(No Model.)

W. FLYNN.

CANTALEVER DIKE.

No. 548,251. Patented Oct. 22, 1895.

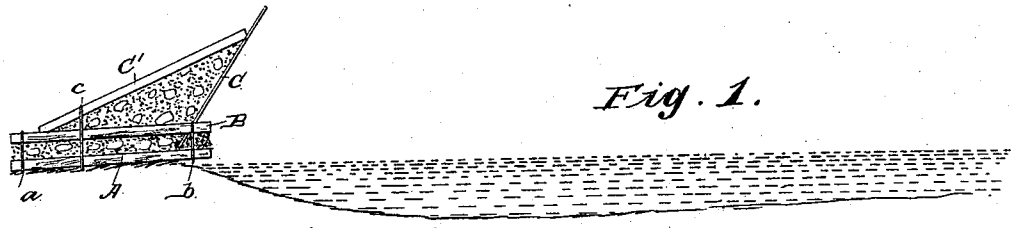

Fig. 1.

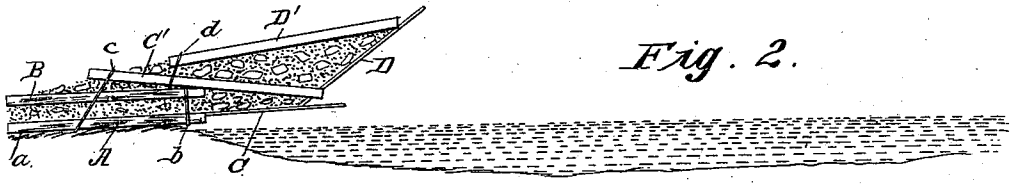

Fig. 2.

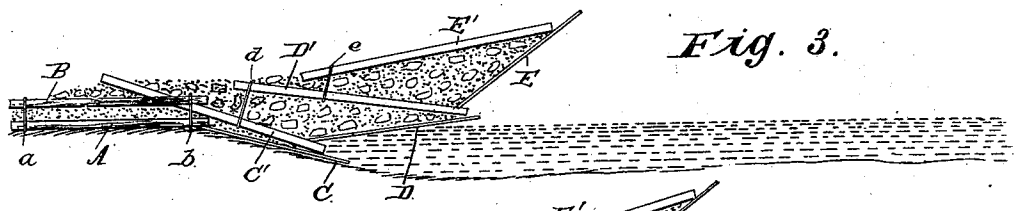

Fig. 3.

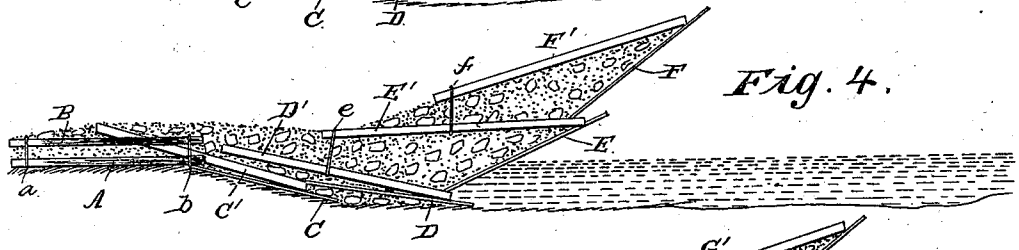

Fig. 4.

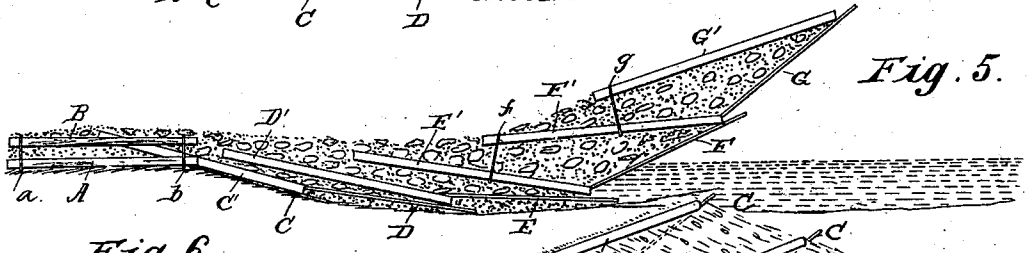

Fig. 5.

