A. BRAMER.

DITCHING MACHINE.

APPLICATION FILED AUG. 25, 1919.

1,356,426. **Patented Oct. 19, 1920.**

Fig. 1.

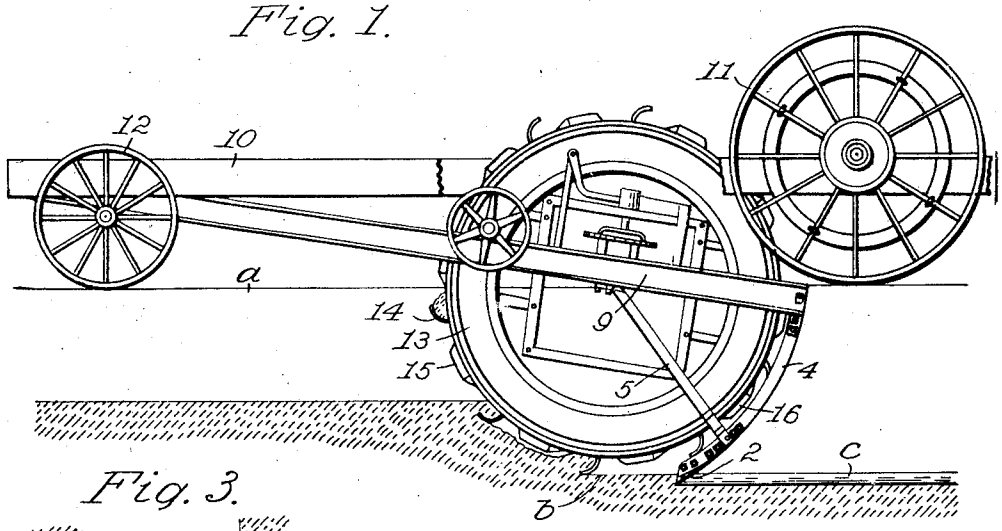
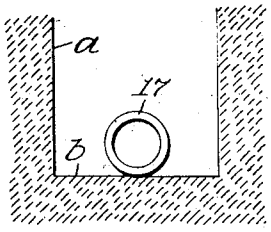


Fig. 3.



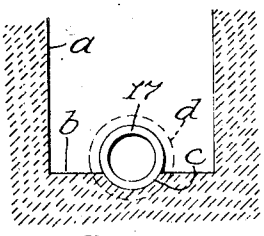


Fig. 4.

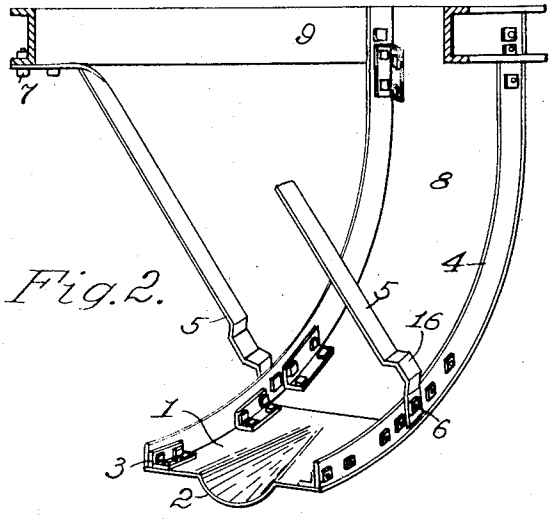


Fig. 2.

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UNITED STATES PATENT OFFICE.

ALBERT BRAMER, OF AREDALE, IOWA.

DITCHING-MACHINE.

1,356,426. Specification of Letters Patent. Patented Oct. 19, 1920.

Application filed August 25, 1919. Serial No. 319,529.

To all whom it may concern:

Be it known that I, ALBERT BRAMER, a citizen of the United States of America, and a resident of Aredale, Butler county, Iowa, have invented certain new and useful Improvements in Ditching-Machines, of which the following is a specification.

