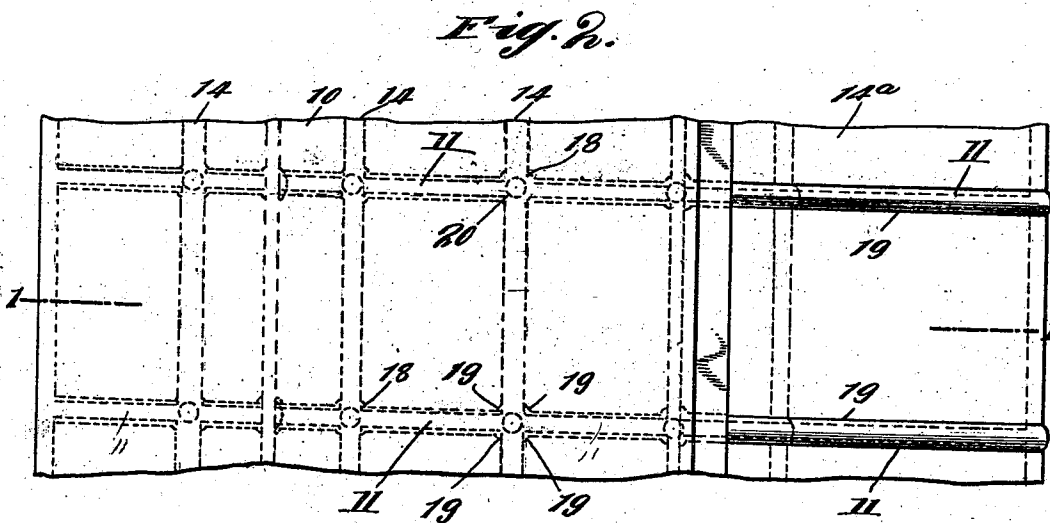
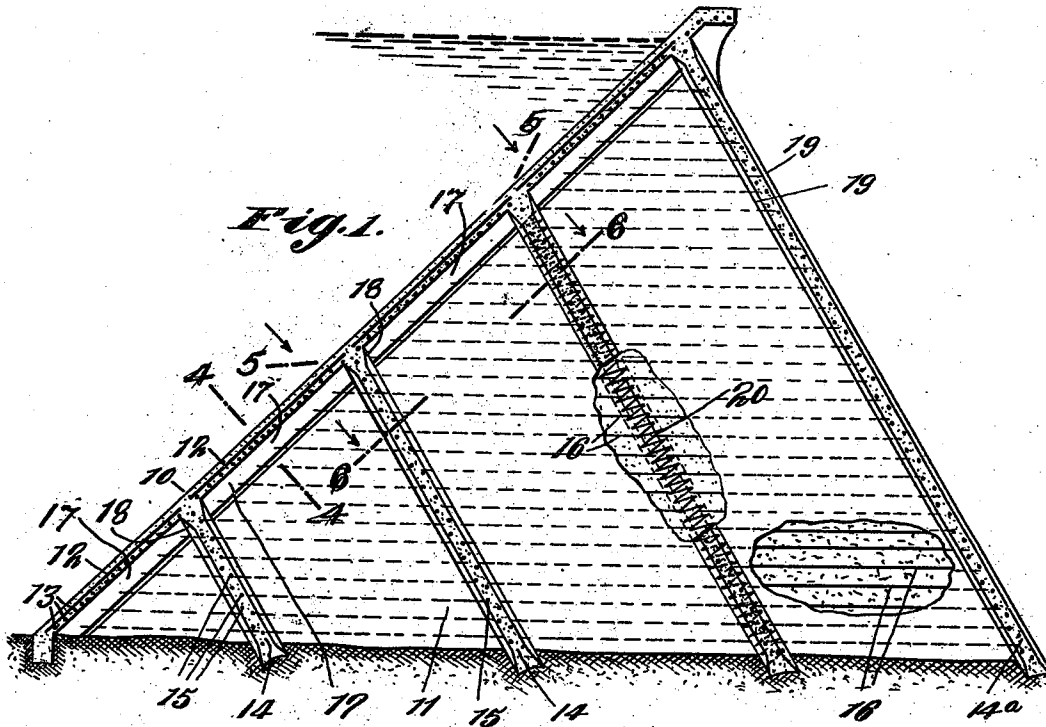


W. S. EDGE.
DAM CONSTRUCTION.
APPLICATION FILED FEB. 17, 1911.

1,010,131.

