(No Model.)

H. W. R. STRONG.

DAM AND RESERVOIR CONSTRUCTION.

No. 374,378. Patented Dec. 6, 1887.

Fig. 1.

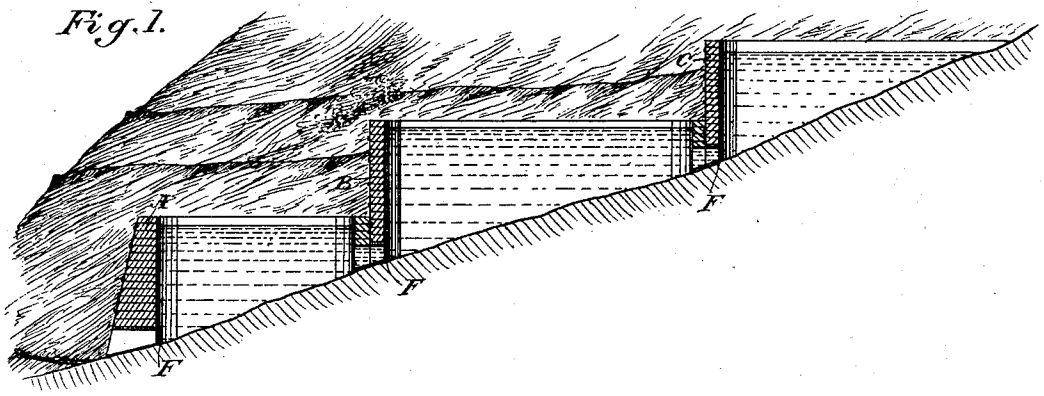


Fig. 2.

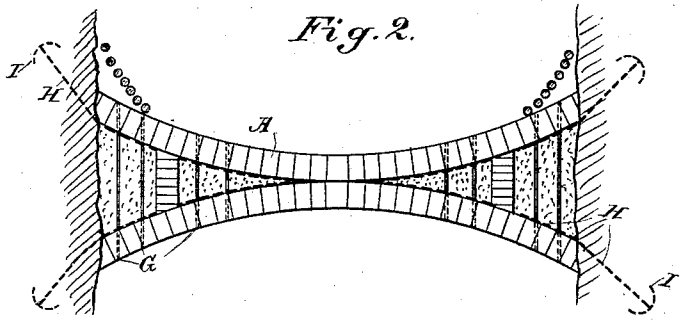


Fig. 3.

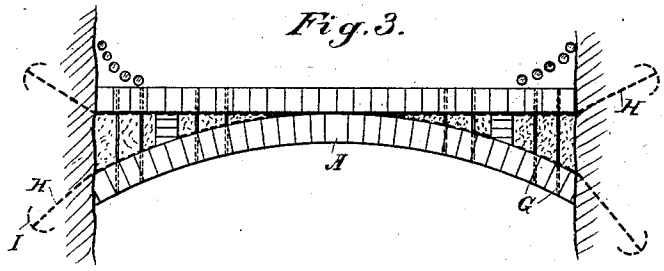
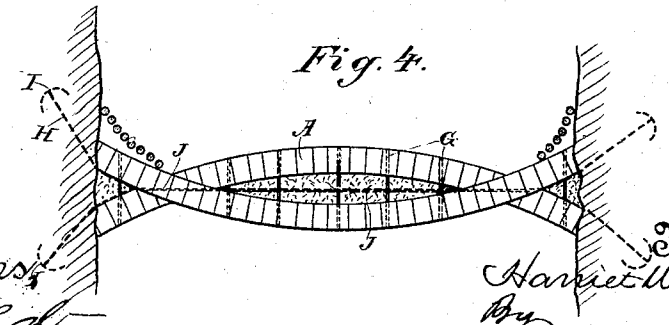


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRIET W. R. STRONG, OF LOS ANGELES, CALIFORNIA.

DAM AND RESERVOIR CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 374,378, dated December 6, 1887.

Application filed June 30, 1887. Serial No. 243,050. (No model.)

To all whom it may concern:

Be it known that I, HARRIET W. R. STRONG, of Los Angeles, county of Los Angeles, State of California, have invented an Improvement in Dam and Reservoir Constructions; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a construction for dams or reservoirs to be employed in a system of irrigation, and for the purpose of impounding and saving water in steep water courses or valleys and in other similar localities.

It consists of a series of dams of peculiar construction placed, successively, in the channel or water-course, and at such a distance apart that the water in the lower basins acts as a brace and support for the dams above.

It also consists of certain details of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a series of dams and reservoirs, showing my invention. Figs. 2, 3, and 4 are detailed plan views showing the construction of the dams.

