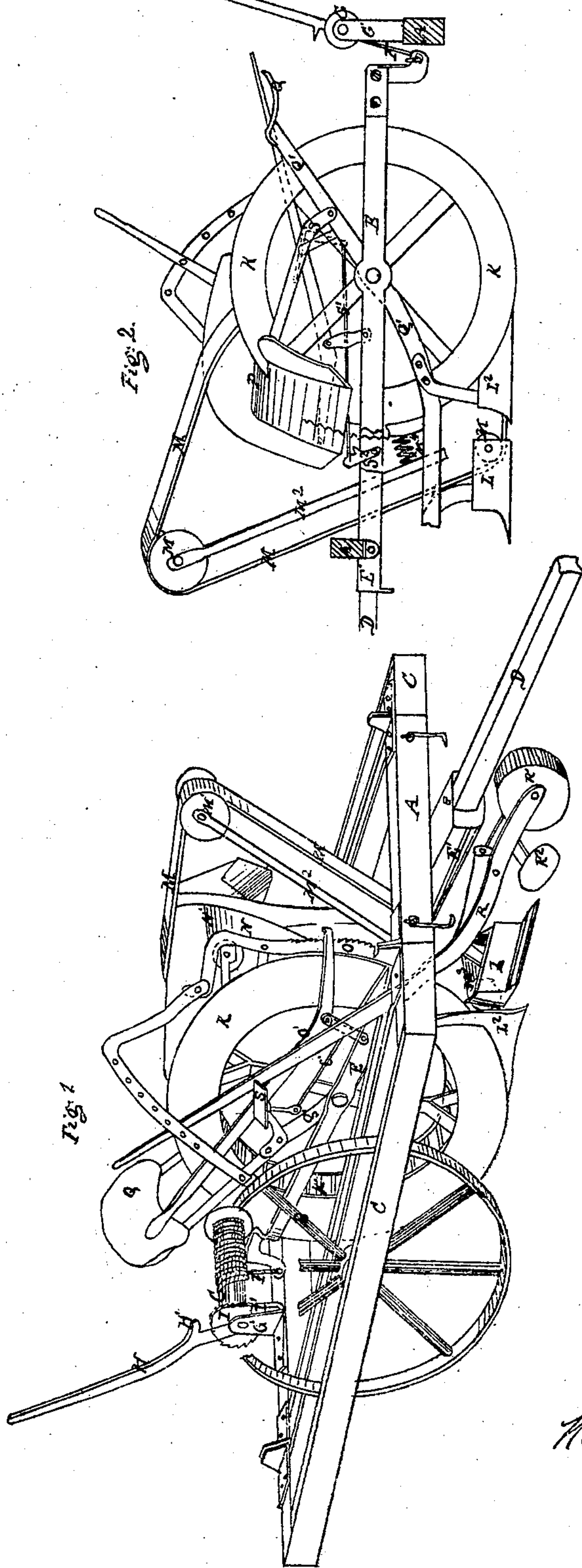


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Patented Dec. 17, 1867.



