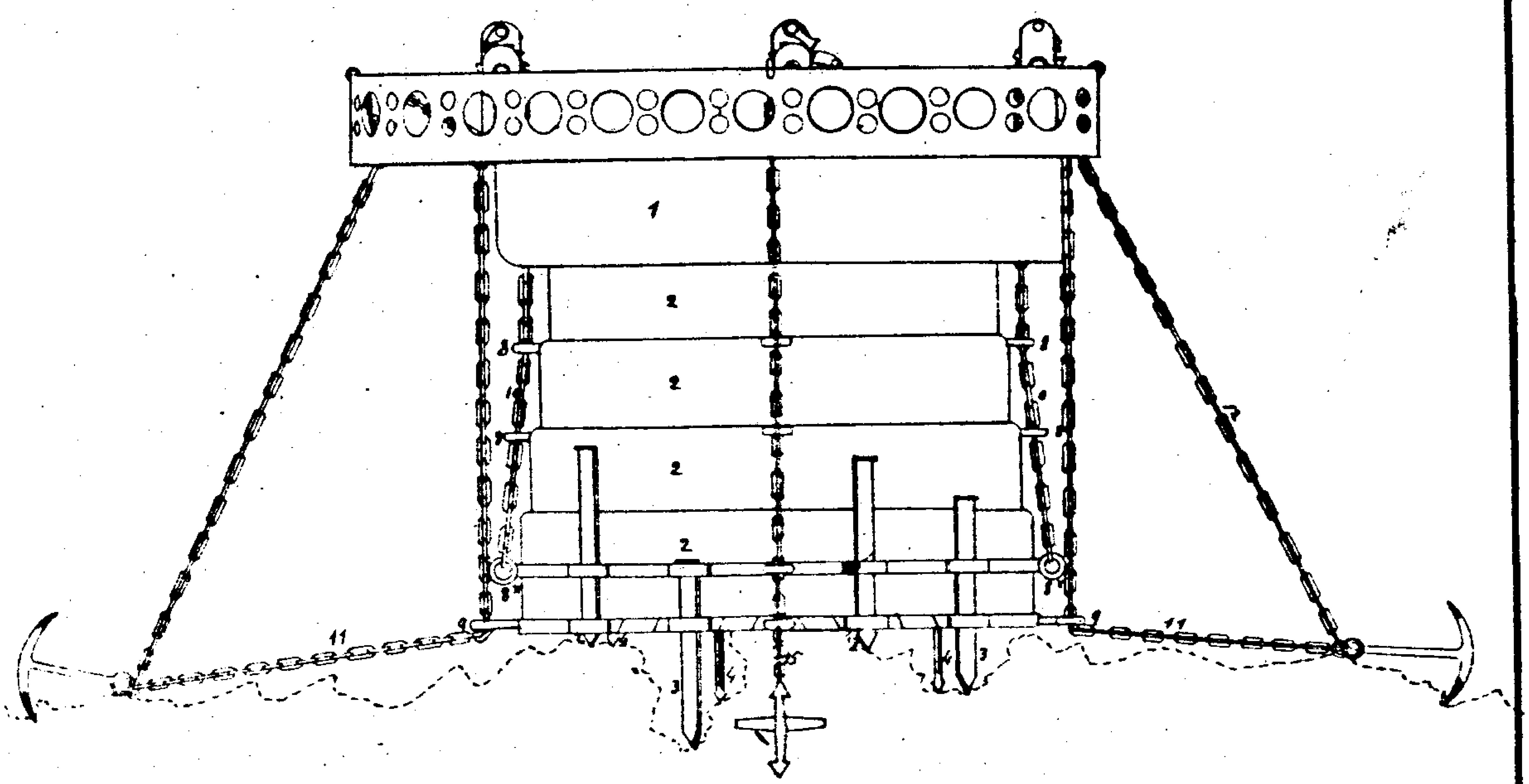
Sheet 1-2 Sheets

S. Lewis.

Still-Water Dam.

№ 80492 Patented July 28, 1868.

Fig 1.