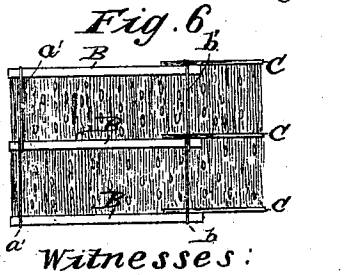

Fig. 6.

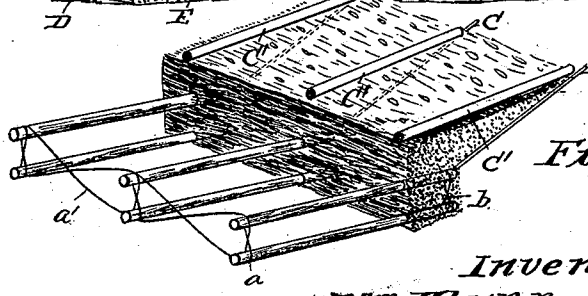

Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM FLYNN, OF SIOUX CITY, IOWA.

CANTALEVER-DIKE.

SPECIFICATION forming part of Letters Patent No. 548,251, dated October 22, 1895.

Application filed May 8, 1895. Serial No. 548,538. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FLYNN, of Sioux City, Woodbury county, Iowa, have invented certain new and useful Improvements in Cantalever-Dikes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to dikes, and more particularly to what I term the "cantalever" method of building dikes; and the object of the invention is a construction which can be projected from one or both banks into the swiftest and deepest streams at a comparatively small cost and which can be depended upon to deflect and confine the water to its proper course and therefore protect the banks of the stream from inundation.

With this object in view the invention consists in certain novel and peculiar features of construction and arrangements of parts, as will be hereinafter described and claimed

In order that the invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figures 1, 2, 3, 4, and 5 illustrate, progressively, successive steps necessary to be taken in order to produce a dike embodying my invention. Fig. 6 represents a plan view of anchoring end of the dike, and Fig. 7 illustrates more clearly the manner of building the dike.

In the said drawings, A represents a series of parallel timbers or tree-trunks which are arranged at suitable distances apart upon the bank which is being cut or washed away of the stream into which the dike is to extend and transversely to the direction of flow. The depth and swiftness of the stream will determine the number of timbers A employed, and consequently the width of the dike. A similar number of timbers B are arranged vertically and a suitable distance above the timbers A, and the space between each pair of timbers A B is preferably filled in with limbs of trees, brush, waste wood, rock, &c., so as to produce a strong and durable anchor or foundation. This anchor or foundation is preferably built in sand or other soft ground, so that it will gradually embed itself in the sand or soil, or, if desired, a trench to receive it may be dug. The object in view, however, is to produce, as above stated, a strong and secure anchor or foundation for the end of of the dike, and whether it be weighted sufficiently to embed itself to a certain extent in the bank or a slight trench be dug to receive it will probably depend upon circumstances, and the builder will be governed accordingly. Each pair of superimposed timbers A B are connected at their opposite ends, preferably, by wire cables or their equivalent, as shown at *a b*, and each set of said timbers A B may also, if desired, be connected by cables *a'* and *b'*, which may or may not form continuations of the cables *a* and *b*. Instead of building the brush, waste wood, &c., upon the timbers A and then placing the timbers B in place, the skeleton framework, comprising said timbers A and B and the connecting-cables, may be first placed in position, and then the brush, waste wood, &c., worked in between and weighted with rock, &c.

