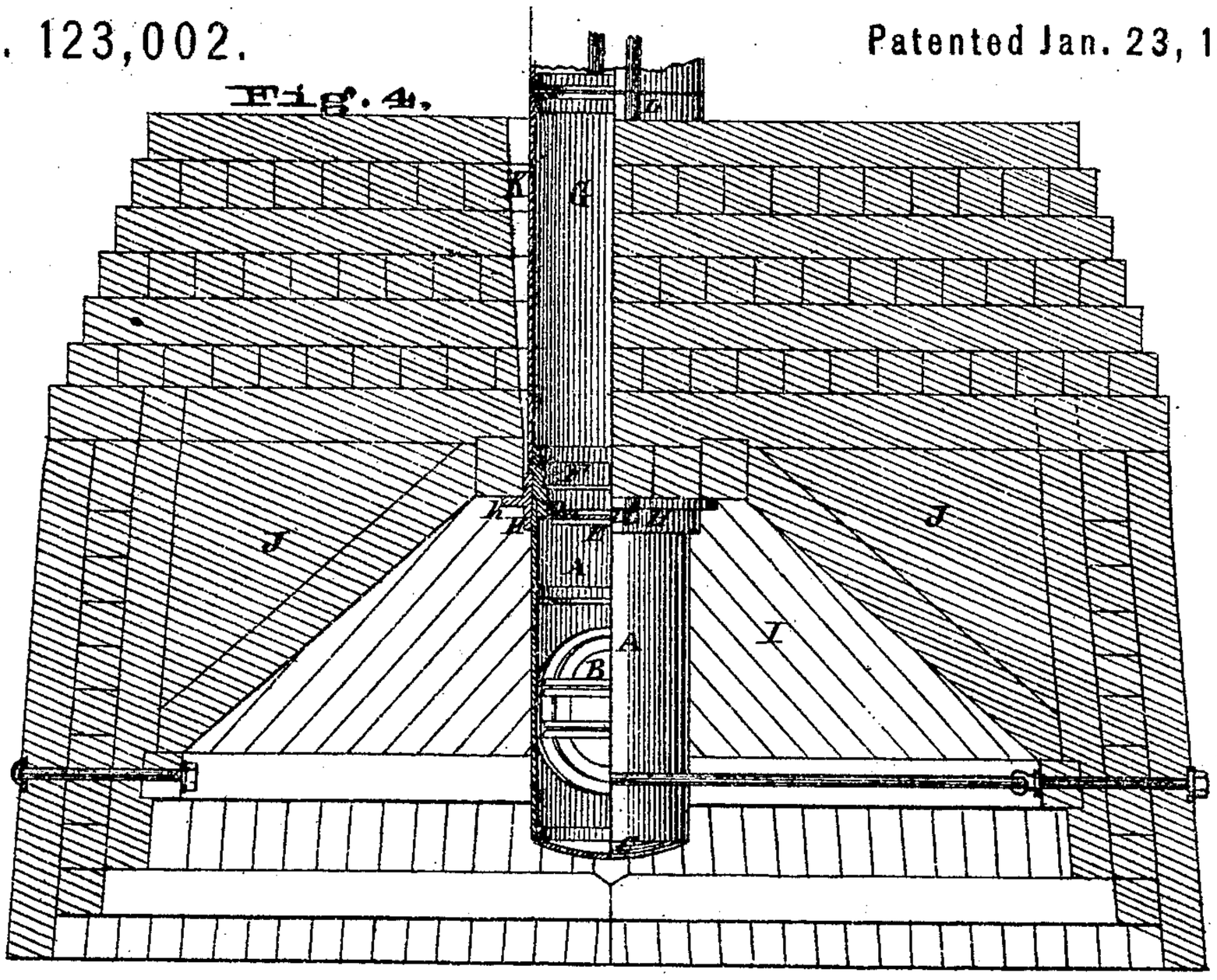
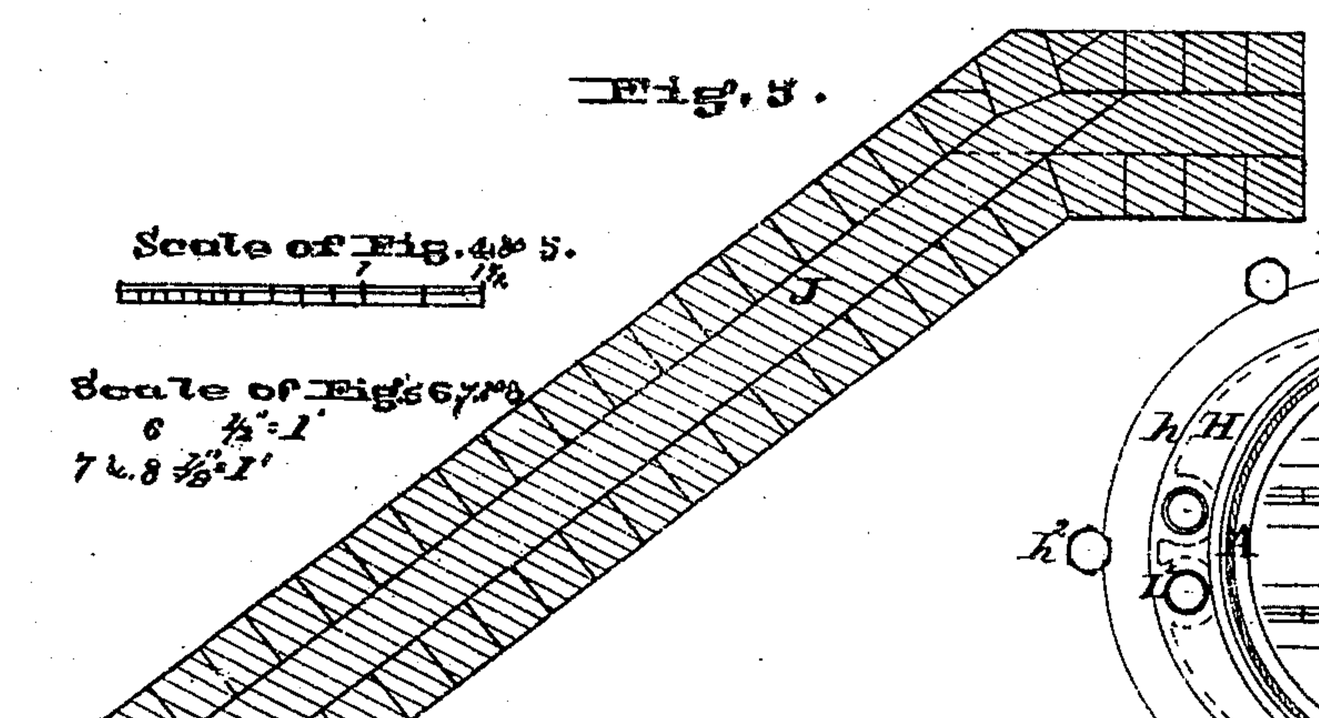


