2 Sheets--Sheet 1.

J. E. MILNER.

Submarine Sand-Elevators.

No. 147,780. Patented Feb. 24, 1874.

Fig 1.

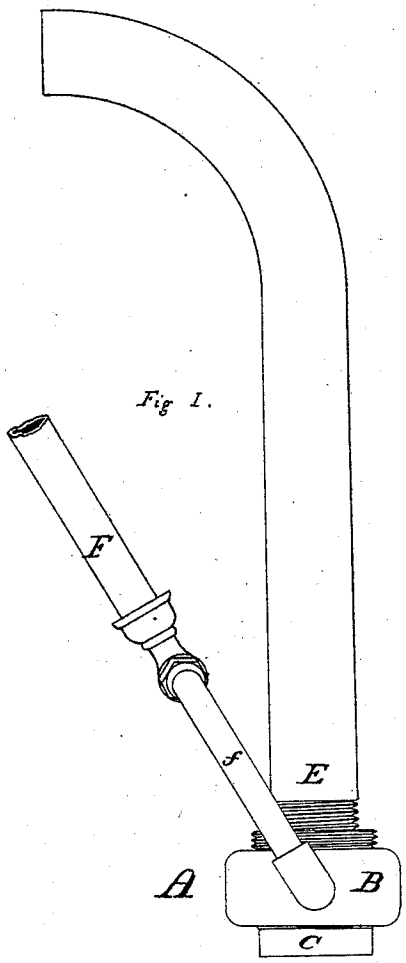
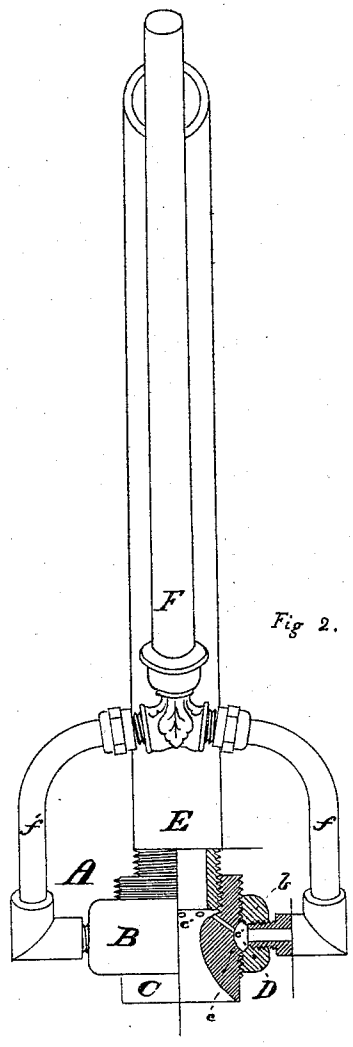


Fig 2.



WITNESSES

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Frank S. Boyd

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2 Sheets--Sheet 2.

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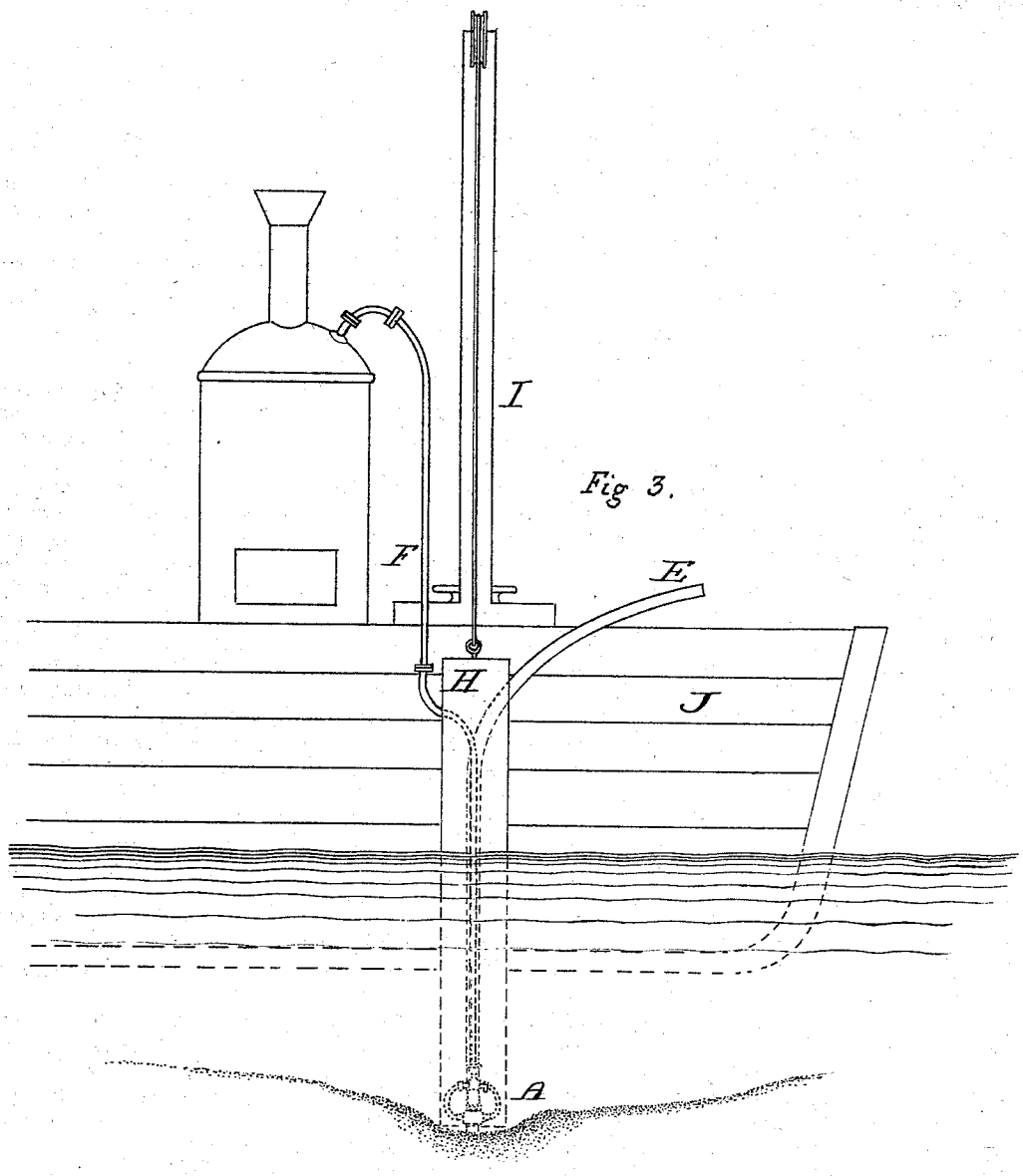

