(No Model.) 2 Sheets—Sheet 1.

R. H. F. & N. H. SEWALL.

DIKE.

No. 534,919. Patented Feb. 26, 1895.

Fig. 1.

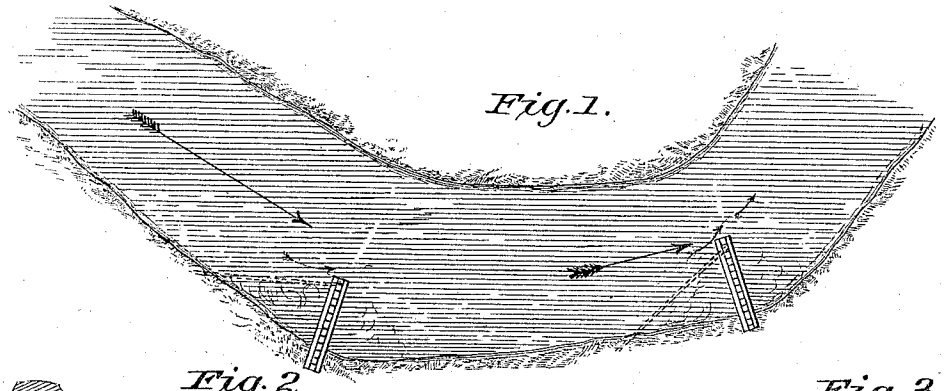


Fig. 2.

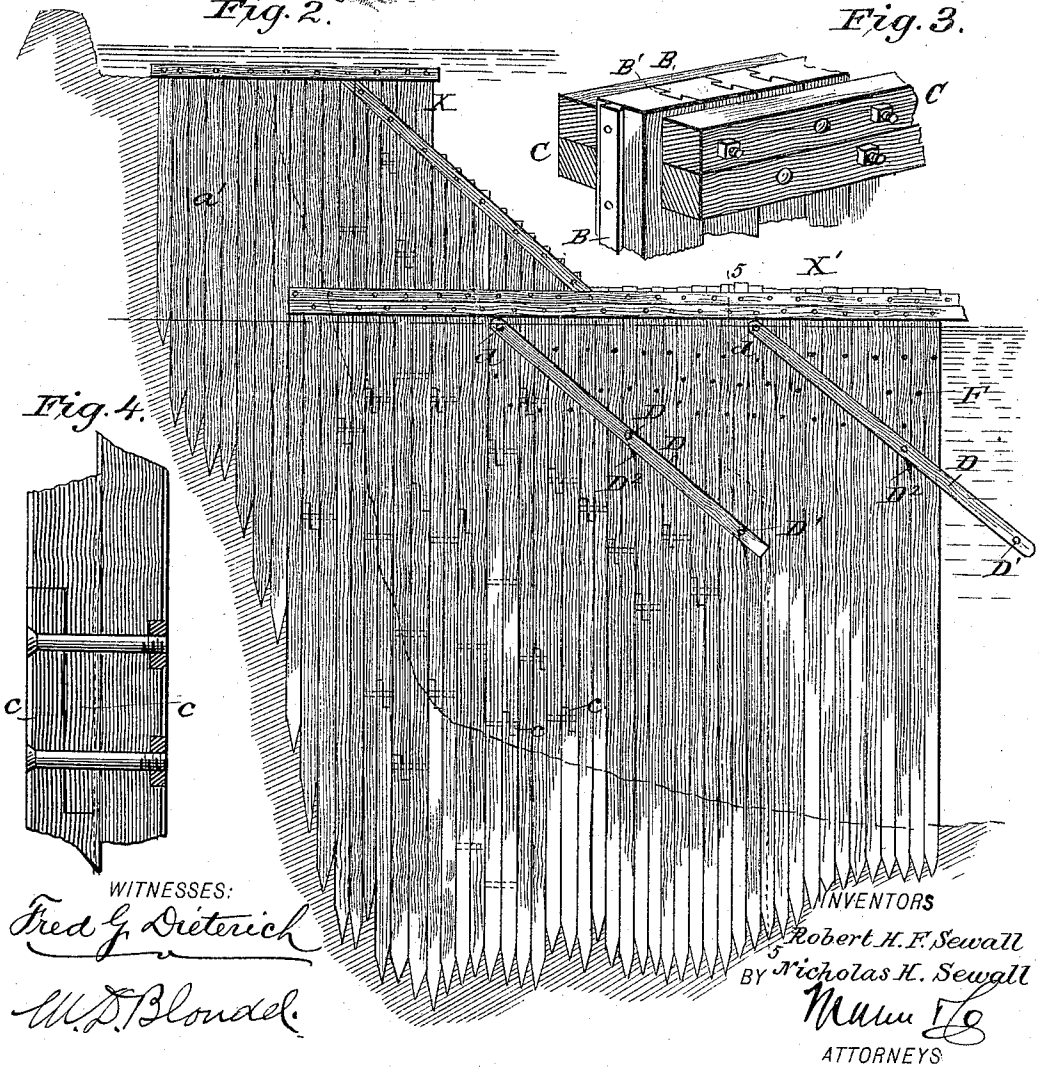


Fig. 3.