In many parts of the country, and especially those where long rainless seasons occur—as in Southern California—water is exceedingly valuable, and it is very difficult to collect and save it, owing to the steep cañons and water-courses through which the water rushes with great rapidity and escapes and is lost within a few hours. These valleys and water-courses rarely have any extended basins which may be used as reservoirs, and I have therefore designed a system whereby the water may be collected during the rainy season and held for use in the dry seasons with a sufficient head for distribution over the land for irrigating purposes when desired.

In carrying out my system I build a series of dams, one behind the other, in the water-course or valley or channel, and at such a distance apart as may be determined by the steepness or inclination of the channel. The distance between these dams is such that when the water has filled the lower dam it will extend up to a certain height upon the lower face of the dam B above, and after this dam has been filled the water in like manner acts as a support for the dam C, which is above that, and so on for any number of dams which it may be desired to use. These dams are provided with gates F, through which the water may be discharged from one to the other.

In filling the reservoirs the water is allowed to pass through the gates of the upper dams into the lowest one, A, until its reservoir has been filled to the proper height, the water at the same time backing up against the dam B and also partially filling the reservoir of B. The gate F is then closed, and in like manner the remainder of the reservoir B is filled, after which the gate of C is closed, and so on, to the uppermost of the series. By this construction each of the upper dams may be made of less strength than if they were to sustain the whole pressure of the water, because the back-pressure of the water in the dams below acts as a support against their lower faces, and the strength needed is only sufficient to resist the pressure due to the difference in the level of the water above and below the dam. The lower dam, having no back-pressure, must be made the strongest of all.

Various forms for the construction of these dams may be employed. In Fig. 2 I have shown the dams A formed of masonry or stone, which is built in the form of reversed arches, with the convex faces toward each other, the keystone of these arches standing about the center of the dam, as shown. The earth and material where the dam is to be built is excavated to a sufficient depth and width to secure proper solidity for the base and ends of the walls, which are then laid up in cement to the proper height, and they are preferably united by rods or chains G, extending from one to the other, as shown. The spaces between the walls may also be divided into chimneys or open wells by means of transverse walls, which serve to unite and bind the two arched walls, as shown, and these spaces are then filled with gravel or earth, as may be desired.

In order to still further strengthen the arched walls A, I employ chains H, which pass around the convex faces of the walls, being preferably supported by passing through holes drilled in the blocks of stone or other material which form these walls. At the ends these chains are attached to anchors I, which are firmly fixed in the material forming the bank of the channel.

In Fig. 3 I have shown the lower wall of the

dam made in the form of an arch and the upper one in a straight line, the chains in this case being carried backward or up the stream from the ends of the straight wall to anchors, as before described.

In Fig. 4 I have shown the reversed arches crossing each other, with the cables or rods J extending through the space between the two arches to unite them, the other portions of the constructions being similar to that before described. Above the upper walls one or more rows of piles or timber-work may be fixed near each end to prevent the wearing away of the bank by the water. By this construction I produce a dam which has great strength and will resist any strain which may be brought upon it. Water having been collected in the dams until they are full, as previously described, when it is to be used it will be drawn first from the upper reservoir until the water reaches the level of that below. The pressure upon the opposite sides of the dam will be entirely equalized, and the gate between the two may be left open, and water will then be drawn from the second one into the next below, being discharged as fast as drawn into the succeeding one, and so on until all the reservoirs have been emptied. Each dam has its separate service-pipe or conduit, so as to supply different elevations. By this system the pressure upon the walls of all the dams except the lower one will be reduced to a minimum, and as fast as the water is drawn down it is taken off altogether. By this system I am enabled to collect a large body of water and retain it at a small comparative expense for dams and reservoirs, and it may be used from any of the reservoirs at pleasure, the upper one having such a height as to produce any desired pressure or elevation to supply the water to large areas which may need irrigation, or for other purposes.

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

1. The improvement in collecting and retaining water, consisting of a series of reversed arched dams built one above the other in an inclined channel, water-course, or valley, so that the water in each lower dam acts as a brace and support for the dam above, the whole being connected by gates, substantially as herein described.

2. A series of dams placed one above the other in a channel or valley, and having the walls formed of reversed arches, with the connecting-rods, and the chains and anchors, substantially as herein described.

3. The series of reversed arched dams with their convex faces adjacent to each other and standing transversely across the channel, in combination with the chains extending about the convex faces and connected with anchors in the banks of the channel, the transverse uniting rods and walls, and the filling of gravel and earth, substantially as herein and for the purpose described.

In witness whereof I have hereunto set my hand.

HARRIET W. R. STRONG.

Witnesses:
J. S. CHAPMAN,
J. W. HENDRICK.