2 Sheets—Sheet 1.

D. TUFTS.

Dams.

No. 213,957. Patented April 1, 1879.

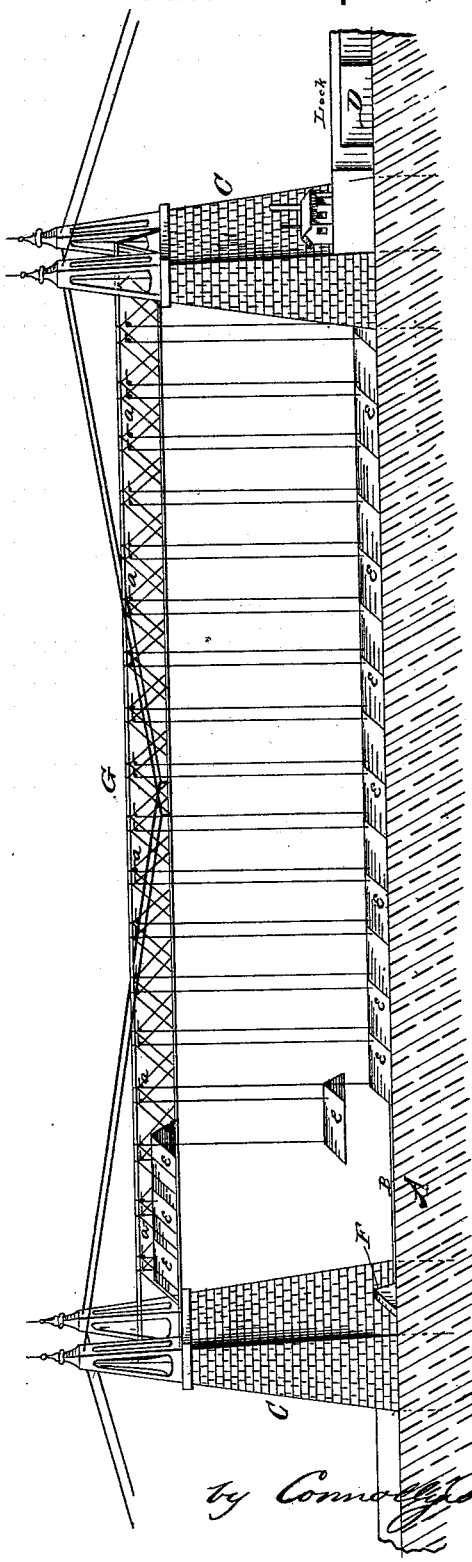

Fig. 1.

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2 Sheets—Sheet 2.

D. TUFTS.

Dams.

No. 213,957. Patented April 1, 1879.

Fig. 2.

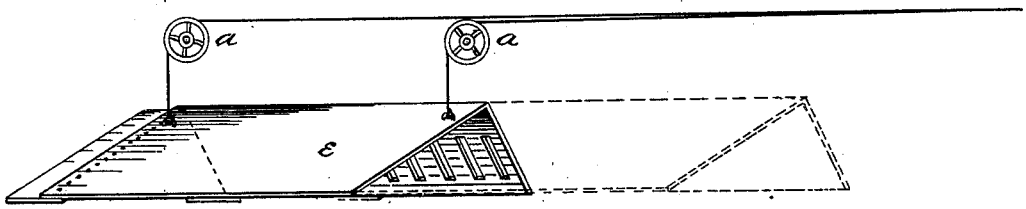


Fig. 3.

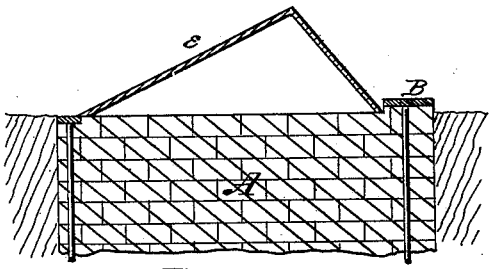


Fig. 4

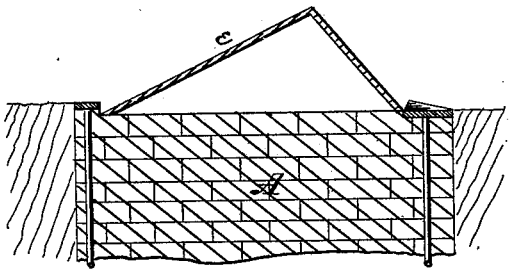


Fig. 5.

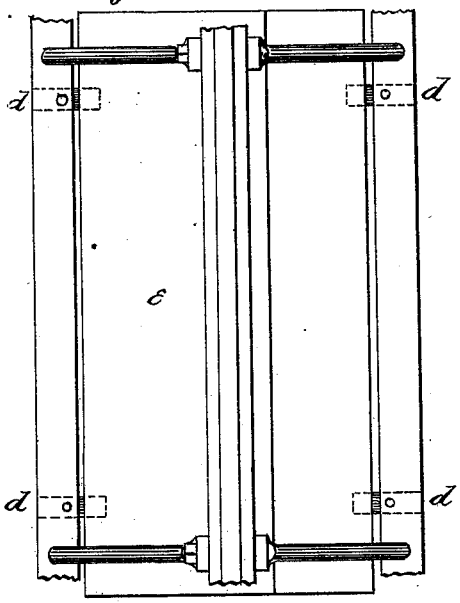
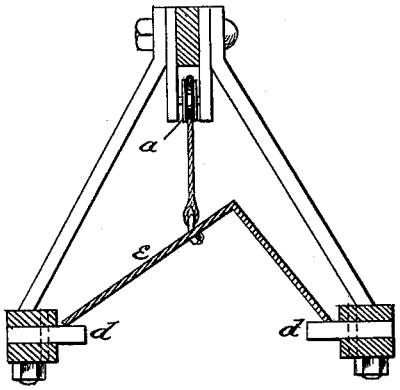


Fig. 6.



