L. Thorn.

Excavator.

No. 975.

Patented Oct. 10, 1838.

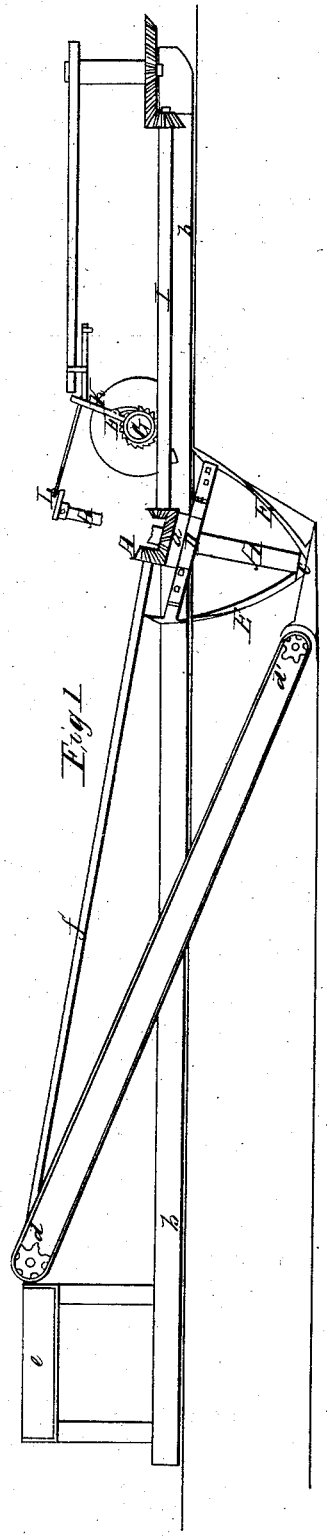

Fig. 1.

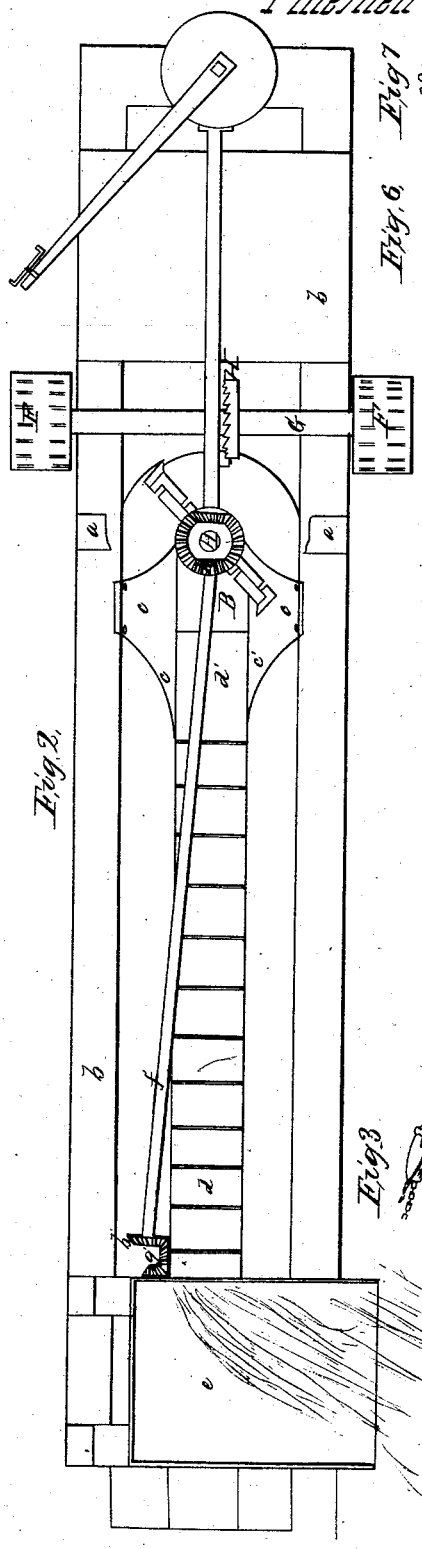

Fig. 2.

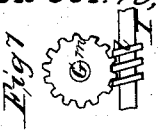

Fig. 7

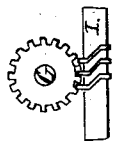

Fig. 6

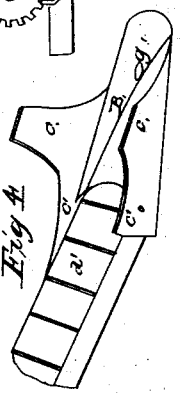

Fig. 4

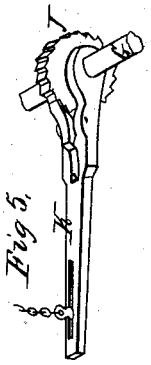

Fig. 5.

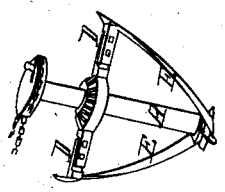

Fig. 3

UNITED STATES PATENT OFFICE.

LINTON THORN, OF WASHINGTON, DISTRICT OF COLUMBIA.

MACHINE FOR DITCHING AND EMBANKING.

Specification of Letters Patent No. 975, dated October 10, 1838.