Patented Nov. 28, 1911.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

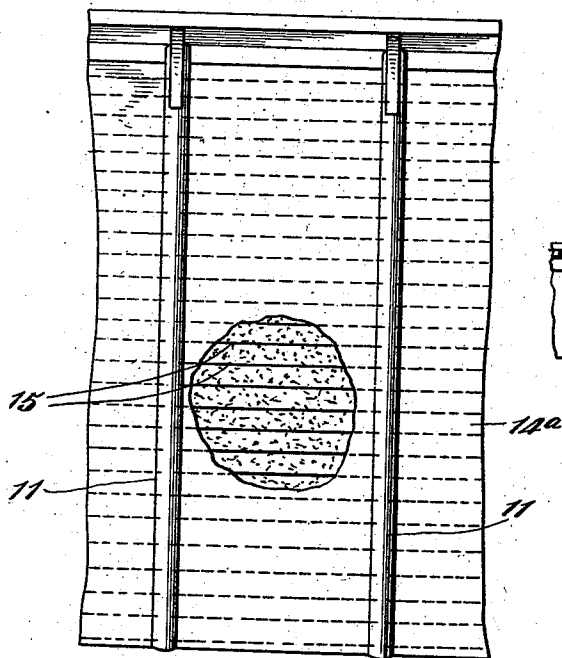


Fig. 3

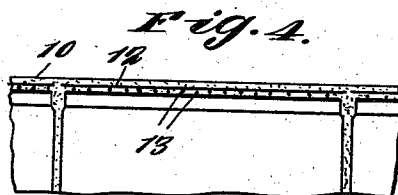


Fig. 4.

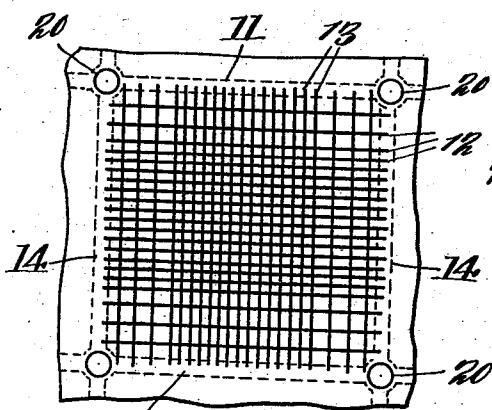


Fig. 5.

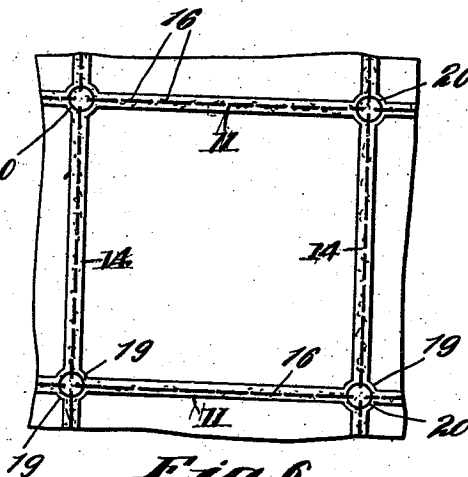


Fig. 6.

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UNITED STATES PATENT OFFICE.

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DAM CONSTRUCTION.

1,010,131.

Specification of Letters Patent. Patented Nov. 28, 1911.

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To all whom it may concern:

Be it known that I, WALTER S. EDGE, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Dam Constructions, of which the following is a specification.

My invention relates to dam constructions, and the object of my invention is to provide an improved construction in which concrete is used and reinforced by metal rods in such a manner as to brace and strengthen the dam, and thus to reduce the amount of concrete necessary to make a safe construction.

A further object is to arrange the walls and buttresses in such a manner as to best carry the weight, with a minimum quantity of concrete, and thereby reduce the cost of providing the structure.

