

*D. Green.*

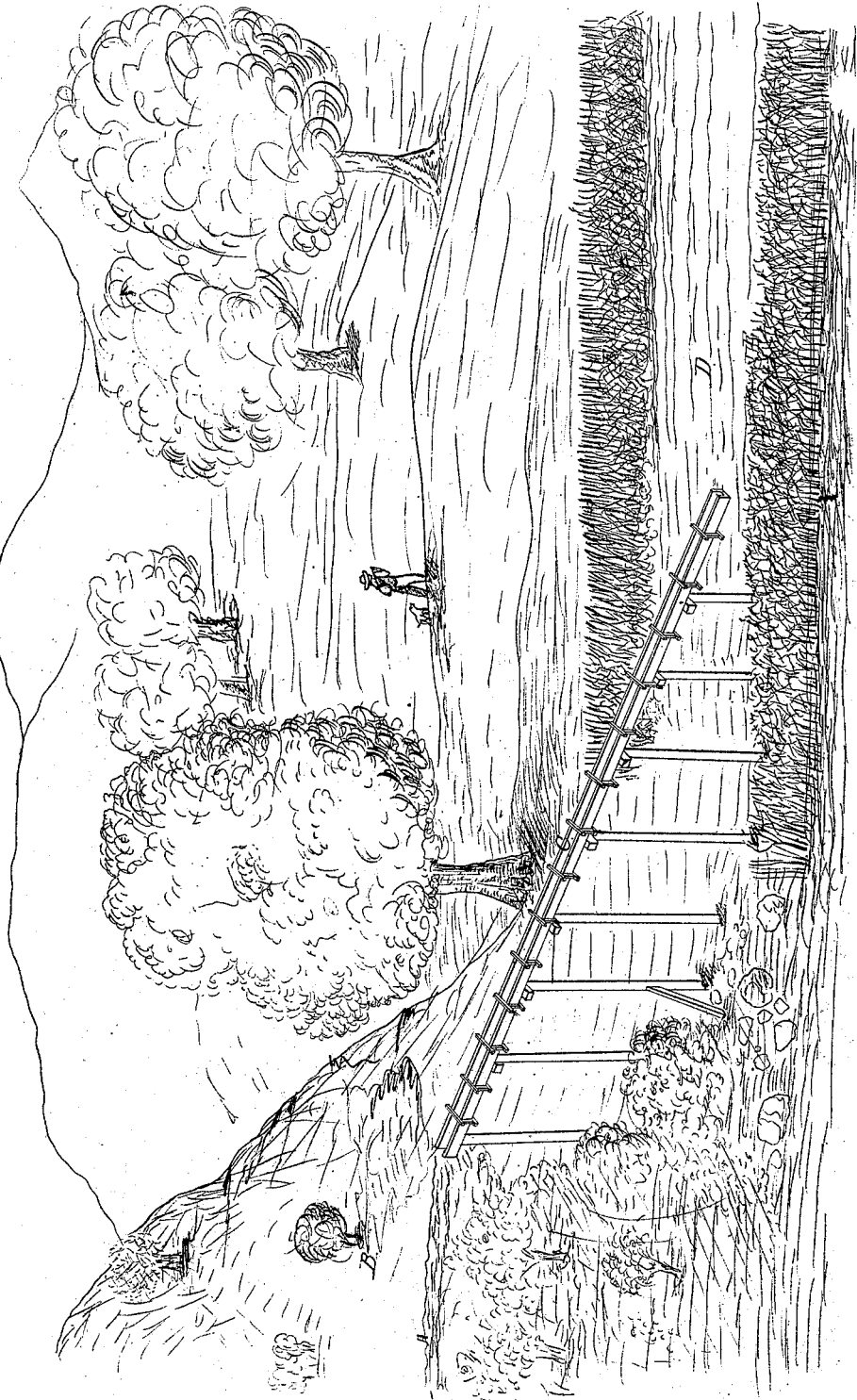
*Sheet 1-2, Sheets.*

*Excavator.*

*N<sup>o</sup> 7,426.*

*Patented Jan. 11, 1850.*

**Fig. 1**



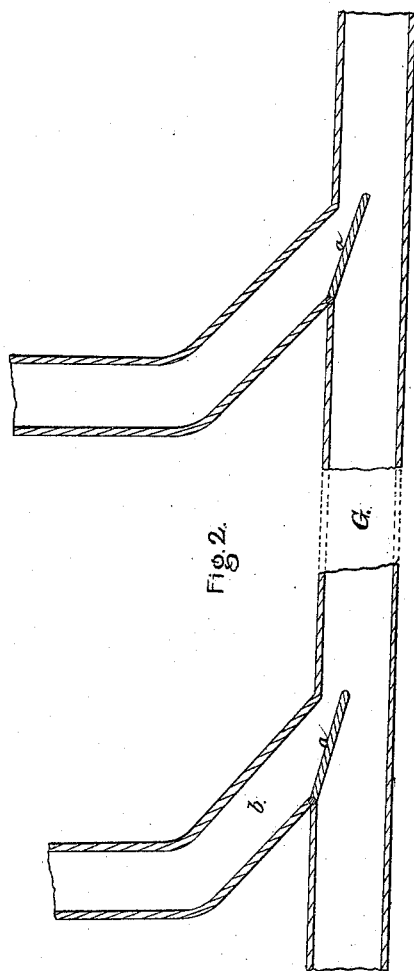
*D. Green.*

*Sheet 2-2, Sheets.*

*Excavator.*

*N<sup>o</sup> 7,426.*

*Patented Jan. 11, 1850.*



# UNITED STATES PATENT OFFICE.

DUFF GREEN, OF DALTON, GEORGIA.

## METHOD OF FORMING EMBANKMENTS, LEVEES, &c.

Specification of Letters Patent No. 7,425, dated June 11, 1850.

*To all whom it may concern:*

Be it known that I, DUFF GREEN, of Dalton, in the county of Murray and State of Georgia, have invented certain new and useful Improvements in the Methods of Removing Earth, Constructing Embankments, and Filling Up of Low Lands, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which exemplifies the manner in which my invention is carried into effect and which forms part of this specification.

My invention consists in conveying the earth from the site whence it is to be removed to the place where it is to be deposited by means of a current of water caused to flow artificially in a trough or trench from the one place to the other with sufficient velocity to carry along with it the earth thrown therein, but which, when it arrives at the place of deposit has its velocity sufficiently checked to be no longer capable of carrying along the earth which is therefore deposited.

In order to form an embankment by my process I commence by constructing brush dams on each side of the space on which the embankment is to be formed; I then select as the site whence the earth is to be furnished the nearest high ground to which a stream of water can be conveniently conveyed from some higher source or to which it can be raised from some lower source; from this site to the space between the brush dams, I construct a trench or trough with a sufficient descent to give the water running through it the requisite velocity to carry along the earth thrown therein. If now the water be caused to flow through the trough so formed and the earth be thrown into it, the latter will be carried with the water into the space between the brush dams where the velocity of the water, from the large space over which it is distributed, is checked to such a degree that it can no longer carry along the earth which is therefore deposited, the heavier portions nearer the mouth of the trough, and the lighter at distances from it proportioned to their density, the brush dams acting as fillers to retain the earth and allow the water to escape.

In the drawing hereunto annexed I have represented the water as conveyed by means of a canal or trench A (Figure 1) to the ground B from which a trough C is con-

structed to the space D between the brush dams E, E. The earth at the high ground is thrown into this trough and discharged between the dams.

