J. W. MOSHER.

LEVEE.

APPLICATION FILED MAR. 12, 1913.

1,073,278. **Patented Sept. 16, 1913.**

2 SHEETS—SHEET 1.

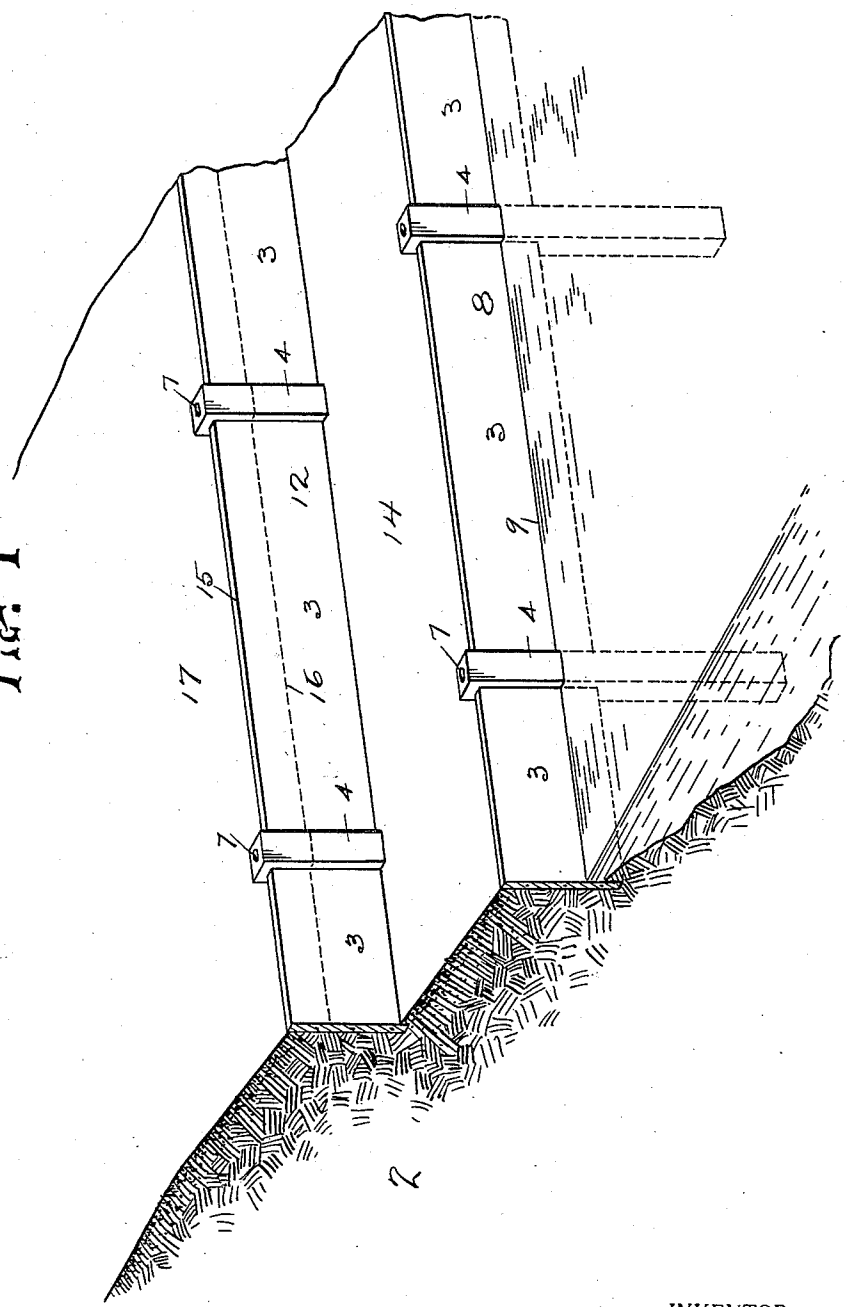


FIG. 1

WITNESSES:

J. B. Gardner

H. G. Prout.

INVENTOR.

JAMES W. MOSHER

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2 SHEETS—SHEET 2.