Witnesses.

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G. Smith.

David Tufts, Inventor

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UNITED STATES PATENT OFFICE.

DAVID TUFTS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN DAMS.

Specification forming part of Letters Patent No. **213,957**, dated April 1, 1879; application filed December 18, 1878.

To all whom it may concern:

Be it known that I, DAVID TUFTS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Dams; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is an elevation of my invention as applied to a river, looking down stream. Fig. 2 is a detail; Figs. 3 and 4, sections of foundation and dam, showing two forms for the latter. Figs. 5 and 6 are, respectively, plan and section of the bridge structure, with one section of the dam elevated and secured.

This invention relates to the construction of dams, movable or stationary, for rivers, &c.; and consists in the construction, arrangement, and combination of parts, substantially as hereinafter fully described and claimed.

Dams, as at present constructed, are of two kinds, movable and stationary. Stationary dams are generally built up solid from a foundation, and it is unnecessary to describe them. Movable dams are of different varieties. Suitable foundations are built in the stream-bed, and the dam is made to slide vertically in them, or to close down against the bottom of the stream, or to collapse downwardly out of the way, or to draw together into groups, leaving openings for craft to pass through.

Serious objections arise against all of these. First, more or less difficulty is experienced in handling objects in the water against the strong current of a rising stage of water, which necessitates the removal of the dam. In the case of those which clear the way by dropping, sliding, or collapsing downwardly, boatmen can never be sure of a clear channel, because of the possibility of a section not reaching its proper seat, nor secure against the same projecting like a snag and striking and sinking the boat. Besides it is difficult to so strongly moor the parts as to secure them against being hurled from their fastenings by the tremendous floods of the seasons of rain and thaw and the floating débris which accompanies them. Similar troubles beset the existence of other varieties of movable dams.

The great all-comprising objection to every variety of dam at present known is, that in every case, though ostensibly placed out of the way of craft, the dam, or its movable parts, still remain in or under the water, and are liable to be swept away or so displaced by the current as to bring destruction upon passing boats.

I make a radical change, and at once sweep away all these objections by my invention, which consists, broadly, in constructing the dam in movable sections, and elevating them entirely out of the way of the water and out of the reach of passing boats by means of an elevated bridge structure.

To these ends my invention is as follows: A designates the foundation built in the river-bed, having its surface level, and at its lower edge a ledge or stop, B. This foundation A is built solid and massive, and preferably across the entire available channel of the stream, leaving room at one or both ends for suitable piers C and a lock, D. The dam E is constructed by lowering to foundation A sections *e*, of wrought-iron, of about the form shown, their ends fitted to overlap each other, also as shown. The lower edges of these sections rest against the ledge B, which serves to anchor them against the current, while their triangular form prevents their being overturned, since both the hydrostatic pressure and momentum of the current act upon the top of the sections, and thus stability is secured.

The piers may be provided with a triangular extension or projection, F, on which the two extreme sections rest, and serve to more securely anchor the others. The sections may be braced internally as strongly as desired; but as that relates to the mechanical details of building I need not enlarge upon it.

A bridge structure, G, spans the space between the piers. This is preferably of open-work, as shown, and triangular in cross-section, (see Fig. 6,) and it is desirable to provide a foot-path on each side. In a suitable space above the apex of the triangle, but at relatively different heights, are arranged a series of sheaves, *a*, there being two for each of

the sections *e* of the dam. Ropes or chains are connected, as shown, to the sections, pass up over sheaves *a*, and thence run doubly, or after splicing singly, along to a sheave-drum at one pier, which is operated by a suitable engine in such manner that one or more sections may be elevated at a time. In this way when high water is heralded a few hours will suffice to remove the entire dam from the bed of the river, and to elevate it and place it securely on the bridge above the reach of the chimneys or masts of vessels, where it remains until low water requires it to be lowered, and this without unduly straining the superstructure, because the sections of dam can, by bracing, be made of comparatively light material—wrought-iron or other metal.

To remove the strain from the ropes or chains, I construct swiveled stops *d*, Fig. 6, on the stringers of the bridge, so arranged that they can be swung in under the sections after they have reached their highest elevation, when by lowering a few inches they come to rest on the stops, and relieve the ropes of all weight.

The special dam may be applied in building ordinary stationary dams, canal-overflows, &c. I therefore place no limitation upon its application either as a movable or as a stationary structure.

The lower face of the dam, it should be observed, is preferably formed with openings or slots to allow the water to pass through, and obviate any tendency of the same to raise or otherwise displace the sections.

What I claim is—

1. A dam having a suitable foundation and a breast formed of one or more metal sections of triangular shape, resting upon a foundation and anchored by gravity-pressure and a ledge on said foundation.

2. A dam consisting of a foundation, A, having ledge B, and a breast made up of two or more triangular-shaped overlapping sections, *e*, substantially as described.

3. The combination of the foundation A, its ledge B, triangular sections *e*, and corresponding projections F on the end abutments.

4. The combination of the foundation, the movable dam-sections, and a superstructure spanning the dam and supplied with means of elevating and lowering any or all of the sections, substantially as described.

5. The combination of the movable dam-sections of triangular shape, the open-work superstructure spanning the dam, and supplied with means of elevating the sections and supporting them when elevated, substantially as described.

6. The combination of sections *e*, their elevating ropes or chains, the superstructure spanning the dam and having sheaves over which said ropes or chains pass, and a suitable motor at the end of the same, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of December, 1878.

DAVID TUFTS.

Witnesses:

R. WATSON,

ROBT. LIDDELL.