(No Model.) 2 Sheets—Sheet 1.

H. RABITZ.

SYSTEM OF ANCHORING EARTHWORKS.

No. 589,856. Patented Sept. 14, 1897.

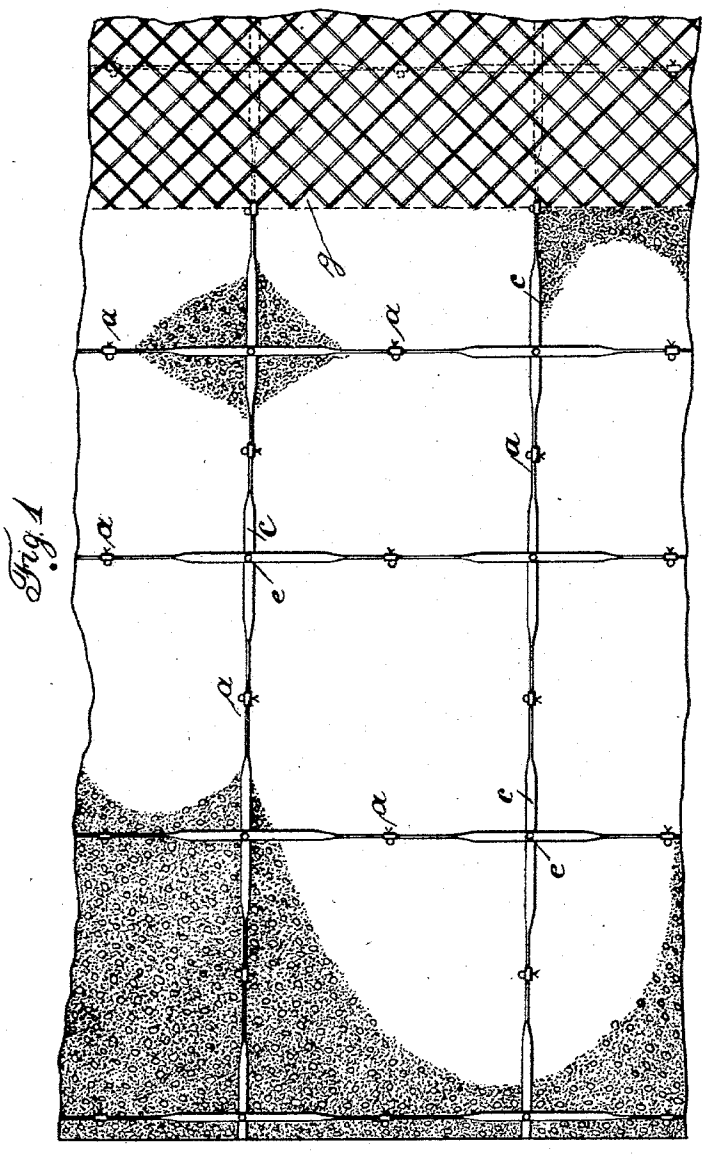


Fig. 1.

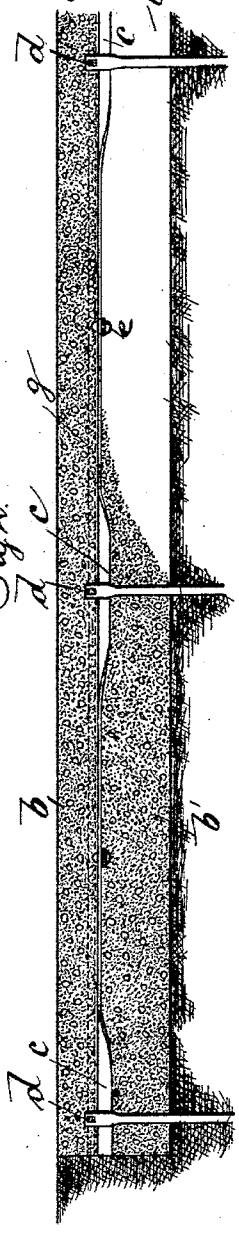


Fig. 2.

Witnesses:
R. S. Ober.

Inventor.
Hans Rabitz,
by Henry Orth
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

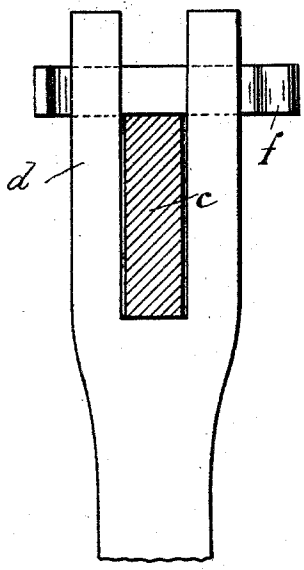


Fig. 4.

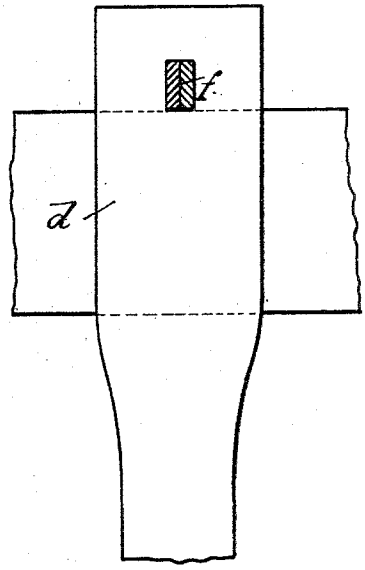
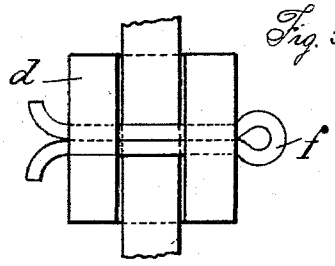


Fig. 5.