A further object is to provide means whereby the expansion and contraction of the structure as a whole, will not cause the deck of the dam to crack, by reason of uneven expansion between the concrete and reinforcing rods.

A further object is to provide exceptionally strong joints between the buttresses and side walls and to provide at these junctions, pillar constructions which extend from the base of the dam to the deck, and where thought to be necessary, to strengthen these pillar portions with metal reinforcement.

The deck may be supported by the buttresses and walls, or may be formed integral, depending on local conditions and the specific plans furnished by the engineer, in charge of the work.

In the drawings which form a part of this specification, the deck is shown as formed integral with the walls and buttresses.

Referring to said drawings, Figure 1 is a cross sectional view through a dam embodying my invention, with portions of the wall broken away to disclose certain features of construction. Fig. 2 is a plan view of a portion of the dam, Fig. 3 is a rear view of a portion of the dam, Fig. 4 is a sectional view through a portion of the deck to illustrate the location of the reinforcing rods. Fig. 5 is a view of a portion of the deck to further illustrate the arrangement of the reinforcing rods embedded therein, it being understood that the rods are shown as exposed

for the purpose of clearness only. Fig. 6 is a plan view of the walls and buttresses with the pillars formed integral, and all of same reinforced by metal portions, the deck being removed.

The dam consists primarily of an inclined upstream deck 10 supported by vertical walls 11 running parallel to the stream, and inclined walls or buttresses 14—14 and 14^a extending across the stream and the walls and buttresses joined integrally where they cross each other. By this arrangement a series of rectangular walls are provided, on the tops of which the deck 10 is supported. It will therefore be seen that the deck may be divided up into rectangular slab-like sections, the ends of each section extending half-way across the thickness of each wall, so that the weight of water being known which the deck and walls must support, the thickness and strength of the deck and walls may be easily ascertained. Each section may be formed with expansion joints in which the reinforcing rods extend from wall to wall only, as illustrated in Fig. 5, and series of rods 12 and 13, crossing each other and placed nearer together near the middle of the walls than they are spaced adjacent thereto, to more perfectly carry the load, as will be readily understood. By this arrangement each section becomes a unit construction and the thickness of the deck and the reinforcement may be varied at different portions of the structure to most perfectly carry the load and resist the strains set up. If desired, each section of the deck may be cast separately and laid in position and secured to the walls in any proper manner.

The inclined walls or buttresses 14 which extend across the stream are reinforced in those cases where the dam is sufficiently high to need reinforcing, by rods 15 which may extend from wall to wall as illustrated in Fig. 3, or may extend unbroken across the stream if preferred, entirely embedded in the said walls. The walls 11, running parallel to the stream may also be reinforced by the rods 16, which extend from wall to wall, or continuously the entire length thereof, as desired. To further strengthen the construction, corbels 17 are formed of concrete at the junction of the deck and walls 11, and corbels 18 at the junction of the deck and walls 14, each of which extend from wall to wall, as will be readily understood.

In high temperatures, or otherwise where cement can be saved by reinforcing or where great strength is required, pillars 18 are constructed integral with the walls, by forming fillets 19, which extend from top to bottom of the walls, and thus permit of the walls being made of less thickness, since the fillets serve to stiffen the construction. In cases where greater strength is needed, these pillars are each reinforced by a rod 20 formed into a helix and embedded in the concrete, and extending from the bottom to the top of the walls. The angle at which the walls 14 preferably rest, is the angle at which the resultant forces of the weight and pressure of the water combined would create a pressure through the center from the top to the bottom thereof.

By reason of the rear wall, indicated by 14^a extending down-stream beyond the top of the deck, the water, in flowing over the dam, falls first on the upper side of this wall and flows down over same, thus preventing noise and the ground from being washed away to a certain degree, by the water.

The dam may be provided with a solid floor when built on a poor foundation, but in the present drawings the buttresses are shown as resting in trenches in the ground. Openings may be provided from cell to cell through the supporting walls through which entrance can be made for purposes of inspection, and to permit the escape of water in case of a leak in the deck. The cells formed between the walls may be filled with loose rock or earth where same is plentiful and can be obtained at a low cost, thus giving greater weight to the construction and permitting the walls to be built with less concrete, thereby reducing the cost of construction.