To all whom it may concern:

Be it known that I, LINTON THORN, of the city of Washington, District of Columbia, have made certain Improvements in Machines for Forming Ditches and Embankments in Prairie and other Grounds; and I do hereby declare that the following is a full and exact description thereof.

In the accompanying drawing Figure 1, is a vertical section, Fig. 2, a plan of my proposed machine, and Fig. 3, a perspective view of the cutters.

Like parts are designated by the same letters of reference, in all the figures.

A, in Figs. 1, 2, and 3, is a shaft, upon the arms of which D, D, and a bottom disk C, the knives are affixed; this shaft is either placed vertically, or making an acute angle with a vertical line; its upper end revolves in a collar, in the cross piece *a*, of the frame *b*, *b*, and the lower end in a step formed in a sole piece or shoe B; or it may run in two collars, by producing the shaft A, so as to extend it up to a second collar in the frame work of the machine. From the bottom disk C, to the arm, or cross bar D, one, two, or more knives, or cutters E, E, extend in such a direction as shall cause them to cut the earth, with the greatest facility; it being intended to curve them spirally for that purpose, and sloping them from the arm D, to the disk, C, so that in revolving they shall describe part of an inverted cone; but they may be either curved, or straight, as I do not confine myself in this particular, but use them in either, or both forms, being governed by the soil to be operated upon. The cross bar D, may be so constructed, as to expand, or contract, as it may be desired to increase, or lessen the width of the ditch. The shoe B, is kept firmly in its place, by the braces *c*, *c*, which may be so curved on their edges *c' c'*, as to run a sufficient distance along the apron *d'*, *d*, to serve as guides to the earth and prevent it falling over the sides of the apron at the commencement of its upward passage. The shoe B, and the braces *c*, *c*, are shown in Fig. 4.

g, is a socket to receive the journal of the shaft A.

The earth, as it is cut falls upon an elevating apron *d'*, *d*, and is raised and thrown on the side of the ditch, by the aid of an inclined chute, or apron *e*, as shown in the drawing. The apron *d'*, *d*, may be constructed in any of the known ways, adapted to the purpose herein set forth. The upper end of the apron *d*, must be elevated three or four feet above the surface of the ground, in order that the lower end of the chute *e*, may rise as high above the top of the bank to be formed. The elevating apron is driven by the shaft *f*, extending from the wheel *h*, meshing into a bevel gear wheel on the head of the shaft A, and at the opposite end having a wheel *i*, which meshes into the bevel gear wheel *g*, attached to the upper or propelling roller. Instead of this gearing for revolving the apron, an endless chain, or band, may be substituted, as either may be found to answer the purpose.

The shaft A, is driven, and the machine made to advance, by means of the shaft I, which is operated upon, by gearing attached to the vertical shaft, to which the sweep is attached, when propelled by horse, or other animal power. The frame of the machine moves along upon the ground, or upon a temporary way, formed by placing loose planks upon the ground for this purpose it may be sustained by wheels F, F, which may have spurs, or points, on their peripheries, to bear upon the ground, or on temporary ways laid to sustain the pressure of the machine. To the axle G, I sometimes affix a toothed wheel H, which is operated upon intermittingly by the segment of an endless screw, or an inclined projecting piece on the shaft I, for the purpose of causing the machine to advance; which it is to effect when one of the knives E, is going out of, and the other going in operation, or the machine may be made to advance by the action of an endless screw *l*, Fig. 7, upon the wheel *m*, on the axle G. Another method for advancing the machine, which I mean sometimes to adopt, is to affix on the axle G, a ratchet wheel J, Fig. 5, with a forked lever K, embracing the axle G, which serves as its fulcrum. Attached to the lever, is a pawl, or pawls, which acts upon a ratchet wheel causing it to turn when the lever is raised, and forcing the machine to advance in proportion to the sweep given to the lever. This lever may be acted upon, by a crank, or cam L, upon the lever K, as shown in Fig. 1, or in various ways, dependent upon the motion of the machine. I do not intend to confine myself to the method represented in Fig. 1, of operating the lever K, but to adopt any other that I may find to answer the purpose best, so as to produce its effect

at the proper moment. An endless or drunken screw Fig. 6, formed upon the shaft I, and operating upon the axle G, may produce the same effect; the whole inclination of the thread being given at a particular part of its circuit. I have not given any particular proportions of the respective parts of the machine, as this must depend upon the judgment of the machinist, who will adapt it to the nature of the soil, and the size of the ditch to be formed. A ditch four feet wide at the top, three feet deep, and eighteen inches wide at the bottom, will I believe, be most generally preferred.

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

1. The construction and manner of operating the within described apparatus for ditching, or excavating the ground; that is to say I claim the arrangement of the cutters as described, attached to, and carried by, a vertical, or nearly vertical, shaft, and forming in their revolution the frustum of an inverted cone, the sides being sloped in any degree which may be desired.

2. I claim likewise, the advancing of an excavating machine as it cuts the ground by means of an endless screw, operating regularly, or by an intermitting motion produced by the irregularity of the thread of the screw, as herein set forth.

3. I also claim the giving of an intermitting motion to such a machine by means of the toothed wheel H, or by a ratchet wheel, combined and operating substantially as herein set forth.

LINTON THORN.

Witnesses:
C. H. WILTBERGER,
HY NAYLOR.