Witnesses:
B. F. Hart.
Henry Orth

Inventor.
Hans Rabitz.
By Henry Orth
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HANS RABITZ, OF BERLIN, GERMANY.

SYSTEM OF ANCHORING EARTHWORKS.

SPECIFICATION forming part of Letters Patent No. 589,856, dated September 14, 1897.

Application filed November 30, 1896. Serial No. 613,921. (No model.)

To all whom it may concern:

Be it known that I, HANS RABITZ, a subject of the German Emperor, residing at Berlin, Germany, have invented certain new and useful Improvements in and Relating to Systems or Methods of Anchoring Earthworks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to the construction of earthworks, and particularly to the construction of embankments of reservoirs, canals, sluices or locks, irrigating-ditches, &c., with a view to obtaining a solid and durable structure.

It has been the aim in the construction of embankments for water-reservoirs or waterways to obtain a facing capable of withstanding or resisting all external influences and meet as nearly as possible all requirements. It has, however, been impossible heretofore to construct these embankments so as to fulfil the required conditions, notwithstanding the great care taken and the enormous sums expended.

It is the object of this invention to provide means whereby the desired results referred to are attained in a comparatively economical manner, and to this end the essential features of my invention consist in constructing the facing for such embankments of concrete and anchoring the same to the earth by means of a net or checker work of intersecting iron rails firmly embedded in the concrete. In the anchoring of such facings to the earthwork it has been found necessary in order to obtain the best results that the anchor-rails should be subjected to tension in the direction of their length, and as this would involve considerable expense if done by the usual means I have devised a method whereby this can be effectually and economically done at a comparatively trifling expense. To this end I employ flat rails and secure the same on edge to suitable anchors and then twist them at right angles at those points where two rails cross or intersect, so as to present flat surfaces to each other, and can therefore be readily fastened together. In this manner the rails can be brought under a high tension that will impart to the facing the greatest possible rigidity, safety, and durability, owing to the immovable condition of the anchorage and the most advantageous or favorable distribution of the strain to which each individual rail is subjected either from concussions or vibrations of the earthwork.

That my invention may be fully understood, I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view, and Fig. 2 a longitudinal section, illustrating my improved system of constructing earthworks, and Figs. 3 to 5 are detail views of portions of the anchors.

In the above-described drawings, *a* indicates the anchoring or grappling bars or irons, having a forked head *d*, which irons are driven at suitable distances apart into the earthwork or bank in parallel intersecting rows, so as to project a suitable distance therefrom. I then face the bank with concrete *b* up to or substantially up to the forked heads of the irons *a*. I then lay flat rails C on edge into the forks of said irons, and secure them against displacement in any suitable manner, as by bolts, screws, cotters, or, as shown, by split pins *f*.

The rails C may be ordinary strap-iron, or when long rails are to be used they may be made of ordinary flat rolled merchant-iron, which is the cheapest obtainable, thereby obviating the necessity of having the rails made especially for the purpose.

At the points of intersection of the rails C, intermediate of the points at which such rails are secured to the anchor-irons *a*, a hole is bored, and at such points the rails are twisted at right angles to present their flat faces to each other and are secured together by bolts, rivets, or the like, as shown at *c'*.

The twisting of the rails at the points where they intersect can be effected by the simplest kind of a tool—as, for instance, a forked lever or other like tool—and I thereby impart to said rails an undulatory form, in that vertical and horizontal portions alternate with each other, while the rails are at the same

time brought under a high tension by the twisting of portions thereof at a right angle to other portions, whereby the edges of the rails are forced from a straight into a curved line, which evidently has the tendency of stretching the fibers of the rail-faces, which are thus placed under an efficient and constant tension. After the checker-work of the rails has been completed, as described, concrete is again supplied to fill out the spaces below and between the rails, embed the same, and complete the facing, as shown at *b'*.

The connection between the concrete and anchor may be made a more intimate or thorough one by securing to the checker-work of rails C a network of stout wires, as a coarse wire fabric, or of rods, as shown at *g*, Fig. 1, though this is not absolutely necessary.

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

1. An anchor for concrete facings for earthworks, comprising a checker-work of flat rails and anchors therefor, said rails secured on edge to said anchors and laid flat at the points of intersection, for the purpose set forth.

2. An anchor for concrete facings for earthworks, comprising a checker-work of rails having alternate portions at right angles to each other, anchors to which said rails are secured to present flat surfaces to each other at their points of intersection, at which point said rails are secured together for the purpose set forth.

3. An anchor for concrete facings for earthworks, comprising anchors having forked heads, a series of intersecting rails having alternate portions at right angles to each other set on edge and secured in the fork of their anchors to present horizontal or flat portions to each other at the points of intersection, at which points said rails are secured together, for the purpose set forth.

4. A facing for earthworks, comprising a checker-work of flat rails, grounded anchors having forked heads in which the rails are set on edge, said rails being laid flat and bolted or riveted together at their points of intersection, means for securing the rails against longitudinal displacement in the anchor-heads, and a body of concrete in which said parts are completely embedded, substantially as and for the purpose set forth.

5. A facing for earthworks, comprising a checker-work of flat rails, grounded anchors having forked heads in which the rails are set on edge, said rails being laid flat and bolted or riveted together at their points of intersection, means for securing the rails against longitudinal displacement in the anchor-heads, a coarse-mesh wire fabric secured to said rail checker-work, and a body of concrete in which said parts are completely embedded, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HANS RABITZ.

Witnesses:
ED. WÜRTEMBERG,
ADOLF LUEDECKE.