My invention relates to improvements in ditching machines, and the object of my improvement is to provide for machines used to excavate trenches to receive tiling, auxiliary devices combined therewith to form in a trench a longitudinal trough shaped to fit and properly support hollow tiling alined therein.

This object I have accomplished by the means which are hereinafter described and claimed, and which are illustrated in the accompanying drawings, in which Figure 1 is a side elevation of parts of the mechanism and frames of a trench excavating machine, with parts of each removed or broken away, supplied with my improved troughing device; Fig. 2 is an enlarged perspective view of said troughing device; and Figs. 3 and 4 are like cross-sections of a trench formed with and without a tile receiving trough respectively as made by my device.

In said drawings, similar numerals and characters of reference denote corresponding parts throughout the several views.

My invention herein is additional to and a feature of improvement upon my ditching machine, upon which an application for patent is pending in the United States Patent Office, Serial No. 193,511, filed September 27, 1917, hence I do not specifically show, describe nor claim other features of said machine, but illustrate only such parts thereof as will render clear the use and construction or supporting-means of my present device.

Referring to Fig. 1, the numeral 10 denotes the main frame of a ditching machine supported on carrying and on traction-wheels 12 and 11 respectively. A sub-frame 9 is pivotally connected at one end to said main frame 10 to swing up and down with a rotatable excavating-device 13, but the means and mechanisms for imparting rotation to the traction-wheels, and for rotating and raising or lowering the excavating device have been omitted for the sake of clearness. About the circumferential periphery of said rotary excavating-device are equidistantly and alternately arranged excavating-blades 14 and edge-trimming blades 15, whose construction and operation are sufficiently described in my said preceding application, but the excavating-device in its rotation and forward movement is adapted to excavate a trench *a* with flat bottom *b*.

My trough-cutting device comprises a pair of like forwardly and downwardly curved arms or hangers 4 fixed to the free ends of the side-bars of the sub-frame 9 and having the rear part of their interspace closed by the curved imperforate plate 8 which extends downwardly to a certain distance from the forward extremities of said hangers. The remainder of the interspace is closed by a cutting-plate 1, which like the plate 8, is secured detachably to said hangers by short pieces of angle-bars 3 bolted to both. This cutting-plate has a depressed part 2 with arc-shaped cutting edge formed with the same radius as that of a hollow cylindrical tile 17, and said cutting-plate is removable, which permits substitution of a cutter 2 of a different radius of curvature.

The forward parts of said hangers are braced and supported by traction-bars 5 which are fastened to the sub-frame by bolts 7, and to the hangers by bolts 6, and these bars 5 are offset outwardly at 16 to clear the side-cutting blades 15 of the rotary excavator 13.

The cutting-plate 1 is positioned near the blades 14 of said excavator 13, and is drawn forward therewith to cut a shallow longitudinal trough *c* in the bottom *b* of the trench *a*, to fit the curvature of the alined hollow cylindrical tiles 17. Fig. 4 diagrammatically illustrates the advantage incident to seating tile 17 in a curved trough *c* cut in firm soil *b* as compared to placing it upon the flat bottom *b* alone. In the latter method of seating the tile, soft earth filling deposited about the tile does not sufficiently reinforce it against strains which tend to break it along the longitudinal line of its contact with the hard surface *b*. Where a trough *c* is supplied, the strain is taken up by the considerable extent of surface sup-

ported by the trough, so breakage is prevented, and the tile kept in longitudinal alinement.

Various modifications in the device are covered by the principle of my invention.

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

In a ditching machine, trench excavating mechanism mounted on a traveling frame, and a follower-groover mounted on said frame comprising forwardly inclined laterally-spaced hangers, a forwardly-inclined receiving-plate mounted between said hangers and terminating short of the lower ends thereof, and a removable cutting-plate mounted between the hangers and filling their interspace anterior to the receiving-plate, said cutting-plate having its forward transverse cutting edge medially depressed to provide an arcuate groover delivering into the receiving-plate.

Signed at Waterloo, Iowa, this 7th day of August, 1919.

ALBERT BRAMER.