In building the dike it will be preferable to start it at a slight angle upstream, because the rush of the water then into the slight acute angle thus formed will tend to assist gravitation in embedding the lower timbers, of the dike into the bottom of the river. If built squarely across the river, gravitation alone would have to be depended upon against the resistance of the current in embedding the said timbers in the bottom of the river.

The foundation or anchor of the dike being now substantially completed and in place, I employ a number of stakes or levers C, the lower ends of which are thrust into the brush, waste wood, &c., at the end of the foundation or anchor, which preferably overhangs the stream slightly. Said levers or stakes C, which preferably correspond in number and are contiguous to the timbers B, (see Fig. 6,) are arranged to overhang the stream, and in the obtuse angle thus formed between said stakes and the timbers B is placed a filling of brush, waste wood, rock, &c., said brush, waste wood, &c., being preferably arranged transversely of the timbers B or parallel with the direction of flow of the stream, so that when once in place in the stream the ends of said waste wood, brush, &c., will be presented against the flow or current of the stream. As the said filling between the stakes or levers C and the timbers B accumulates the said stakes

or levers C are canted or depressed gradually at their unsupported or originally upper ends; but before sufficient weight of filling is placed thereon to depress said stakes or levers to a horizontal plane I secure thereon the ties or timbers C′, which originally formed the hypotenuse of the triangle thus formed. These timbers preferably correspond in number to and are at one side of the timbers B, and when first secured in position are connected by binders *c* near their ends which are farthest from the stakes or levers C with the foundation or anchor. By the time said ties or timbers C′ are thus secured the stakes or levers C, which have been gradually forced downward by the accumulating weight of the filling, will probably have assumed the position shown in Fig. 2 or approximately such position, and the timbers or ties C′ consequently will also assume the position shown in Fig. 2, the binder *c* assisting to prevent any further downward movement. I now employ a second series of stakes or levers D, and these have their lower ends thrust securely through the filling between the stakes or levers C and the timbers or ties C′, as shown in Fig. 2, and upon and within the obtuse angle formed by said stakes or levers B and timbers or ties C′ a second filling of the character above described is placed, and this second filling causes a still further depression of the free or unsupported ends of the stakes C and the timbers or ties C′. After sufficient filling is placed between the stakes or levers B and the timbers or ties C′, I place a second series of timbers or ties D′, which at their rear ends are tied, as shown at *d*, to the timbers or ties C′. The binders *c* are now severed to permit the front or unsupported ends of the levers or stakes C and the front ends of the timbers or ties C′, together with the interposed filling, to sink down to the bed of the stream, as shown in Fig. 3, and this downward movement of course causes the stakes or levers D and the timbers or ties D′ to assume the position shown in Fig. 3. I now arrange another series of stakes or levers E, as above described, with reference to the stakes or levers C and D, place a similar filling upon them and the timbers or ties D′, and arrange upon said filling the timbers or ties E′ and secure the same at their rear ends to the timbers or ties D′ by the binders *e*. The weight of the filling between the stakes or levers E, timbers or ties D′, and timbers or ties E′ causes the stakes or levers D and the timbers or ties D, after the binders *d* are severed, to sink to the bottom of the river, and the stakes or levers E, the timbers or ties E′, and the interposed filling to assume the position shown in Fig. 4. I now arrange another series of stakes or levers F, fill in the angle formed by said stakes or levers F and the timbers or ties E′, and arrange upon said filling the timbers or ties F′, and connect the rear ends of the same by binders *f* with the timbers or ties E′. This additional weight will cause the depression of the unsupported ends of the levers E, which, when the binders *e* are cut, will sink to the bed of the river, and the structure comprising the stakes or levers F, the timbers or ties F′, and the interposed filling will assume the position shown in Fig. 5. I then arrange, as before, another series of stakes or levers G, fill in the resultant angle, and place upon said filling the timbers or ties G′, and connect the rear ends of the same by the binders *g* with the timbers or ties F′. This additional weight causes the unsupported ends of the stakes or levers F to move downward, and when the binders *f′* are cut they will sink to the bottom of the river and the supported parts will be lowered in a corresponding degree. If by this time the bed of the river has been bridged a sufficient distance from the bank to permit the last structure, comprising the stakes or levers G and the timbers or ties G′ and the interposed filling, to settle firmly into position, I preferably sever the binders *g*. The dike thus constructed will now preferably be filled in with earth or any other suitable material.