Fig 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN E. MILNER, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN SUBMARINE SAND-ELEVATORS.

Specification forming part of Letters Patent No. **147,780**, dated February 24, 1874; application filed October 28, 1873.

To all whom it may concern:

Be it known that I, JOHN E. MILNER, of the city and county of St. Louis, State of Missouri, have invented new and useful Improvements in Submarine Sand-Elevators, of which the following is a full, clear, and exact description, reference being had to the annexed drawing making part of this specification, in which—

Figure 1 is a side elevation of the elevator. Fig. 2 is a front elevation, part of the elevator being shown in section; and Fig. 3 is a view of the elevator in position.

Like letters indicate like parts.

The object of the present invention is to provide means whereby sand can be elevated from the beds of rivers rapidly and economically; and consists, chiefly, in the peculiar construction of the elevator, substantially as is hereinafter described. It also consists in the means employed in preventing the condensation of the steam used in the operation of the invention.

In the drawing, A, Figs. 1 and 2, represents the elevator. It consists of a ring, B, provided on its inside with a groove, *b*, extending around it. The ring B also, on its inside, above and below the position of the groove *b*, is threaded. Into the ring B a thimble, C, Figs. 1 and 2, is screwed. The thimble, on its outside, is suitably threaded, and also is provided with a depression or groove, *c*, extending around it. When in position the groove *c* of the thimble is opposite the groove *b* of the ring, forming an annular space, D, Fig. 2. Extending from this annular space to the inside of the thimble, and all around the thimble, are small passages *c' c'*, inclining upward. Immediately below the position of the perforations *c' c'*, the thimble, on its inside, contracts; but further down, below the level of the space D, the thimble enlarges, forming a flaring mouth to the bottom of the elevator. The thimble projects above and below the ring B. Into the upper end of the thimble a discharge-pipe, E, is screwed. Its upper portion, after leaving the thimble, is gradually curved, as shown in Fig. 1. F, Figs. 1, 2, and 3, represents a steam-supply pipe, extending from a steam-generator, G, to the ring B. Just before entering the ring the pipe F forks into two smaller pipes, *f f*, which connect with the space D at opposite sides thereof, as shown more distinctly in Fig. 2. H, Fig. 3, represents a casing inclosing the elevator, and also the steam-pipe F to a point above the water-line. It serves as a jacket, and also to support the elevator. Attached to the upper end of the casing is a rope, that passes up over a derrick, I, which rests upon the barge J. By this means the elevator can be raised or lowered.

In operation, the casing containing the elevator is lowered to the bottom of the river, the mouth of the thimble resting on the sand. Steam then being admitted to the space D, and thence through the passages *c c'*, &c., into the upper part of the thimble, an upward current of sand and water through the discharge-pipe to the deck of the barge is caused. As the sand is removed, forming a depression in the river bottom, the casing is allowed to sink down. It is found in practice, to secure an effectual working of the elevator at a depth of more than eight feet, that the following conditions must exist: The passages *c c'*, &c., must extend uniformly around the thimble, and the main steam-pipe must fork and connect at opposite sides of the elevator, this for the purpose of maintaining an even pressure and amount of steam all around the inside of the thimble, and in consequence a uniform action upon the sand and water below; secondly, the steam-pipe and elevator must be protected from the chilling influence of the water.

Having described my invention, what I claim as new therein is—

1. The elevator A, consisting of the ring B, constructed as described, the thimble C, constructed as described, the steam-pipe F, provided with the forks *f f*, and the discharge-pipe E, all arranged and operating substantially as shown and described.

2. In combination with the elevator A and steam-pipe F, the casing H, as and for the purpose specified.

JOHN E. MILNER.

Witnesses:
CHAS. D. MOODY,
DANL. T. POTTER.