Fig. 4.

WITNESSES:

Fred G. Dieterich

W. D. Blondel.

INVENTORS

Robert H. F. Sewall

Nicholas H. Sewall

BY Munn & Co

ATTORNEYS

(No Model.) 2 Sheets—Sheet 2.

R. H. F. & N. H. SEWALL.

DIKE.

No. 534,919. Patented Feb. 26, 1895.

Fig. 5.

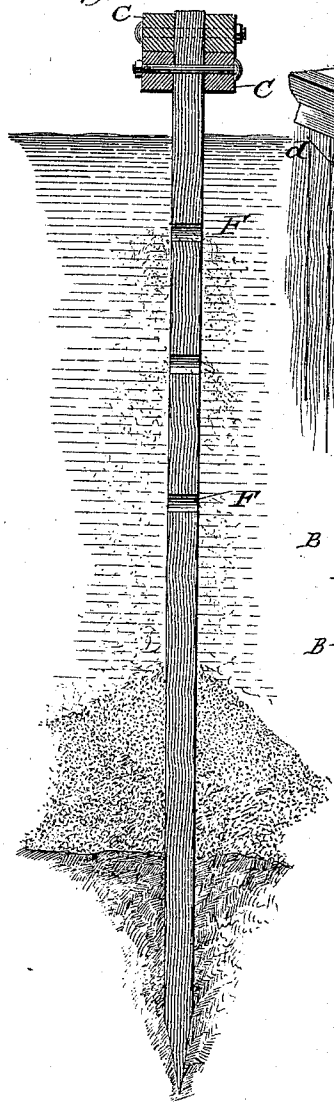


Fig. 6.

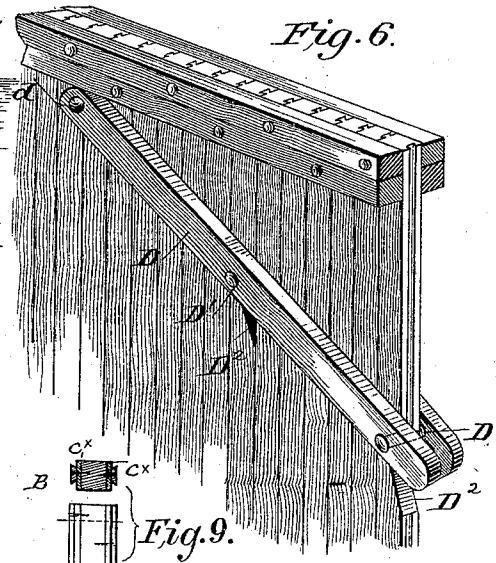


Fig. 6ª

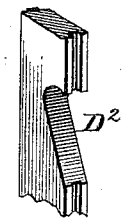


Fig. 9.

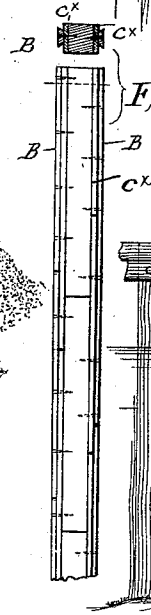


Fig. 7.

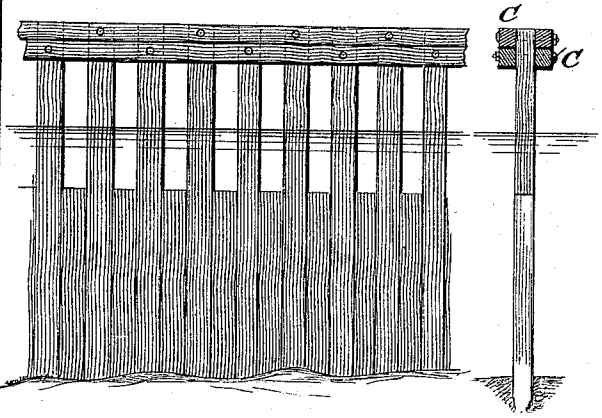
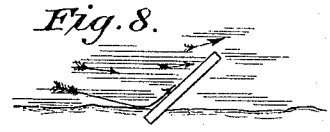


Fig. 8.