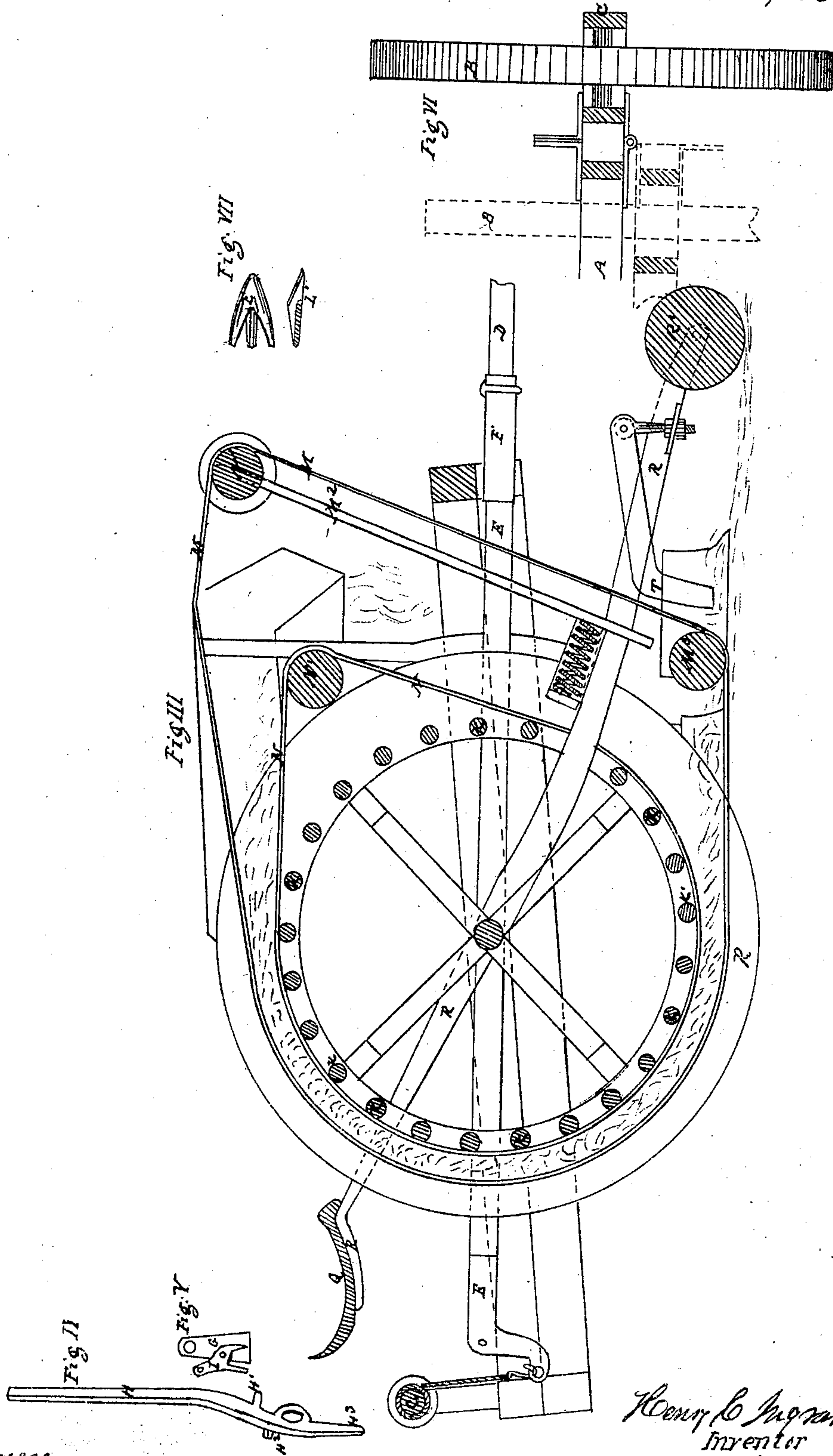
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UNITED STATES PATENT OFFICE.

HENRY C. INGRAHAM, OF TECUMSEH, MICHIGAN.

IMPROVEMENT IN DITCHING-MACHINES.

Specification forming part of Letters Patent No. 72,399, dated December 17, 1867.

To all whom it may concern:

Be it known that I, HENRY C. INGRAHAM, of Tecumseh, in the county of Lenawee and State of Michigan, have invented a new and useful Improvement in Ditching-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view. Fig. 2 is a side elevation, partly in section. Fig. 3 is a vertical longitudinal section. Fig. 4 is an elevation of the raising-lever. Fig. 5 is an elevation of the pawl for the raising apparatus. Fig. 6 is a vertical section, showing the mode of reversing the wheel. Fig. 7 is a plan and section of the shoe.

The same letters are employed in all the figures in the designation of identical parts.

This invention relates to certain improvements, hereinafter set forth, on the ditching-machine invented by me, as set forth in Letters Patent issued to me, bearing date October 23, A. D. 1866, to which reference is hereby made.

The improvements consist in, first, the construction of the wheel K, so as to leave open spaces between the bars uniting the flanges; second, in so arranging the driver's seat that his weight shall counterbalance that of the plow, &c.; third, in combining with the flanged wheel two revolving belts, between which the earth is elevated when loosened by the plow; fourth, in the mode of regulating the depth of the cut, and at the same time changing the set of the plow-point; fifth, in the substitution of the guides R² for the landsides in common use; sixth, in the mode of regulating the delivery of the earth excavated; seventh, the device for raising the machinery in turning, and also in that for raising the entire machine, except the wheels B; eighth, the use of an adjustable shoe for finishing the ditch to receive drain-tiles; ninth, in so constructing the frame that by folding it the tread of the wheels may be changed.

A is the main frame. It has hinged to each side a supplemental frame, C, formed by two end and two side pieces, and carrying the wheels B. The supplemental frames C are so hinged that they may be folded under the main frame, reversing the wheels, and changing the width of the track of the machine, so as to

be either that of an ordinary wagon, or increased sufficiently to permit the wheels to run outside of the earth thrown from the ditch.