WITNESSES.
James P Kenyon
C. Sparks

INVENTOR
Samuel Lewis

Sheet 2-4 Sheets

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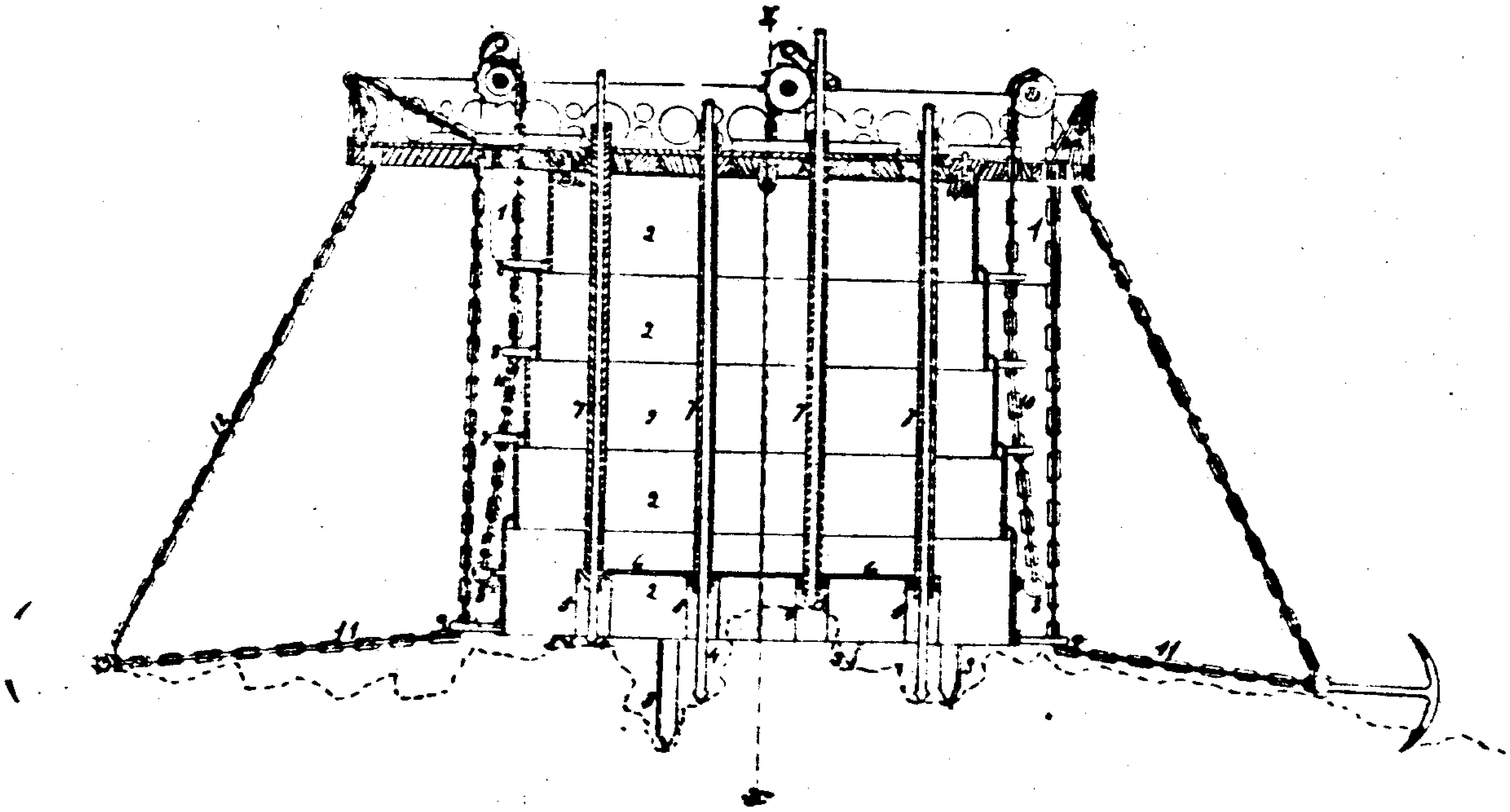
Still-Water Dam.

N° 80492

Patented July 28, 1868.

Fig 2.



WITNESSES.

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Sheet 3-4 Sheets

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Still-Water Dam.

