G. SWIFT & W. T. O'NEALE.

METHOD OF FORMING EMBANKMENTS.

No. 181,372. Patented Aug. 22, 1876.

Fig. 1.

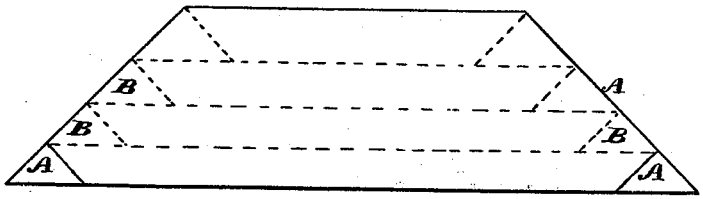
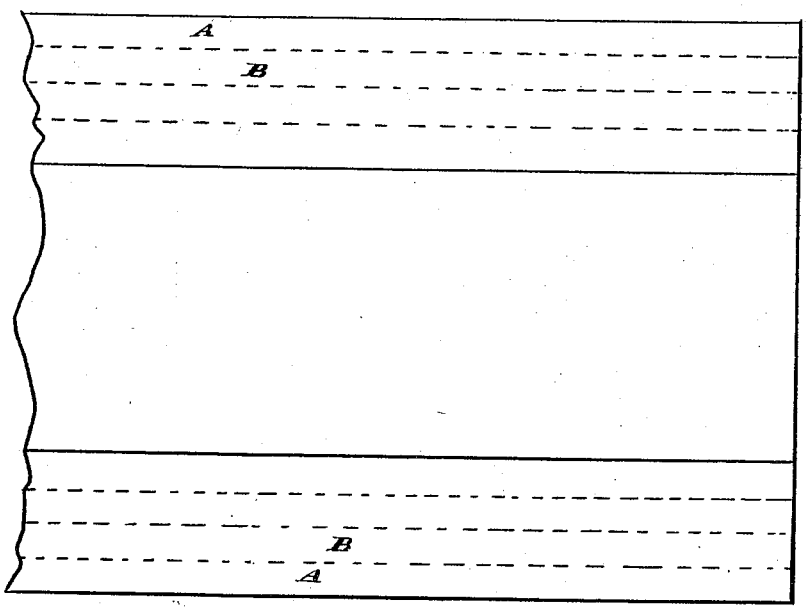


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE SWIFT AND WILLIAM T. O'NEALE, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN METHODS OF FORMING EMBANKMENTS.

Specification forming part of Letters Patent No. **181,372**, dated August 22, 1876; application filed July 28, 1876.

To all whom it may concern:

Be it known that we, GEORGE SWIFT and WM. T. O'NEALE, of the city and county of San Francisco, and State of California, have invented a Method for Forming Embankments or Levees; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

Our invention relates to a novel method of forming embankments and levees, which will be more fully described by referring to the accompanying drawings, in which—

Figure 1 is a transverse section of our embankment. Fig. 2 is a plan.

Our system consists of first throwing up by hand-labor two small embankments or levees, of any length or height, to be constructed as shown in the accompanying drawing, marked A A, at the outer and inner sides of the contemplated levee. These two small embankments or levees form the two sides of a canal or channel, which may be of any height or depth which experience may prove desirable in each particular case. This canal or channel may be closed at either end, if desired, and, if closed, we call it a "trough." We now use machinery of any description—such as pumps, vacuum, dredging, the "extracteur bazin," or any other machinery—for pumping and extracting mud, sand, gravel, or sedimentary deposits, which we discharge into our canal, channel, or trough, where, whatever the nature of the earthy matter contained, it will be deposited in more or less time, and clear water is allowed to flow off through suitable gates, until such time as we have partially or totally filled the space contained between our two embankments or levees A A.

When the space between A A is partially or totally filled, we raise the outside embankment or levee, as shown at B B, and continue the operation, and repeat as many times as necessary, until the embankment has attained the desired height.

Should the nature of the soil or the passage of some difficult point not permit the formation of the first small levees or embankments, we use planks to the requisite height, or boxes, floated into position or constructed on the spot, to form the portion, or the whole length, as required, and then follow the same system of pumping and depositing the sediment, as already described. These planks may be secured by posts and girders, and, in some exceptional cases, piles and sheet-piling may be necessary; but the same system is always employed to form the bank—that is to say, discharging between the outside walls or banks the mud, sand, gravel, or earthy material, mixed with water, allowing the sediment to subside, and drawing or allowing the water to flow off.

Should said mud, sand, or sedimentary deposit, used for the construction of such levee or embankment be insufficient to withstand the action of the tide or flow of water, we propose to protect the same by the use of lumber, or by thatching with tule, or straw, or sod, or any other material that may prove suitable to obtain the result sought, placed on the outer side of said levee or embankment.

Should lumber be used, and it be found necessary, we propose to girt the same with stringers, reaching from the inner to the outer side of said levee or embankment, not confining ourselves to any particular mode, method, or auxiliary for accomplishing the desired result.

Having thus fully described the nature of our invention, and the best modes with which we are acquainted of carrying the same into practice, we do not confine ourselves to the precise details of construction shown in the accompanying drawings, as they may be varied without departing from the principle of the invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The method of forming levees or embankments, the same consisting in constructing low embankments or timber retaining-walls, successively above each other, for the formation of canals, channels, or troughs, and filling said channels by any suitable means with sand, gravel, or other sedimentary deposit, mixed with water, which is drawn off after the sediment has been deposited, thus forming a concrete embankment, substantially as herein described.

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