

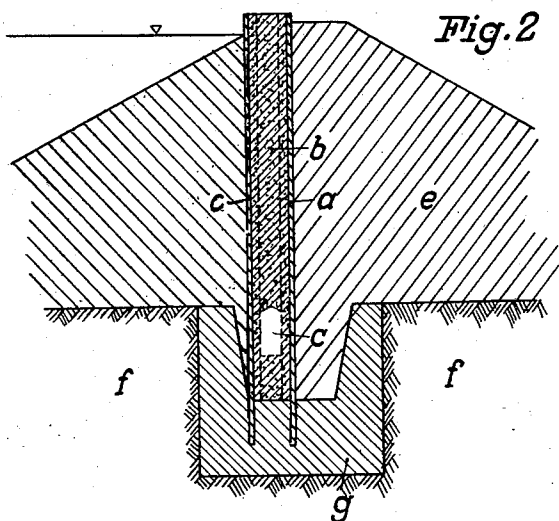
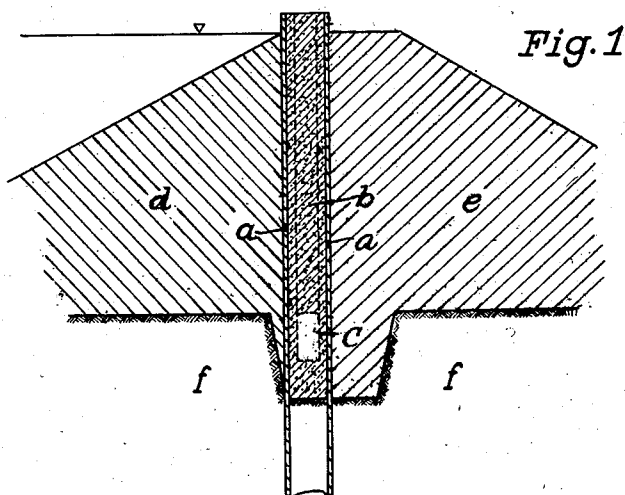
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PACKING CORE FOR EARTH DAMS

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## UNITED STATES PATENT OFFICE

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## PACKING CORE FOR EARTH DAMS

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7 Claims. (Cl. 61—31)

This invention relates to a core for earth dams, particularly retaining dams.

The safety of earth dams is determined, above all, by their permeability to water, and special attention is therefore paid to making them tight by providing a special tightening core in the center thereof, especially in case of high dams.

The existing kinds of cores made of sheet iron, concrete or reinforced concrete and constructed either solid or hollow with control passages and shafts suffer from the drawback that they do not sufficiently respond to the motions of fresh embankments caused by water pressure with the result that crevices appear which might endanger the entire dam construction. To guard against this possibility horizontal motion joints have been provided for such cores, but this construction too has failed to insure perfect packing.

The invention eliminates the defects mentioned by providing a core consisting of two or more tight elastic walls which though closely connected with the building ground are not interconnected, the space between every two successive walls being occupied by a permeable filler.

In the drawing two embodiments of the invention are shown. Figures 1 and 2 show respectively cross-sections of the two embodiments of the dam.

In the figures *a* designates the elastic thin walls of the core of the dam, between which is disposed the filler *b*. Between the core walls and within the filler are arranged the control passages or shafts *c*. On opposite sides of the dam core are the sloping embankments *d* and *e* of the dam material, heaped on the foundation *f*. As shown in Fig. 1, the foundation *f* is entirely of earth; as shown in Fig. 2, a masonry base *g* is provided for the core, the remainder of the foundation being of earth.

The elastic thin walls *a* are capable of following the motions of the embankment *d, e* without causing destruction of their structure, notwithstanding the fact that these motions are quite considerable especially during the initial operating period according to the changing water level. Owing to the deep foundation of the walls and the enlargement of the foundation sole of the dam, excessive shearing stresses are avoided at the fixing points of the walls which may be sufficiently spaced apart, to provide room for the passage *c*. By means of this passage the interior of the core can be inspected to ascertain the condition of the iron walls *a* and the filling *b*, so that deterioration of the core

may be controlled. Should it be found after years of operation that the material of the walls is rotten and full of cracks, or if other reasons make it desirable, the filler *b* lying between the walls may be consolidated by the injection of cement or flushing with loam. The stiffening of the core due to this consolidation will not cause any trouble, since the dam layers have sufficiently settled and the stiff core will be capable of taking up the correspondingly reduced motions of the dam. As shown in Fig. 2, the lower ends of the opposite metallic walls *a* are seated in the masonry base *g* embedded in the earth foundation *f* of the dam. The masonry base, when used, stiffens the foundation of the dam to withstand excessive pressure.

The tight elastic walls of which the packing core is composed may consist, for example, of iron, steel or other metals in the form of sheets, corrugated sheets, grooved plates, sheet piles and the like, or they may be composed of several materials acting in conjunction with one another, a few examples of them being iron or steel fabric with rough plastering of suitable cementitious material; brick or concrete stone walls with iron insertions; or fibrous tissues, such as canvas or cotton cloth saturated with bitumen.

As permeable fillers for the space between two walls arranged one behind the other may serve, for instance, sand, gravel, broken stones, broken bricks, stratified layers of quarry stone, bricks or concrete stones.

Besides the advantages mentioned, a core construction according to the invention involves the further advantage of a considerable reduction in cost compared with known concrete cores.

I claim:

1. A packing core for earth dams and the like, consisting of at least two water impermeable and elastic walls arranged with a space between them within the dam and being unconnected with one another, the said walls projecting with their lower portion into the building ground and being fixed to the same, and a water permeable filler in the space between the said walls.

2. A packing core for earth dams and the like, consisting of at least two water impermeable and elastic walls arranged with a space between them within the dam and being unconnected with one another, the said walls consisting of sheet iron and projecting with their lower portion into the building ground and being fixed to the same, and a water permeable filler in the space between the said walls.

3. A packing core for earth dams and the like, 55

consisting of at least two water impermeable and elastic walls arranged with a space between them within the dam and being unconnected with one another, the said walls consisting of corrugated sheet iron and projecting with their lower portion into the building ground and being fixed to the same, and a water permeable filler in the space between the said walls.

4. A packing core for earth dams and the like, consisting of at least two water impermeable and elastic walls arranged with a space between them within the dam and being unconnected with one another, the said walls consisting of sheet iron and projecting with their lower portion into the building ground and being fixed to the same, and a water permeable filler in the space between the said walls consisting of sand.

5. A packing core for earth dams and the like, consisting of at least two water impermeable and elastic walls arranged with a space between them within the dam and being unconnected with one another, the said walls consisting of sheet iron and projecting with their lower portion into the

building ground and being fixed to the same, and a water permeable filler in the space between the said walls consisting of a gravel.

6. A packing core for earth dams and the like, consisting of at least two water impermeable and elastic walls arranged with a space between them within the dam and being unconnected with one another, the said walls consisting of sheet iron and projecting with their lower portion into the building ground and being fixed to the same and a water permeable filler in the space between the said walls consisting of broken stones.

7. A packing core for earth dams and the like consisting of at least two water impermeable and elastic walls arranged with a space between them within the dam and being unconnected with one another, the said walls projecting with their lower portion into a recess of the building ground to which they are anchored and extending with their upper edge at least to the surface of the dam, and a water permeable filler in the space between the said walls.

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