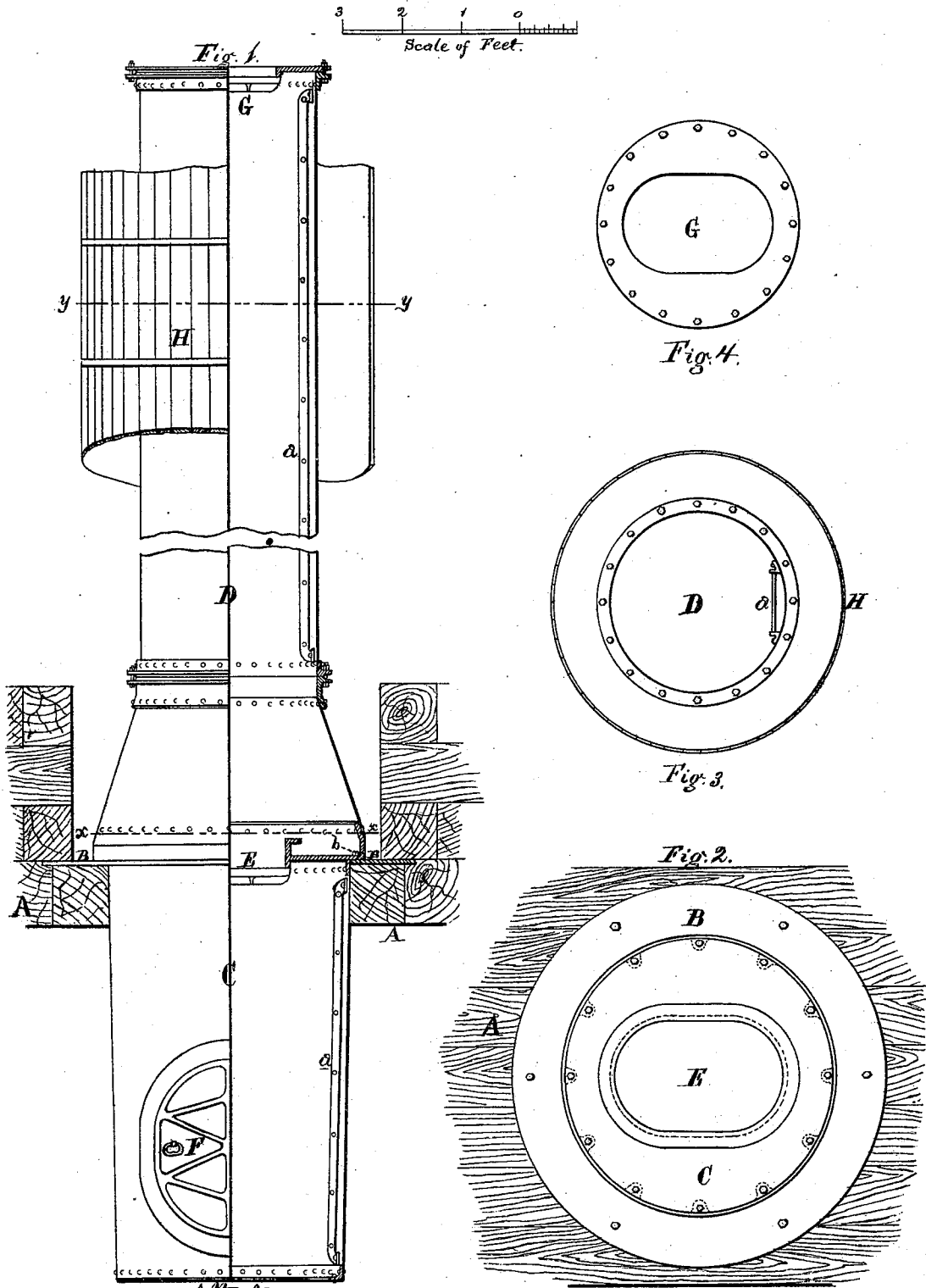


W. S. POPE.

AIR-SHAFT FOR PNEUMATIC CAISSONS.

