(No Model.)

A. M. KANTERS.

EMBANKMENT PROTECTOR.

No. 360,225. Patented Mar. 29, 1887.

Fig: 3.

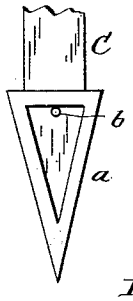


Fig: 1.

Fig: 2

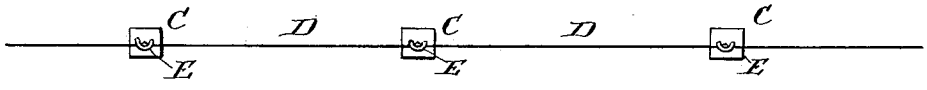


Fig: 5.

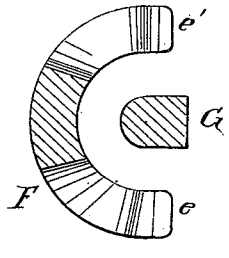


Fig: 4.

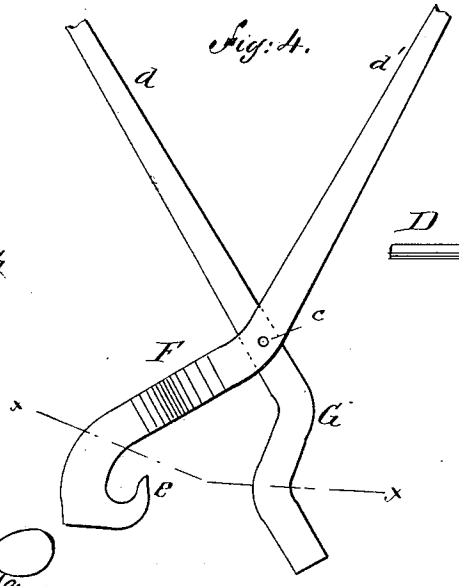
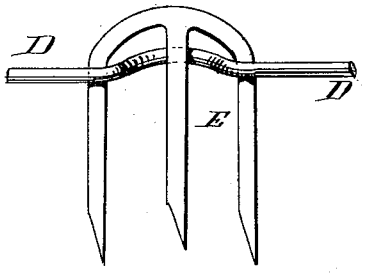


Fig: 6.



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UNITED STATES PATENT OFFICE.

ABRAHAM M. KANTERS, OF HOLLAND, MICHIGAN.

EMBANKMENT-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 360,225, dated March 29, 1887.

Application filed May 24, 1886. Serial No. 203,121. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM M. KANTERS, of Holland, in the county of Ottawa and State of Michigan, have invented new and useful Improvements in Embankment-Protectors, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a transverse section of an embankment to which my improvement has been applied. Fig. 2 is a plan view of the fastenings of the protector. Fig. 3 is a detail view of the end of one of the fastening-stakes. Fig. 4 is a side elevation of the tongs for bending the fastening-wire. Fig. 5 is a transverse section taken on line *x x* in Fig. 4. Fig. 6 is a side elevation of the fastening-staple, showing its application to the wire.

Similar letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to the protection of dykes and embankments of levees, canals, rivers, &c., against erosion and disintegration from the effects of the current, wave-wash, rain, frost, or other causes, by covering the exposed surface of the embankment with a suitable facing.

My invention consists in applying to the embankment a covering consisting of willow branches, cane, bark, cornstalks, or other flexible material to the required depth, and fastening the covering by means of stakes and cross-wires secured to the stakes, said stakes having conical or pyramidal points applied to and projecting beyond their lower ends.

The invention also consists of the combination, with the aforesaid parts, of the three pronged or pointed staple, with the central prong arranged on one side of the wire and the lateral or side prongs arranged on the opposite side of the wire, which wire is bent laterally, and the prongs are driven into the stakes or posts.

Upon the face of the embankment A is arranged a covering, B, of willow branches, cane, bark, cornstalks, or other suitable flexible material, the covering B being arranged to extend over the top of the embankment. Stakes C, provided with conical or pyramidal points *a*, are driven into the embankment through the covering B at suitable intervals. The points *a* of the stakes C are arranged to project beyond the sides of the stakes to secure a firmer hold upon the earth in which they are received, and the points *a* are secured in place on the ends of the stakes by pins or nails *b*, driven through apertures in the sides of the points into the stakes.

Wires D are stretched along the embankment above the ends of the stakes C, and are secured in place by three-pointed staples E, embracing the bent portion of the wire, as shown in Fig. 6, and driven down into the side or end of the stake, as shown in Figs. 1 and 2. The stretched wires are bent for the reception of the staple, and at the same time tightened by the employment of the tongs. (Shown in Figs. 4 and 5.) The tongs consist of two jaws, F G, connected together by the rivet *c*, and provided with handles *d d'*. The jaw F of the tongs is bent outward, widened, and concaved, and provided in opposite edges near its extremity with hooks *e e'* curved inward toward the pivot of the tongs and adapted to receive the wire D. The jaw G is offset or bent toward the jaw F. The wire being stretched along the tops of the stakes C, the tongs are applied to the wire above one of the stakes by bringing the hooks *e e'* into engagement with the wire and closing the handles *d d'* together, causing the jaw G to pass between the hooks *e* of the jaw F, thus bending the wire, so that when the three-pointed staple E is driven over the wire into the end of the stake the central point will be received in the bend and upon one side of the wire, and the lateral points will pass down upon the opposite side of the wire, thus clamping the wire firmly against the end of the stake and at the same time holding it against end motion.

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

1. The protector for embankments, formed of a layer of branches, stalks, or analogous material, and held in place by stakes driven into the embankment, and wires stretched along the face of the covering and secured to the stakes, said stakes having conical or pyramidal points applied to and projecting beyond their lower ends, substantially as described.

2. The combination, with a covering, B, of branches, stalks, or analogous material, of the stakes C, provided with metallic points *a*, wires D, stretched along the stakes and bent laterally, as described, and three-pointed staples E, driven into the ends or sides of the stakes over the bent portion of the wire, substantially as shown and described.

3. The combination, with the securing-wires of an embankment-protector, of the three pronged or pointed staple having the central prong arranged on one side of the wire and the lateral or side prongs arranged on the opposite side of the wire, said wire being bent laterally, and the prongs of the staple being driven into posts near the end thereof, along which the wire is stretched, substantially as and for the purpose set forth.

ABRAHAM M. KANTERS.

Witnesses:
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