No. 80492

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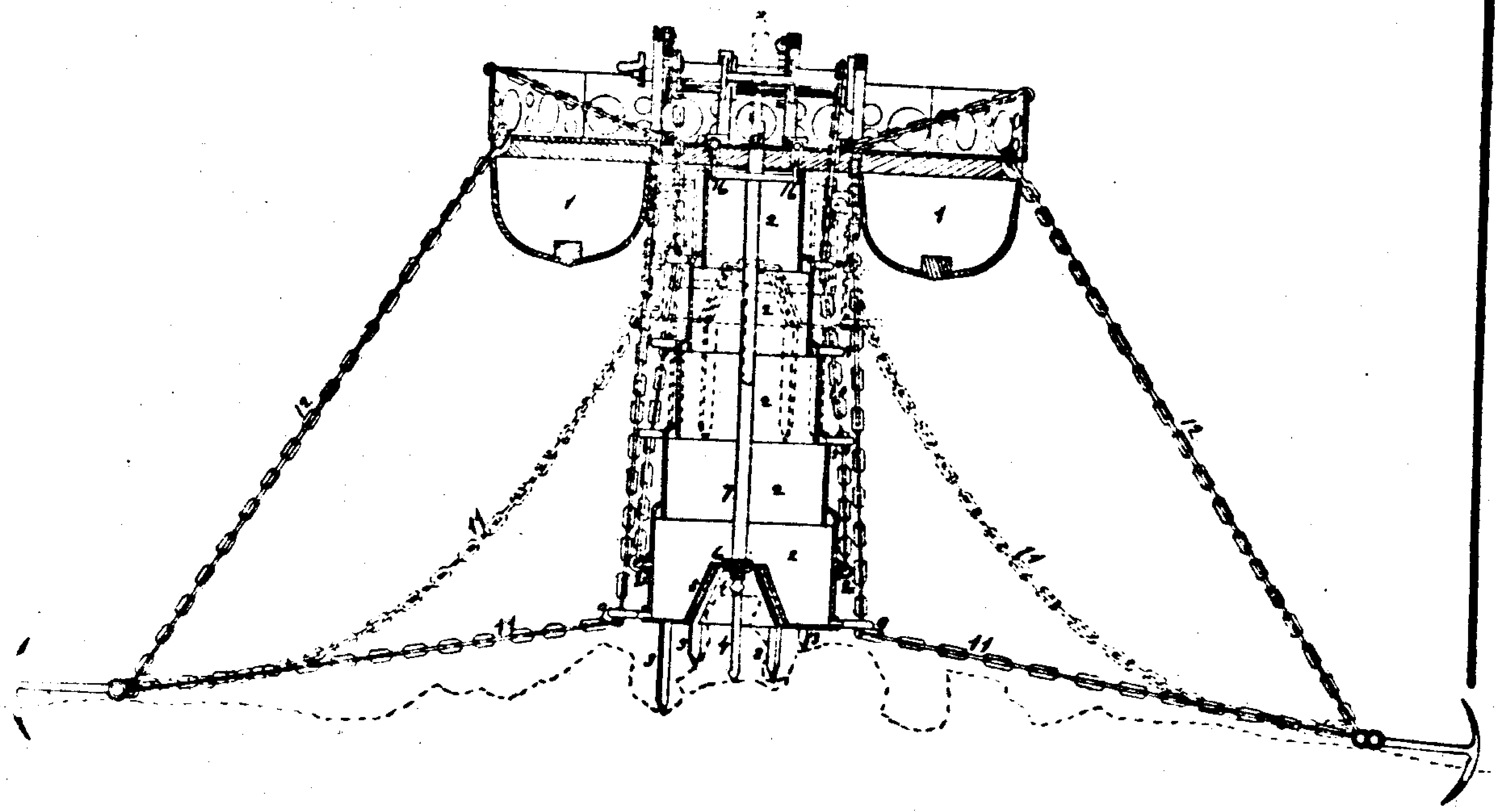
Fig. 3.



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Sheet 4-4 Sheets

S. Lewis.

Still-Water Dam.