Fig. 5.



Scale of Figs. 4 & 5.

Scale of Figs 6, 7, & 8
6 ½" = 1'
7 & 8 ⅜" = 1'

Fig. 6

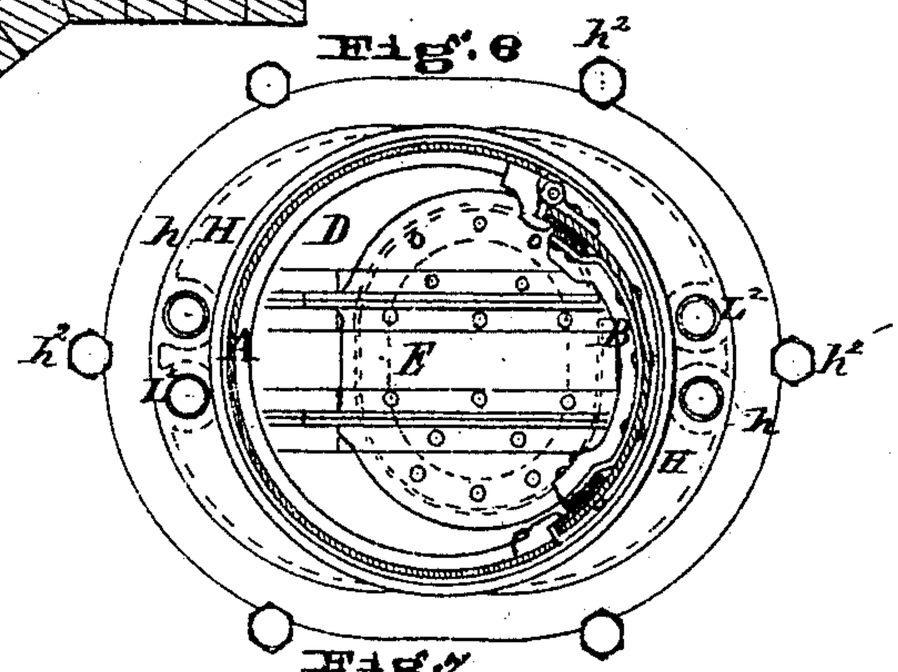


Fig. 7

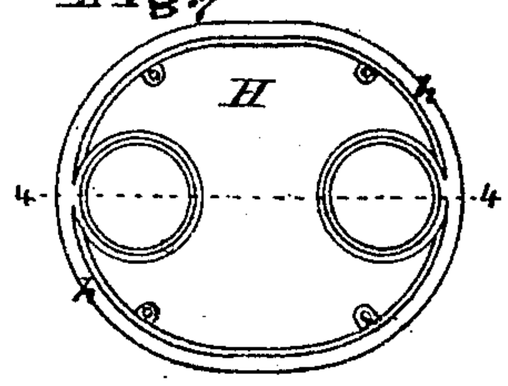
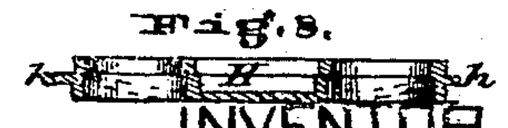


Fig. 8.