WITNESSES:

Fred G. Dieterich

W. D. Blondell

INVENTORS

Robert H. F. Sewall

Nicholas H. Sewall

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT H. F. SEWALL, OF NEW ORLEANS, LOUISIANA, AND NICHOLAS H. SEWALL, OF BESSEMER, ALABAMA.

DIKE.

SPECIFICATION forming part of Letters Patent No. 534,919, dated February 26, 1895.

Application filed May 31, 1894. Serial No. 513,103. (No model.)

To all whom it may concern:

Be it known that we, ROBERT H. F. SEWALL, of New Orleans, Orleans parish, State of Louisiana, and NICHOLAS H. SEWALL, of Bessemer, in the county of Jefferson and State of Alabama, have invented a new and Improved Dike, of which the following is a specification.

Our invention relates to improvements in that class of dikes, known as spur or wing dikes, and it has for its object to provide a dike of this character which will possess the required stability to withstand at all times the current pressure, which will effectively serve to deflect the current in the direction desired and which can be economically and quickly constructed.

A further object of our invention is to provide a dike of such construction and disposed relatively to the direction of the current, in such a manner that the river bed at the base of the dike cannot be washed away, or the dike undermined.

With other minor objects in view, which will hereinafter be referred to, our invention consists in the peculiar arrangement, and construction of a dike, such as will be first described in detail and then particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a diagrammatic view of a portion of a river, showing the manner in which our improved dikes are set, relatively to the direction of the current. Fig. 2 is a side elevation of one of our improved dikes. Fig. 3 is a detail perspective view of a portion of the upper end of the dike, illustrating the manner of bracing the upper ends of the piles. Fig. 4 is a detail view illustrating one way of splicing the piles. Fig. 5 is a cross section of the dike on line 5—5 Fig. 2. Figs. 6 and 6ª are detail perspective views hereinafter more particularly referred to. Fig. 7 is a side view of a modified arrangement of the piles, and Fig. 8 is a diagram view hereinafter referred to. Fig. 9 illustrates in detail a modified construction of a settional pile.

Heretofore, so far as we know, spur or wing dikes have been arranged to project on an obtuse angle, that is, in the direction of the current, whereby to avoid receiving the full impact force of such current, while deflecting it inward. In such arrangement of dike it has been found in use, that the current will engage such dikes practically in the direction indicated by arrows in Fig. 8 of the drawings, which not alone continuously washes away, to a measure, the bank at the inner end of such dike, but also washes out the earth at the front and base of the dike until it undermines the same, and thereby soon removes its base support, which renders it (the dike) useless. To overcome this very objectionable feature, we have found that by projecting the dike slightly at an acute angle to the direction of the current, it forms not only a check for the current, to deflect it as desired, but also produces an eddy in front of and to the rear of the dike, which serves to change the channel or swift water path to a point outside the end of the dike, as indicated by the arrows in Fig. 1. By thus forming an eddy or still water body at each side of the dike, the lateral pressure on the dike is substantially equalized, and reduced to the minimum, and as the current is deflected to the outer edge of such dike, the bottom or base will not be washed away, and the dike undermined, but to the contrary, such base will be constantly increased in area as the mud and silt in such eddies will deposit at each side of the dike, and thereby maintain at all times, a compact and solid foundation for such dike.

Referring now more particularly to Figs. 2, 3, 4 and 5 of the drawings it will be noticed our improved dike is constructed of a series of piles joined together and braced to form a solid and compact body. At this point we desire to state that, when used in shallow streams, the piles may be all formed of a single length, but when used in very deep streams we form each pile double and spliced together, as shown.

The detailed construction of our dike is best explained as follows: At the point where it is desired to build a dike, piles are driven into the ground on shore as shown at a', and such piles are joined by dovetailed tongue and groove connections B B′ as most clearly shown in Fig. 3, and after a number of the piles have been successively joined and driven home, their upper ends are securely braced by the horizontal beams C C, which are bolted

to the said upper ends as shown. In case the bottom of the river is of a depth greater than the ordinary length of pile, a long pile is first formed, by joining two sets of piles, by splicing, which is preferably done in the manner most clearly shown at *c c* in Fig. 4.