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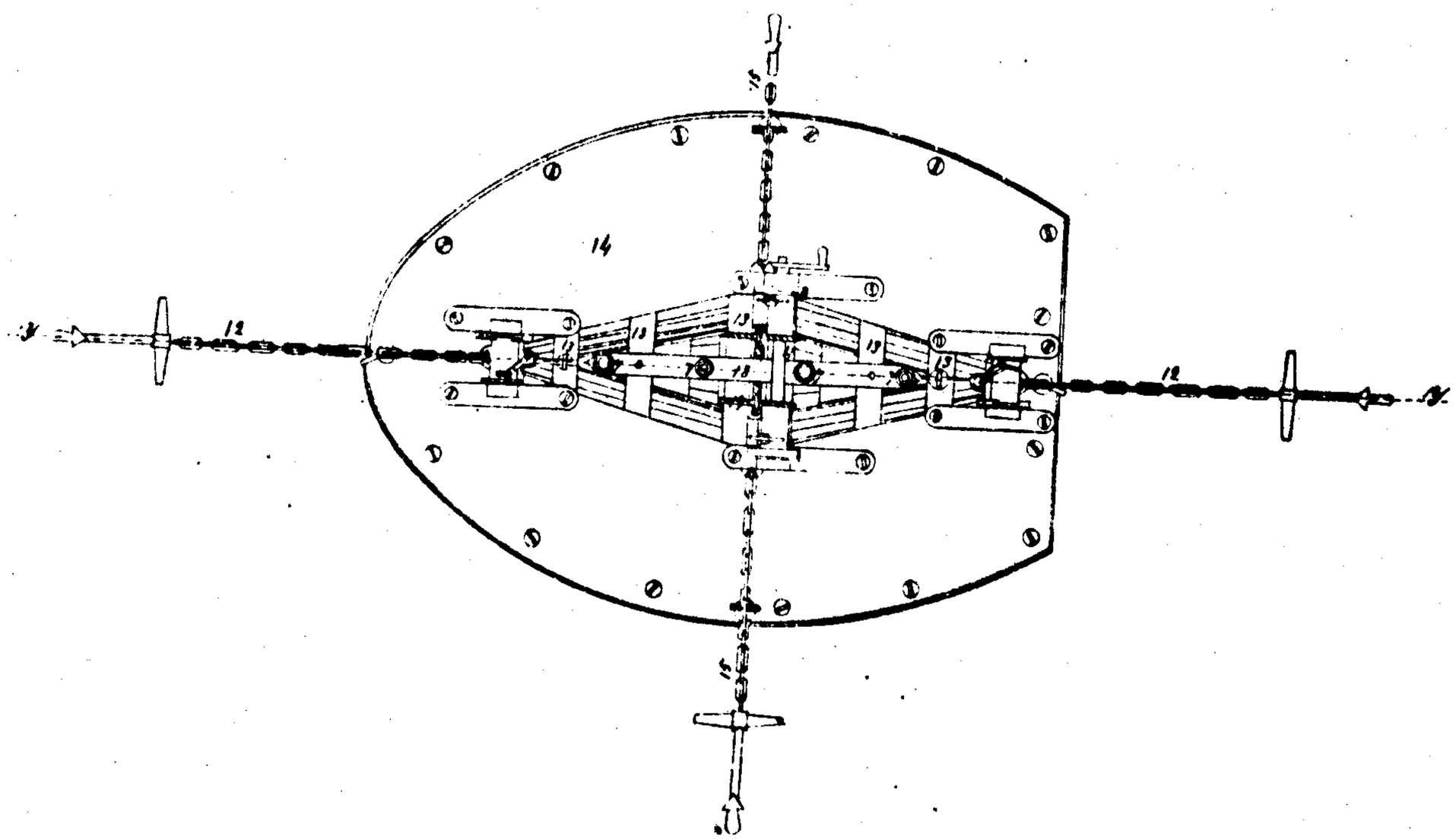
Fig. 4.



WITNESSES.

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INVENTOR

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United States Patent Office.

SAMUEL LEWIS, OF BROOKLYN, NEW YORK, ASSIGNOR TO WILLIAM H. CAMMEYER, OF SAME PLACE.

Letters Patent No. 80,492, *dated July* 28, 1868.

IMPROVED PORTABLE AND ADJUSTABLE STILL-WATER DAM.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, SAMUEL LEWIS, of Brooklyn, Kings county, New York, have invented a new and improved Portable and Adjustable Dam for the Purpose of Producing Still Water in which to operate for the blasting and removal of obstructions in rivers and other water-courses; and I do hereby declare that the annexed specification is a clear and exact description thereof, reference being had to the accompanying drawings, and the letters and figures of reference marked thereon.