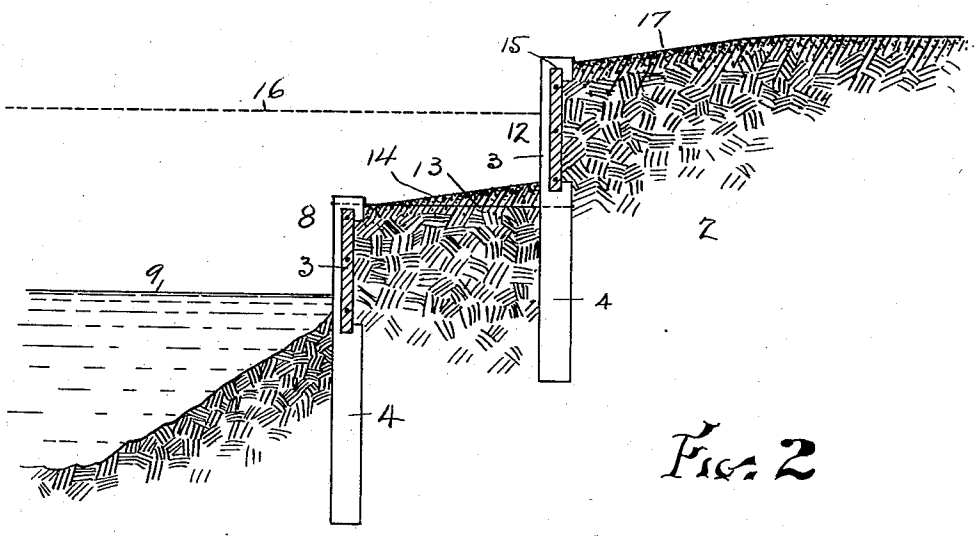


FIG. 2

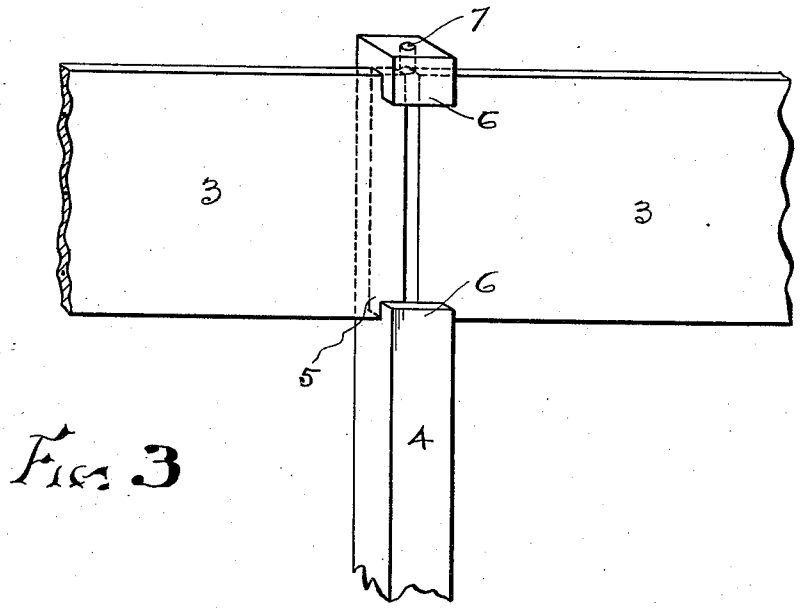


FIG. 3

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UNITED STATES PATENT OFFICE.

JAMES W. MOSHER, OF BERKELEY, CALIFORNIA.

LEVEE.

1,073,278. Specification of Letters Patent. Patented Sept. 16, 1913.

Application filed March 12, 1913. Serial No. 753,737.

To all whom it may concern:

Be it known that I, JAMES W. MOSHER, a citizen of the United States, and a resident of Berkeley, county of Alameda, and State of California, have invented certain new and useful Improvements in Levees, of which the following is a specification.

The invention relates to improvements in levees.

The object of the invention is to provide a levee which will withstand the action of the water.

Another object of the invention is to provide a levee having an impervious surface.

The invention possesses other advantageous features, which, with the foregoing, will be set forth at length in the following description where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. The novelty of the invention will be included in the claims succeeding said description. From this it will be apparent that I do not limit myself to the showing made by said drawings and description, as I may adopt many variations within the scope of my invention as expressed in said claims.

Referring to said drawings: Figure 1 is a perspective view of the water side of a portion of a levee constructed in accordance with my invention. Fig. 2 is a cross-section of part of a levee of my invention. Fig. 3 is a detail in perspective showing the preferred means of supporting the concrete facing.

Levees are usually constructed along rivers and other water courses to prevent the water from overflowing and inundating the surrounding country when the water in the river or water course rises above the level of its banks. The action of the water has a very deleterious effect upon levees as they are generally constructed, forming pockets therein, which at critical periods of high water often cause the destruction of the levee with the usual disastrous results. This erosion occurs in the made or filled portion of the levee, since the natural earth of the river banks is generally sufficiently impervious to prevent the erosive action. At periods of high water, when the speed of the current is increased, the erosive action is consequently increased, so that every year, during the dry season or season of low water, the levees must be repaired to correct the damage done during the flood or high water stages. This work must generally be carried on year after year, and the cost which falls upon the land owners and farmers is so great that it consumes almost all of the profits which have been reaped from the land.