No. 170,588.

Patented Nov. 30, 1875.



Attest:
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UNITED STATES PATENT OFFICE.

WILLARD S. POPE, OF DETROIT, MICHIGAN.

IMPROVEMENT IN AIR-SHAFTS FOR PNEUMATIC CAISSONS.

Specification forming part of Letters Patent No. **170,588**, dated November 30, 1875; application filed November 19, 1873.

To all whom it may concern:

Be it known that I, WILLARD S. POPE, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Air-Locks and Air-Shafts used in Caissons for Sinking Piers by the Pneumatic Process, of which the following is a specification:

Heretofore the sinking of bridge-piers and their supporting-caissons by the pneumatic process has involved the abandonment and loss of the air-lock, and a part or the whole of the air-shaft used in maintaining the air-pressure within the caisson.

The object of my invention is to so arrange and attach the air-shaft and air-lock to the caisson that, after having subserved their purpose, they may be detached and withdrawn from the caisson and pier, and preserved for subsequent and similar use.

Figure 1 shows, half in elevation and half in vertical section, the air-lock and air-shaft partially surrounded by a portion of the enveloping-barrel. Fig. 2 is a cross-section of the air-lock, taken on the plane *xx* in Fig. 1, showing also in plan the independent bed-plate. Fig. 3 is a similar section of the air-shaft and its enveloping-barrel, taken on the line *yy* in Fig. 1. Fig. 4 is a plan of the top of the air-shaft and its man-hole and gate.

Like letters refer to like parts in the several figures.

In the drawing, A represents a portion of the deck of a caisson, in which is cut a circular opening for the insertion of the pendent end of the air-lock. B is an annular cast-iron bed-plate lying on the lower tier of deck-timbers about the opening. C is the air-lock, of iron or other material having the required strength to resist the pressure to which it may be subjected. It is made slightly tapering in vertical section, so that it may slip easily down through the opening in the bed-plate, its upper end being flanged to rest thereon. D is the air-shaft, which rests upon, and is connected to, the flange of the air-lock, being built up in sections, which are successively placed in position as the work proceeds, so that its top is always above water. E is the upper door of the air-lock, and F the

lower one. G is a door or gate to close the man-hole in the cap-plate of the air-shaft, when it is desired to use the latter as an air-lock. The air shaft and lock are provided with ladders *a a*, on which the workmen descend to the bottom of the air-lock, passing out of the lower door into the main air-chamber of the caisson. The flange of the air-lock is secured to the bed-plate by tap-bolts *b*, access to which is had from the interior of the air-shaft. H is a subsidiary tube or barrel, which may be built up of wooden staves or other material, to envelope the air-shaft, the purpose of which is to prevent spalls, chips, or dirt, or other material from dropping into the well of the pier, to so wedge or bind the air shaft and lock as to prevent or render difficult their being hoisted out.

After the purposes are accomplished for which the air-shaft and air-lock have been used, the tap-bolts *b* are unscrewed, when the entire mass may be readily hoisted out and preserved for subsequent similar use.

If the air-lock be placed at the top of the air-chamber, without involving a change of principle, a slightly-different arrangement of detail will be required. In this case a further use of the cap in the air-shaft with its man-hole and gate G is found, in this: that the air-lock proper can be lifted off to permit the insertion of additional sections of air-shaft as the pier sinks, without releasing the air-pressure from the main air-chamber.

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

1. The combination of the exterior enveloping tube or barrel H with the air shaft or lock, substantially as and for the purpose set forth.

2. The combination of an air shaft or lock, D, provided with a cap-plate having a man-hole and gate, G, with an exterior barrel, H, the several parts being constructed and arranged substantially as described and shown.

WILLARD S. POPE.

Witnesses:

CHAS. E. HUESTIS,
H. S. SPRAGUE.