Where brush can not conveniently be procured in sufficient quantity, the dams may be made of earth in which waste-weirs should be made at some distance from the foot of the trough to allow the surface water to flow off. As the greatest deposit takes place near the foot of the trough the latter must be gradually extended in different directions to cause the embankment to rise equally and as the space between the dams is gradually filled up, the latter must be progressively raised until the embankment reaches the requisite height, care being taken to give them the requisite batter to ensure the stability of the embankment. In filling up low lands it may only be necessary to construct a single dam at the lowest side of the space to be fitted up as the ground rising on the other sides will itself retain the water.

In cases where the distance between the two sites is considerable it may be expedient to substitute a close pipe (G Fig. 2), in place of the open trough and to keep up the velocity of the water by the introduction, at suitable intervals, of supplementary streams (b). In such cases care should be taken to cause the supplementary streams to enter the pipe (as at Fig. 2) at a small angle in the same direction in which the water in the pipe is flowing, and a hanging gate  $\alpha$  should be placed at such points to prevent the reflux of the water from the main pipe into the pipe which conveys the supplementary stream.

The examples given herein are sufficient to show the manner of carrying my invention into practice, but it is obvious that my invention admits of far more extended applications, and I intend to apply it and claim the right to use it wherever it is applicable for engineering or other purposes and especially to making levees or embankments on the banks of rivers; in these cases or when used for conveying earth to a considerable distance it will be expedient to construct the main pipe with branches and openings by means of which lateral or cross embankments can be made; these branches will also be of use in removing obstructions from the main pipe as the latter may be shut off below the branch or opening nearest the

obstruction and the whole force of the water will then act to drive the obstruction through the branch.

What I claim as my invention and desire  
5 to secure by Letters Patent is—

The method herein described of depositing earth to form embankments, levees, etc., and to fill up low situations, by means of filtering dams, or their equivalents, and a  
10 trough or conduit conveying earth and

water from a higher level, substantially as herein specified.

In testimony whereof I have hereunto subscribed my name this nineteenth day of March A. D. 1850.

DUFF GREEN.

Witnesses:

P. H. WATSON,  
E. S. RENWICK.