By the construction of a dam as above specified the dam may be built at a low cost and of great strength and durability.

Having thus described my invention, I claim:

1. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, substantially as set forth.

2. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith.

3. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, and corbels placed on said walls at the junction of said deck.

4. A dam embodying a deck supported by

buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and means for bracing said buttresses and extending at right angles thereto.

5. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, and pillars formed at the junction of said walls and buttresses.

6. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, and pillars having reinforcing means embedded therein.

7. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, and a pillar containing a spirally formed rod embedded therein.

8. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, and a plurality of pillars each containing a spirally formed rod embedded therein.

9. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, said buttresses having reinforcing rods embedded therein and extending from one side wall to the adjacent side wall as set forth.

10. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, said buttresses having reinforcing rods embedded therein and extending from one side wall to the adjacent side wall, and reinforcing rods embedded in said walls.

11. A dam embodying a deck supported by buttresses which extend across the stream, the walls of which are inclined at an angle to the vertical, and walls extending across said buttresses and formed integral therewith, said buttresses having reinforcing rods embedded therein and extending from wall to wall, and reinforcing rods embedded in said walls and extending from buttress to buttress.

12. A dam embodying a deck divided into sections, each section of which is provided

with reinforcing rods which extend from wall to wall and from buttress to buttress, as set forth.

13. A dam embodying a deck which is divided into sections, inclined buttresses supporting said deck, walls extending across said buttresses and supporting said deck, corbels carried by said walls, each of said sections having reinforcing rods embedded therein which extend from buttress to buttress above said corbels.

14. A dam embodying a deck which is divided into sections, inclined buttresses supporting said deck, walls extending across said buttresses and supporting said deck, each of said sections having reinforcing rods embedded therein which extend from buttress to buttress.

15. A dam embodying a deck which is divided into sections, inclined buttresses supporting said deck, walls extending across said buttresses and supporting said deck, each of said sections having reinforcing rods embedded therein which extend from buttress to buttress, and rods extending across said first rods from wall to wall, the rods being spaced nearer together as they approach the center of the walls, substantially as described.

16. A dam embodying an inclined deck, a wall which is inclined from the vertical and supporting said deck and extending beyond the downstream side thereof, the rear side of which serves as a water shed for the water which may flow over the top of the dam, substantially as set forth.

17. A dam embodying a deck supported by a plurality of buttresses spaced apart from each other and extending from side to side of the stream and supporting said deck, and a plurality of walls spaced apart from each other and extending across said buttresses and serving to brace the same in position.

18. A dam embodying a deck, a plurality of buttresses spaced apart from each other

and extending from side to side of the stream and supporting said deck, a plurality of walls spaced apart from each other and extending across said buttresses and serving to brace the same in position, and reinforcing rods embedded in said walls and buttresses.

19. A dam embodying a deck, a plurality of buttresses spaced apart from each other and extending from side to side of the stream and supporting said deck, a plurality of walls spaced apart from each other and extending across said buttresses and serving to brace the same in position, said buttresses and said walls being formed integral with the deck, and reinforcing rods embedded in said walls and buttresses.

20. A dam embodying a deck, a plurality of buttresses spaced apart from each other and extending from side to side of the stream and supporting said deck, a plurality of walls spaced apart from each other and extending across said buttresses and serving to brace the same in position, and a pillar formed at the junction of each wall and buttress.

21. A dam embodying a deck, a plurality of buttresses spaced apart from each other and extending from side to side of the stream and supporting said deck, a plurality of walls spaced apart from each other and extending across said buttresses and serving to brace the same in position, reinforcing rods embedded in said walls and buttresses, and a pillar having reinforcing means embedded therein and located at the junction of the walls and buttresses and formed integral therewith.

Signed at New York city in the county of New York and State of New York this 15th day of February A. D. 1911.

WALTER S. EDGE.

Witnesses:

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JOSEPH H. MELVILLE.