D is the tongue, adjustably attached, so that it may be removed for convenience in packing the machine. The tongue is attached immediately to the frame E, which supports the operating mechanism, and is hinged to the under side of the main frame at E'. This frame may be raised and lowered by means of the cord F, attached to the end of the frame, and the axle G, which is operated in raising and lowering the machine by the lever H, attached to its shaft, which is supported upon the standards G'. On the axle is a ratchet-wheel, I, actuated by a projection, H², on the side of the lever H.

I' is a bifurcated pawl (see Fig. 5) pivoted to the standard G'. This pawl is alternately attached and detached by the projection H' and end H³ of the lever. The frame may be raised or lowered by the lever H.

K is a wheel formed by two parallel flanges united by bars K', and turning on an axle passing through the frame E.

L is a plow running in front of the flanged wheel K, with double mold-boards, by which the earth is loosened and thrown to the sides, where it is caught by the side wings, L², and then turned toward the center of the furrow, and upon the upper face of the endless belt M, which revolves with the wheel K, passing around the wheel and under the pulley M³, placed between the mold-boards, and over the pulley M', attached to the adjustable arm M², which is hinged to the frame E and pressed against the belt and away from the wheel by the tightening-spring M⁴. Another belt, N, passes around the wheel, fitting closely against the rods or bars K', and is carried in front of the wheel above, so as to deliver the earth carried up between the two belts into the slide P, by which it is directed so as to fall upon the side of the ditch. As the ditcher passes several times along the ditch in opposite directions, the earth will be alternately deposited on each side of the ditch. The belt N passes over the pulley N'. The braces O are notched on the edge to receive the hooked end of the lever O', by which the plow-frame may be raised from the ground to turn around the machine.

Q is the driver's seat, placed in rear of the flanged wheel and supported upon braces, which, pivoted upon the axle of the wheel K, extend downward, and are attached to the plow-frame so that the weight of the driver shall nearly or entirely counterbalance the weight of the plow and plow-frame.

R is a lever pivoted to the frame in front of the plow and attached to the axles of the wheels R'. By means of this lever and wheel the depth of the cut is regulated.

R² are guides which direct the plow.

The frame having been raised by the lever O', as described, is sustained by a pawl, S², working into the notched brace O. This pawl may be detached by means of the foot-lever S, connected therewith by the rod S'. The plow is suspended by the lever T, which is pivoted at the elbow to the plow-frame, the hinged rod T' being adjustably attached to the lever R in front of the pivot, where it is pivoted to the plow-frame, so that as the plow is raised by the lever, the point of the plow is thrown down, and vice versa, so as to make less draft on the beam-frame when plowing deep, and to give a better action to the plow when plowing shallow.

The shoe L' is attached to the point of the plow for the purpose of making a round bed for drain-tile when the ditch is finished. It is attached only when needed for this purpose.

Scrapers are attached at suitable points on the frame and other parts of the machine, to scrape off the earth adhering to the pulleys over which the belts pass, from the belts themselves, and from the bars uniting the flanges of the wheel K.

The slide P is formed in two parts, sliding one over the other, so that the first earth raised may be deposited nearest the wheels, and as the ditch is deepened the slide may be shortened to deposit the earth nearer the ditch.

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

1. The wheel K, when constructed with parallel flanges, united only by bars K', substantially as set forth.

2. So connecting the driver's seat Q with

the plow and frame by means of the rods Q' that the weight of the driver and mechanism behind the axle shall counterbalance that placed in front of the axle, substantially in the manner set forth.

3. The combination of the flanged wheel K with the belts M and N, between which the earth is elevated, substantially as set forth.

4. The combination of the plow L, wings L², belts M and N, and wheel K, substantially as set forth.

5. The combination of a flanged wheel, K, with bars K' and intermediate open spaces, with the carrying-belt N, substantially as set forth.

6. The combination of the lever R, wheel R', plow L, lever T, and rod T', substantially as and for the purpose set forth.

7. The combination of the plow with the guides R², substantially as set forth.

8. In combination with the wheel K, the adjustable extension-slide P, substantially as set forth.

9. The combination of the notched frame O, lever O', pawl S², rod S', and foot-lever S, substantially as set forth.

10. The combination of the lever H, axle G, ratchet-wheel I, and pawl I', said parts being constructed substantially as and for the purpose set forth.

11. In combination with the plow L, the adjustable shoe L', substantially as and for the purpose set forth.

12. The combination of the flanged wheel K, belt M, hinged arm M², pulley M', and spring M⁴, arranged to operate substantially as set forth.

13. So constructing the main frame that the wheels may, by folding the parts of the frame, be adjusted to a wider or narrower tread, substantially in the manner set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY C. INGRAHAM.

Witnesses:

WM. A. MCKENNEY,
J. MCKENNEY.