I have described this dike as being constructed from one bank of a stream toward the opposite bank; but it is to be understood that I may construct it by building from both banks and terminating the structure at a suitable distance apart near the middle or any other point in the bed at which it is desired the stream shall flow. It is also obvious that the precise arrangement of parts as described and illustrated need not be followed out exactly—that is, I wish it to be distinctly understood that it is not absolutely essential that the timbers D, C, and C′, for instance, should correspond in number or be placed in the exact relation to each other as shown and described.

The essential feature or principle of the invention lies in securely anchoring one or both ends to start with, if the dike is to be started from one bank or both banks, and in then employing the cantalever principle by anchoring one end of the stakes or levers and leaving their opposite ends unsupported, and then in placing the filling of suitable material in such manner as to cause the gradual depression of said levers.

In practice it will be preferable to employ ties or timbers—such as C, D′, E′, &c.—of length about equal to the depth of the stream. In the accompanying drawings such ties or timbers are shown of length exceeding the depth of the stream, in order to more clearly illustrate the cantalever construction and action of the dike when in process of construction. It will be understood, of course, that the space at opposite sides of the dike, where at first eddies naturally form, will by the action of the stream soon be filled in to form an enlargement or extension of the bank.

From the above description it will be apparent that with my method of construction dikes can be built with comparative ease and

rapidity over the widest, deepest, and swiftest of streams, and can be relied upon after once being placed properly in position to confine the stream to its proper channel or course, and therefore protect the banks from inundation.

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

1. A method of building dikes, the same consisting, first, in planting an anchor or foundation in the bank of a stream, secondly, in planting stakes or levers in said foundation in such manner that they will cant or tilt under sufficient pressure, applied in the form of any suitable weighted filling, and thirdly, in securing said filling in position by means of ties or timbers, arranged substantially as set forth.

2. A method of building dikes, the same consisting, first, in planting an anchor or foundation in the bank of a stream, secondly, in planting stakes or levers in said foundation in such manner that they will cant or tilt under sufficient pressure, applied in the form of any suitable weighted filling, thirdly, in securing said filling in position by means of ties or timbers, fourthly, in planting a second series of stakes or levers at the front end of the stakes or levers first-mentioned, fifthly, in placing a suitable filling upon said last-mentioned stakes or levers and said timbers or ties, sixthly, in binding said filling to place by a second tie or timber, seventhly, in duplicating this construction until the bed of the stream has been bridged as far as necessary, substantially as described.

3. A method of building dikes, the same consisting, first in planting an anchor or foundation in the bank of a stream, secondly, in planting stakes or levers in said foundation in such manner that they will cant or tilt under sufficient pressure, applied in the form of any suitable weighted filling, thirdly, in securing said filling in position by means of ties or timbers, and fourthly, in temporarily binding the rear end of said ties or timbers upon a contiguous point of the structure, substantially as set forth.

4. A dike construction, consisting of a skeleton foundation or anchor, composed of two series of timbers with any suitable filling between them, said series of timbers being bound together in any suitable manner, a series of stakes or levers planted in the filling of said framework, and a series of timbers or ties arranged upon the filling interposed between the same and said skeleton anchor or foundation and said stakes or levers, and a second series of stakes or levers planted near the unsupported ends of the first-mentioned levers, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM FLYNN.

Witnesses:
M. R. REMLEY,
S. B. FALOR.