[3.] # J. F. Hanna. Grading & Ditching Mach^e.

No. 119,353. Patented Sep. 26, 1871.

Fig. 1.

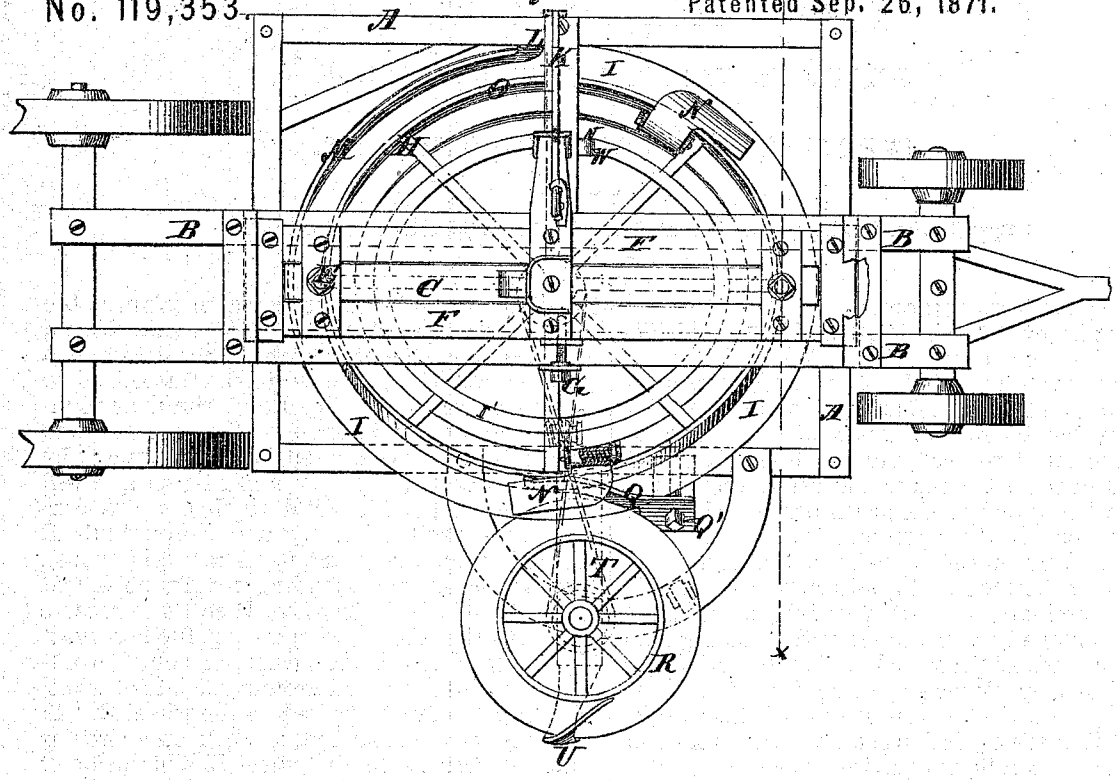
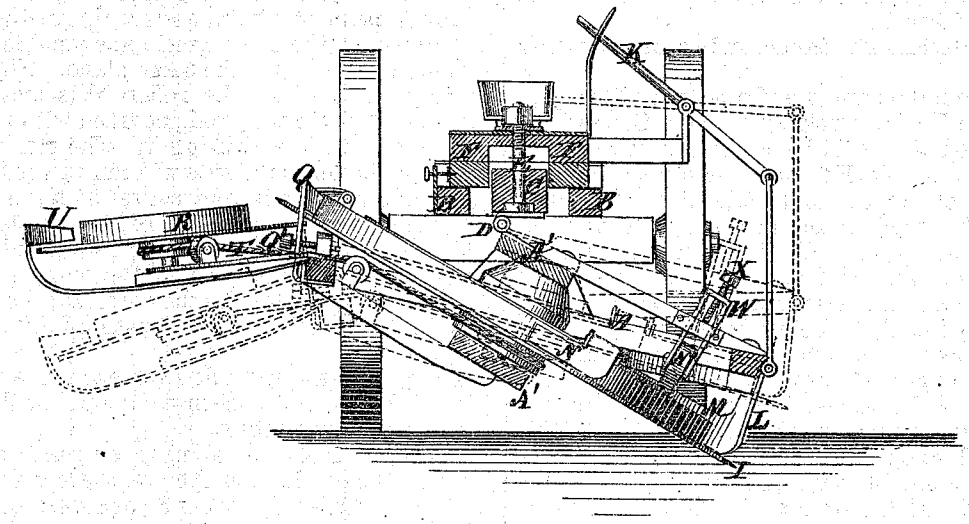



Fig. 2




**Witnesses:**

John Becker.