It is a fact well known to practical men, that the work of blasting rocks under water is attended by many and great difficulties. Wherever such obstructions exist in a channel, they produce a throttling or contraction of the water-course, and a consequent acceleration of the current or tidal flow, that renders any operation with a view to their removal next to impossible, except during two or three hours in the twenty-four of each day. Taking, as an example, Hell-Gate, between the city of New York and Long Island, it has been found impracticable, owing to the intensity of the current, to work unintermittingly with any apparatus or process yet devised. On account of the nature of the bottom, a coffer-dam was out of the question; the drilling by hand from the surface is equally impracticable, owing to the depth of the water and the difficulty already named; while the surface-blasting of Maillefert was simply a criminal waste of explosives, which spent their force mainly upon the yielding water surrounding and overlying the blast or charge.

Thus, in the absence of means to remove these subaqueous obstructions, some of our most important water-thoroughfares are either partially or entirely closed to the commerce of the world, and vessels of light draught and small consequence to trade are the only users of channels which, with but little addition to the work of nature, might be converted into highways for the most magnificent vessels and the most precious freights that float, at once increasing the inducements by extending the facilities of commercial intercourse.

In view of this most important desideratum, the present applicant has devised the apparatus herewith submitted, the main object of which he would premise to be the enabling of workmen (when necessary) to continue their operations during the entire day and night, without any reference to the strength or state of the tide, or the varying depth of the water, and, by using a number of drills simultaneously, to increase the amount of execution almost indefinitely.

These results can be accomplished, it is believed, by the mechanism accompanying these presents, and illustrated in the drawings attached, in which—

Figure 1 is a side elevation or view of the apparatus in its working position, showing the methods of anchoring, &c.

Figure 2 is a longitudinal vertical section in the line of // //, fig. 4, or along the fore-and-aft central line of the dam, showing the telescopic sections thereof, the position and direction of the drills, and the devices for sheathing or shortening the dam.

Figure 3 is a vertical transverse section in the line *x x*, fig. 2, showing the manner of guiding and bracing the drills and drill-tubes, the manner of suspending the dam from the main deck, the side anchorage, and, in the red lines, the appearance of the dam when sheathed or closed for shallow drilling or removal.

Figure 4 is a top or plan view, showing the form of the dam in its horizontal section, the positions of the drills, the windlasses for varying the depth of the dam and for operating the anchors, and the general appearance and furnishing of the deck, as far as this application is concerned.

The manner of constructing this dam is as follows:

Two boats, 1 1, are prepared, (double-enders, as shown,) on one or each of which is an engine of requisite power, with propeller and machinery complete for moving the boat, raising the anchors, varying the depth of

the dam, and operating the drills. These boats or hulls are then connected by a substantial deck, the beams and floor of which are seen at 13 14, fig. 2.

This deck has an opening in its centre equal to the horizontal area of the dam, as shown in fig. 4, for the purposes of access and light to the diver, &c. From this deck is suspended the telescopic or sectional portion of the apparatus, 2 2 2, with its chains and attachments all previously adjusted and ready to be drawn through their respective openings in the deck.

The manner of constructing the telescopic portion last mentioned is to prepare a series of plates, of galvanized iron or any other proper material, of suitable thickness, and bend and fasten them into the form shown in fig. 4, so as to offer the least resistance to the tide or current, thereby easing the work of the anchors and contributing to the control of the apparatus generally. Each division of the dam is bent inwards at its upper edge, and at its lower outer edge has a strip fastened, so as to prevent the sections from separating. Each section is likewise provided with four eyes or eye-bolts, 8 8 8 8, one at each side and one at each end, which serve as guides to the several sections while opening or closing, the lower eye-bolts of this series, 8× 8× 8× 8×, being attached permanently to the chains 10 10, through which the dam is operated.

It is contemplated, likewise, to attach friction-rollers to each section in certain cases, to obviate any serious amount of friction in the shortening or extension of the dam, but these have not been deemed of sufficient importance to be shown, as they would only be needed where plates of insufficient thickness had been used, or where the external pressure was extraordinary.