In accordance with my invention, I construct the water side of the levee 2 in steps or terraces, of the proper height and number, depending upon the height of the levee and the inclination of its face. The vertical or upright portions of the steps or terraces are preferably formed of substantially permanent, erosion resisting material, such as concrete, which is preferably formed in slabs 3 and secured in place. These slabs are made of any desirable size and may be reinforced with metal when necessary or desirable. The slabs 3 are generally held in position by posts 4, preferably formed of concrete, which are driven or set into the bank or levee. The posts are provided with a seat or depression 5, partly closed by the overhanging lips or projections 6, for the receipt of the adjacent ends of two successive slabs. The ends of the slabs are spaced apart slightly from each other at the posts, so that each slab may have a slight movement independent of the adjacent slabs. The post 4 is generally provided with an opening 7 at the top extending into the depression 5, and after the slabs are in place, a quantity of material such as hot liquid asphalt is poured into the opening 7. This material flows into the space between the ends of the slabs and seals the joint, and on account of its plastic nature when cold, still allows a limited movement of one slab with respect to the others. The lowermost row 8 of slabs is placed so that the lower edge thereof lies below the low water level 9, or below the level of the fill of the levee. The second row 12 of slabs is similarly held in position, and is arranged behind and above the first row 8, the lower edge of the slabs in the upper row being usually placed above the upper edge of the slabs in the lower row. The posts of the two rows are usually tied or fastened together by rods or wires 13, to increase the strength of the structure. The area between the two rows of slabs is filled with earth or rock, the upper surface 14 thereof extending at a slope from the upper edge of the lower slabs to a plane slightly above the lower edge of the upper

row. This surface is composed of gravel, rock or other material, and is impregnated and treated with a suitable binder, such as heavy road oils, after which the surface is packed and rolled, so that an integral impervious surface is formed. This surface is not affected by the action of the water, and being impervious, the water cannot work its way thereunder and undermine the levee. The slope or inclination of the surface causes the rain water and the receding waters from the river to readily drain therefrom.

In the drawings I have shown a levee provided with two rows of concrete slabs, but it is evident that the invention is not limited to such particular construction. The upper row 12 of slabs is placed so that the upper edge 15 thereof lies above the flood stage or general high water level 16 of the river. The upper surface 17 of the levee is prepared in a similar manner to the surface 14, and slopes upward and backward a short distance from the top of the upper row of slabs. The top surface of the levee may be constructed to form a road in which instance the surface 17 will form the slope from the crown of the road to the edge. The upper surface 17 being impervious to water is not injured and the levee cannot be washed out, should the water in the water course rise to such a height that it would flow or pour over the levee.

I claim:

1. In a levee, a water side composed of steps, the flat portions thereof consisting of oil treated surfaces.

2. A levee comprising an earth fill, a concrete wall on the water side of said levee of less height than the height of the levee, and an inclined oil treated surface extending from the upper edge of said wall.

3. A levee comprising an earth fill, a concrete wall on the water side thereof of less height than the levee and extending below the surface of the water, and an inclined oil treated surface extending from the upper edge of said wall.

4. A levee comprising an earth fill, substantially vertical concrete walls arranged on the water side thereof, said walls being arranged successively behind and above each other, and an inclined oil treated surface extending from the top of one wall to a plane adjacent the bottom of the next wall.

5. In a levee, a plurality of concrete walls arranged on the water side thereof, said walls being arranged behind and above each other successively, said walls extending from a plane below the low water level to a plane above the high water level, and waterproofed surfaces extending from the top of one wall to a plane adjacent the lower edge of the next wall.

6. In a levee, a water side composed of steps, the vertical portions consisting of concrete walls and the flat portions consisting of oil treated surfaces.

7. In a levee, a plurality of posts arranged on the water side thereof, slabs of impervious material supported on said posts forming a substantially continuous wall, and an oil treated surface inclined upwardly from the upper edge of said wall.

8. In a levee, a plurality of posts spaced apart longitudinally on the water side thereof, said posts being provided with seats therein, slabs seated in said seats and extending from post to post, the adjacent ends of said slabs being spaced apart, and a filling of plastic material between said adjacent ends.

9. In a levee, a plurality of rows of posts arranged at different heights on the water side thereof, slabs extending from post to post in each row and supported thereby, forming a plurality of substantially continuous walls, and an oil treated surface arranged between said walls.

10. In a levee, a plurality of rows of posts arranged at different heights on the water side thereof, slabs extending from post to post in each row and supported thereby, forming a plurality of substantially continuous walls, and means connecting the posts in one row to the posts in the succeeding row.

11. In a levee, a water side comprising in combination vertical concrete walls spaced apart transversely of the levee and extending one above the other successively, and slightly inclined oil treated surfaces between said walls.

In testimony whereof, I hereunto set my hand at San Francisco, California, this 7th day of March 1913.

JAMES W. MOSHER.

In presence of—
H. G. Prost,
M. Le Conte.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."