Wm. H. C. Smith.

**Inventor:**

J. F. Hanna.

Per Munn & Co.

**Attorneys.**

# UNITED STATES PATENT OFFICE.

JOHN F. HANNA, OF MOMENCE, ILLINOIS.

## IMPROVEMENT IN GRADING-MACHINES.

Specification forming part of Letters Patent No. 119,353, dated September 26, 1871.

*To all whom it may concern:*

Be it known that I, JOHN F. HANNA, of Momence, in the county of Kankakee and State of Illinois, have invented a new and Improved Ditching and Grading-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in machines for ditching and grading; and it consists in the hereinafter-described arrangement of devices employed, in connection with a cutting-and-elevating wheel arranged obliquely under the frame, of a truck for gathering the earth at the lowest side and elevating it to the highest side, where it is either discharged upon the ground or onto another oblique carrying-wheel.

Figure 1 is a plan of my improved machine, and Fig. 2 is a transverse section taken on the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A is a broad rectangular frame suspended from the frame B of a truck by a beam, C, to which it is hinged at D, said beam being suspended by the adjusting-bolts E from a long frame, F, placed on the top of frame B, and made adjustable crosswise of the truck-frame, and provided with an adjusting-screw, G. H is the cutting-and-elevating wheel mounted between two bars, A′, of the frame A, and having a broad sharp-edged flange, I, of steel, for being forced into the earth obliquely as the truck is moved along the ground with the flange I let down at one side of the truck so low as to be forced into the ground as the wheel turns by the friction of the contact with it. The flange is let down with the frame more or less by a hand-lever, K, suitably arranged and connected with the frame. L is a fixed cutter or colter, attached to the frame so as to cut a slice of earth from the bank above the flange on which it is to be carried up. The colter has a curved part, M, extending along the curved line described by the periphery of the flange, about half-way to the upper side, to hold the earth thereon; and as a further means of confining the earth on said flange the wheel is provided at suitable intervals with holding-plates N, hinged to the wheel above the rim O, so that the overhanging parts will rest on the earth taken on the flange and confine it there. Q is a scraper fixed at the upper side of the wheel, consisting of a curved plate of steel fixed to the frame, and so arranged with the flange I and rim O as to arrest the earth and throw it off. It is made to bear with more or less tension on the rim O by the set-screw Q′. The point of this scraper will pass under the holders and lift them up so as to scrape the earth off freely and thoroughly. R is another obliquely-arranged carrying-wheel, mounted on an arm extending from frame A, and arranged relatively to wheel H so as to receive the earth therefrom and convey it further away. This wheel R is turned by a cord or belt, T, working around its hub and around the hub of wheel H. U is a scraper applied to the wheel R. N′ is a presser-roll arranged to work on a circular track, I′, formed on the wheel H and inside of the cutter-flange I, but concentric therewith. This serves to keep the flange I down at the greatest point of strain, assists in causing it to cut always at the same depth, and enables it to revolve constantly in the same plane. The supporting-frame W for the roller N′ is made adjustable on the frame, and provided with the adjusting-screw X for shifting it. The rear truck-wheel on the left-hand side will run in the furrow cut in advance of it, and serves as a guide for the machine. The breadth of the cut is governed by adjusting the frame F laterally by the screw G, and the obliquity of the bottom of the furrow, which will also be the bottom of the ditch, will be governed by the adjusting-bolts E and the lever K.

The machine will work from each side of the "land" described by the first "round" of the machine toward the center.

For digging ditches alongside a road and delivering the earth upon the bed thereof this improved machine will be found to possess especial adaptation.

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

1. The cutting-and-carrying wheel H mounted on the hinged frame A when the latter is suspended from the laterally-adjustable frame F by the vertically-adjusting bolts E and beam C, all substantially as specified.

2. The arrangement, obliquely to the earth, of the annular rotary cutter I, and, at right angles

thereto, the correspondingly-shaped stationary cutter L, as and for the purpose described.

3. In combination with cutters I L arranged as described, the curved plate M and rim O, to guide the soil, as set forth.

4. The annular cutter-flange I, rim O, and extension M of stationary cutter L, combined with pressure-plates N placed at intervals, as and for the purpose specified.

5. In combination with cutters I L and rim O, the scraper Q, obliquely arranged to discharge the dirt as described.

6. In combination with rim O, annular cutter I, and scraper Q, the rotary dirt-receiving-and-discharging wheel R, arranged as described.

7. The arrangement of the roller V and circular track I′ upon the hinged frame and wheel H, respectively, to hold the flange I near that part of the edge which is cutting out the soil.

JOHN F. HANNA.

Witnesses:

FARMON SCRAMLIN,

HARLEY J. BALLARD.