It will be noticed by reference to Fig. 2 that the dike is made of stepped portions, *i. e.*, the portion X which is disposed above the low water line extends a short distance out, and has its front edge inclined downward as at X′, while the main or body portion projects up just above the low water level and is extended out into the stream any desired distance. As an additional strengthening means diagonal braces D are employed for the main or body portions, which braces are secured at their upper ends by bolts *d* to the piles. As shown in Fig. 5 such braces are arranged in pairs to straddle the piles, and to provide for securing such braces to such piles at points below the water line, the braces have cross bolts D′ at suitable intervals, and to hold the braces in place their ends in practice are weighted, which keeps them down, and as the angle at which they are held is known, at points where the cross bolts D′ are, the piles at such points are cut out to form a notched way D^2 which, when the pile is driven home registers with the cross bolt D′ and forms a seat therefor in which it is held by the next pile driven in place.

In practice the distance between the bolts D′ is sufficient to allow of a springing of the bar between such points, when pulled upward, which can be done by attaching a rope to the end of the bar and pulling it upward by a suitably arranged wrench provided for such purpose, which is loosened when the lower end of the last notched pile passes the bolt D′. This allows the bolt to be pressed tightly against the notched pile by the spring of the brace whereby when the notch reaches the bolt, such bolt will spring into the notch.

As the greatest amount of silt and mud deposit occurs at the front of the dike, and as it is desirable that the deposit on each side should be nearly alike, we form the dike piles with a series of apertures or openings F, through which some of the water passes and as such water passes through from the eddy in front, it follows, that as it enters the rear eddy a large amount of the silt and mud which passes through the openings F, will deposit at the rear of the dike. See Fig. 5. Instead of providing holes in the piles as shown in Fig. 5, it is mainifest that water ways may be formed by driving each alternate pile lower, at a point below the low water line, as shown in Fig. 7. This allows for a mud deposit at the rear, and also relieves the dike from considerable lateral strain.

It is also manifest that by our improved system, a mud sill can be easily constructed across streams, by driving the center piles down to near the bed of the river.

From the foregoing it will be readily seen that we provide a simple but effective dike, which can be built without interfering with the current, and as it is gradually formed from the shore inward, it follows, that it cannot be weakened by the current. Furthermore by projecting it substantially at an upstream angle, the danger of its being washed away by undermining is entirely avoided, and by forming it of piles spliced, and braced as shown, it can be adapted for use in any stream where wing or spur dikes may be required.

It is obvious that our improved construction of dike can be also used for closing crevasses and the like, and if desired the dikes may have anchor braces extended to the shore, as indicated in dotted lines in Fig. 1.

In Fig. 9 we have shown a modified construction of a spliced pile, such comprising a series of single pile members placed end to end, which are secured together by the side timbers $c^\times$ $c^\times$ to which are fitted the dovetail and grooved strips B, which timbers and strips are nailed to the pile as shown.

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

1. An improved dike formed of piles joined at the edges and braced to form a solid mass disposed or projected into the stream, whereby to form an eddy at each side, said dike having portions at its upper end below the water line left free for the passage of water, substantially as shown and for the purposes specified.

2. An improved dike formed of a series of piles, the upper ends of the innermost piles being extended upward, and joined with the lowermost section by an inclined or stepped portion, and horizontal braces connecting the upper ends of the upper and lower sections of the piles substantially as and for the purpose shown and described.

3. As an improvement in bank protecting dikes, a dike formed of a series of piles joined at their edges and braced to form a solid mass, and projected into the stream to form eddies at each side, the body of such dike having water ways or apertures to admit of the passage of mixed water and silt or mud, from one eddy to the other all substantially as and for the purposes described.

4. An improved dike formed of a series of piles joined to form a solid mass, and having transverse apertures or water ways near its upper end substantially as and for the purpose shown and described.

5. As an improvement in dikes, in combination with the piles, of brace bars extended diagonally downward below the water line, and pivotally connected at their upper ends to the piles, said brace bars held to straddle the piles, and provided at intervals with transverse bolts, and the tie piles having notches adapted to receive the said transverse bolts when they register with such bolts, all substantially as shown and for the purposes described.

6. An improved spur dike, consisting of a series of piles held closely together to form a solid body, horizontal brace bars secured to the upper ends thereof, diagonal brace bars pivotally connected at their upper ends to the piles, provided with transverse pins, and notched portions in the piles adapted to receive the said pins all substantially as shown and for the purposes described.

7. As an improvement in the construction of dikes, dams, and the like, a pile formed of a plurality of members bolted together, each member formed of sections spliced together, all substantially as and for the purposes described.

R. H. F. SEWALL.
N. H. SEWALL.

Witnesses to signature of R. H. F. Sewall:
JOHN J. RYAN,
P. T. NICHOLSON.
Witnesses for N. H. Sewall:
H. E. KIRK,
M. J. MCADORY.