The lower section is provided with four framed wheels or eye-bolts, 9 9 9 9, the former being preferable, for the anchor-chains, 11 11, to pass through. These chains are shown hooked on to the railing, but the intention is to have them, in practice, operated by windlasses similar to those shown for operating the dam.

The applicant does not desire to bind himself to the use of one anchor from each end and side, as shown, as circumstances may arise rendering it necessary to attach an anchor directly and exclusively to the guard of the boat, and another to the bottom of the dam, thereby duplicating the number of anchors shown.

The drills 4 4 work in tubes 7 7 7 7, the tubes being provided at their lower ends with threads, which screw into the lower longitudinal brace 6, while the extreme threaded end of the tube receives a nut under the transverse braces.

The upper ends of said tubes play freely in the guide-plate 18, so as to enable them to slide up and down, and adapt themselves to the depth of the dam. A full-length tube, however, is not deemed essential, as a section, of sufficient height above the braces 5 to prevent the drill from being entirely withdrawn therefrom during a stroke, is, for some reasons, to be preferred. Thus, if the stroke of the drill be twelve inches, a length of tube of fifteen inches, set with a rocking-joint in the lower brace, would be all that is essential to guide the drill.

The self-anchors, 3 3 3 3, are bars of iron, formed and moving in sockets, as shown, and, by virtue of their length and free play, adapt themselves to the irregularities of the bottom, and take a rigid and steady hold, which is highly necessary for the purposes of drilling. It is intended, in practice, to connect these self-anchors with the deck, so as to be able to take them out of operation and out of the way, whenever it may be desirable, by a cord, a wire, or a chain.

The telescopic apparatus, thus prepared, is then suspended from the deck by the four links and bolts, 16 and 17, the several chains are drawn through their respective openings and attached to their proper windlasses, and then, as far as regards this application, the dam is ready for work.

The operation of the apparatus will be as follows:

The boats, dam, and all appurtenances and connections being complete, with the sliding sections closed, as shown by the red lines in fig. 3, the machine is taken to the spot on which it is intended to begin work. Arriving there, an anchor is let go, and its cable paid out to the full length, the boat moving till the chain is taut and the anchor takes hold, when the other end anchor is dropped, and the two chains taken up till the floating structure is held steadily by the two anchors. The side anchors are next launched from a lighter or attendant boat. When these anchors are all placed, it will be desirable to send down the diver to explore the bottom and report any advisable change of position. If he reports that the self-anchors will have a better hold, and the drills a better face to work upon by a movement in any direction, one cable is let out and another taken up till the desired movement, fore and aft or lateral, has been effected, when the dam is lowered to its work, the self-anchors taking hold of the bottom, something after the manner shown, rendering any movement of the dam very improbable, especially when assisted by the co-operative hold of the outside anchors. The drills (operated in any appropriate manner) are then adjusted and started, and the work has fairly commenced.

When the drills have penetrated to the desired depth they are withdrawn, the diver goes down and inserts the charges, the apparatus is moved a little out of the way by a proper manipulation of the cables, and the blast is fired from the deck. The machine is then replaced in its first position, the diver again going down to examine the execution of the blast, and to indicate the position for the next drilling, and so on, until the bottom has been blasted out and the channel is clear of obstructions.

During the drilling, of course the tide will be rising or falling, which will render necessary occasional changes in the length of the cables and adjustment of the drills, to which attention will be given by a man detailed for that special duty.

Having thus fully described my still-water dam for the removal of subaqueous obstructions, what I claim as new, and desire to secure by Letters Patent, is—

1. The construction and arrangement of a portable and adjustable dam in sliding or telescopic sections, in the manner and for the purposes herein described.

2. The combination of the self-anchors 3 with the dam, in the manner and for the purposes herein described.

3. The combination of the boats, supports, or floats with the dam, as above described, and the arrangement of anchors to hold such boats in position, in the manner and for the purposes described.

4. The combination and arrangement of windlasses, chains, and boats with the dam, as above described, so that by the construction thereof a series of drills may be operated within and enclosed by the dam, in the manner and for the purposes herein described.

The above specification of my invention signed by me, this day of July, 1868.

SAMUEL LEWIS.

Witnesses:

C. A. SPARKS,

J. P. KENYON.