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Jas. L. Ewin
Walter Allen

INVENTOR,
Jas. B. Eads
By Knight Bros Attys

123,002

UNITED STATES PATENT OFFICE.

JAMES B. EADS, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN CONSTRUCTION OF SUBAQUEOUS FOUNDATIONS.

Specification forming part of Letters Patent No. 123,002, dated January 23, 1872.

Specification describing certain Improvements in the Mode of Constructing Subaqueous Foundations, invented by JAMES B. EADS, of the city and county of St. Louis and State of Missouri.

My invention relates to the manner of constructing the air-locks and shafts used in sinking piers by the "plenum-pneumatic" process. My improvement consists in making the said air-locks, shafts, and all of their attachments removable, together with the water and air pipes, &c., to subserve the purpose of economy, the apparatus being available for subsequent use.

Figure 1 is a vertical section of the shaft and air-lock, showing their details of construction. Fig. 2 shows the caisson, one-half in elevation and the other half in longitudinal section through the shaft and air-lock. Fig. 3 is a bottom view of one-half of the caisson, and a top view of the same at the lower course of cross-timbers. Fig. 4 is a cross-section of the caisson at the lines 1 1 and 2 2, Fig. 3. Fig. 5 is a longitudinal section through the side girder. Fig. 6 is a horizontal section at the line 3 3, Fig. 1, looking upward. Fig. 7 is a plan of a double air-lock plate. Fig. 8 is a longitudinal section at the line 4 4, Fig. 7.

A is the cylindrical portion of the air-lock, having a recessed door, B, whose exterior falls within the exterior surface of the lock, so as to present no impediment to the upward removal of the lock. C is a circular concavo-convex casting forming the bottom of the air-lock, and having an upturned edge, *c*, to which the shell A is riveted. D is the head of the lock, being riveted to the shell A. E is the upper door of the air-lock, opening downwardly, so that it, like the door B, will be closed by the pressure of the air in the caisson. F is an annular upward extension of the head, to which the shaft G is connected by a water-tight joint, *g*. The part F of the head is firmly secured, by means of bolts *f*, in a collar-plate, H, a shoulder, f^2, all around resting upon the top of the collar, and a frusto-conical surface, f^3, resting in a suitably-formed part of the collar. This joint is made tight to prevent the escape of air from the air-chamber I. The caisson may be circular, square, or of any other desirable form or size. The preferred form of the collar H is shown in Fig. 6, the collar being oblong in plan, and fitting an aperture, K, of similar form in the top of the caisson; a flange, *h*, extending beneath the top of the air-chamber, and being secured thereto by bolts h^2. h^3 are rubber or other gaskets to render the joints impervious to air or water under pressure, and yet allow the easy separation of the parts when required. The aperture K, being oblong, and the shaft and lock circular, leaves an open space upon each side of the shaft to receive the upper ends L of the pipes of the air and sand pumps, the said pipes screwing into the collar H, so as to be removable by unscrewing therefrom. L^2 are the lower ends of these pipes, screwed into the lower side of the collar H. M is an eyebolt in the lower side of the collar in the line of its greatest diameter; and N is a similar eye on the bottom of the air-lock, the eyes being connected by a chain, shown by dotted lines *o* in Fig. 1, to enable the collar to be drawn up with the lock when the latter is removed.

The object of this construction is to permit the removal of the shaft, air-lock, &c., from the caisson when the excavation is completed and the caisson is ready prepared to receive its filling of sand.

To accomplish this removal the chain O may be first attached to the eyes M and N. The pipes L^2 may then be unscrewed from the bottom of the collar. The bolts h^2 are then taken out, the pressure of air in the chamber being sufficient to hold the collar in place. The men then pass through the air-lock and remove the bolts *f* after the pressure of air has been sufficiently reduced in the air-chamber or the water admitted to the same. The pipes L may be unscrewed from the collar H and the latter allowed to fall to the bottom of the air-chamber. The buoyancy of the air-lock and shaft will much assist in their removal. As the shaft and air-lock are carried upward the collar will be drawn up endwise, its breadth being in the plane of the largest diameter of the aperture K, through which it will thus readily pass, its smaller diameter being less than the larger diameter of the aperture.

In Figs. 7 and 8 is shown a modification in which an oblong plate is made of sufficient size to receive two air-locks and shafts.

Claims.

I claim—

1. The removable shaft G, air-lock A B C D E, and collar H *h*, substantially as and for the purposes set forth.

2. Also, in combination therewith, the non-circular aperture K.

In testimony of which invention I have hereunto set my hand.

JAS. B. EADS.

Witnesses:
SAML. KNIGHT,
GEO. C. FABIAN.