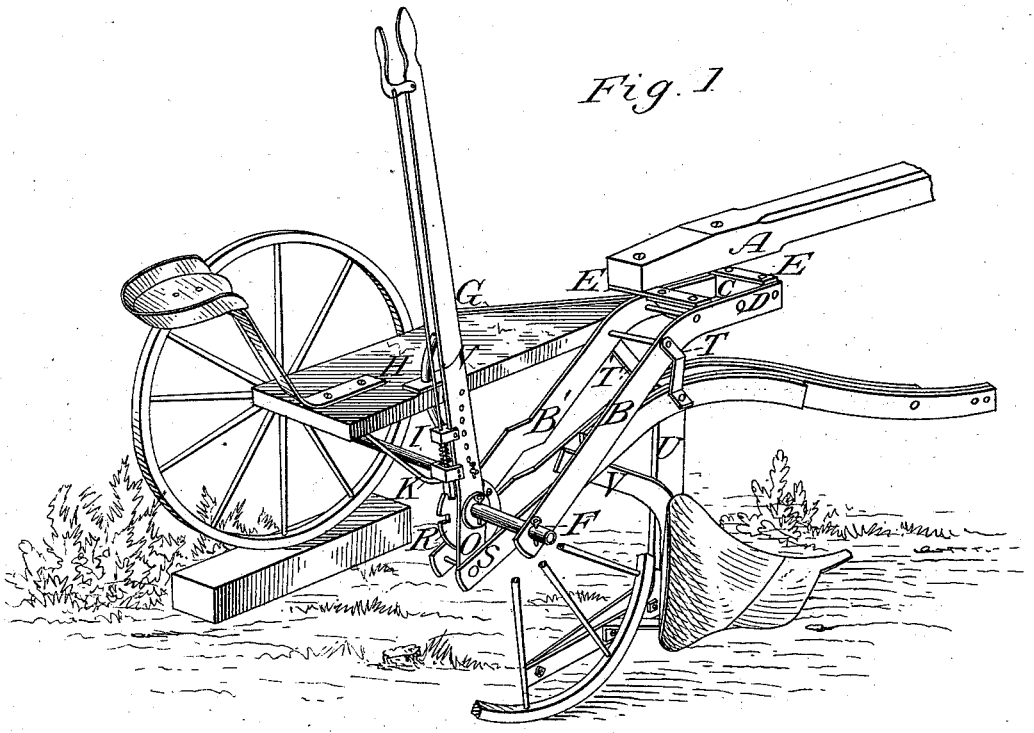
E. W. NEWTON.
Sulky-Plow.

No. 216,442. Patented June 10, 1879.

Fig. 1



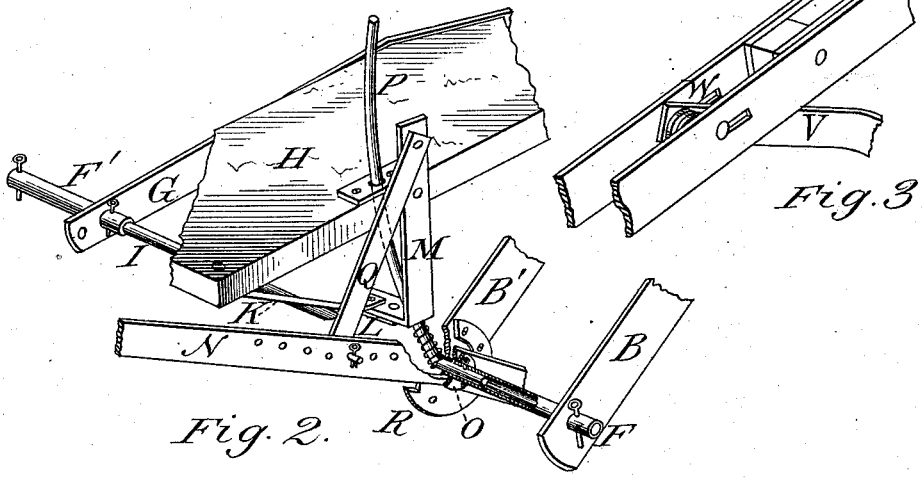


Fig. 2.

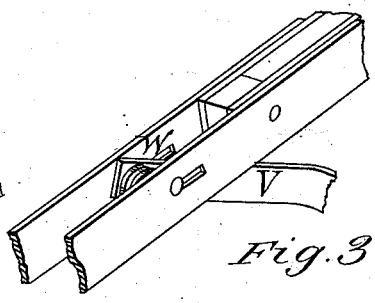


Fig. 3.

Attest;
John D Sitts
Shelby W. Kaiser

Inventor:
Edwin W. Newton.

UNITED STATES PATENT OFFICE.

EDWIN W. NEWTON, OF FRANKLIN GROVE, ILLINOIS.

IMPROVEMENT IN SULKY-PLOWS.

Specification forming part of Letters Patent No. **216,442**, dated June 10, 1879; application filed January 9, 1879.

To all whom it may concern:

Be it known that I, EDWIN W. NEWTON, of Franklin Grove, in the county of Lee and State of Illinois, have invented a new and useful Improvement in Sulky-Plows, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a perspective view of the sulky with the plow-bottom attached and the furrow-wheel partly broken away; Fig. 2, a perspective view of the axle and leveling device with parts broken away; and Fig. 3 is a perspective view of a part of the plow-beam and standard-brace.

The object of my invention is to furnish a sulky or riding plow which shall be light and cheaply made, and shall carry the plow directly in front of the furrow-wheel in such a way as to balance its weight against the weight of the frame and driver when leveling the frame, and to enable the driver to throw it into and out of the ground very quickly and easily.

The sulky-frame consists of two parts, which act independently of each other, one part carrying the plow and the other the driver. The part which carries the plow consists of the two flat bars B B′, Fig. 1, bent near the forward end, as shown in the figure, and bolted together with an intervening cast-iron tool-box, C. This tool-box consists of a bottom and two flaring ends with horizontal projecting flanges at the top. When bolted up the flat bars B B′ form the sides of the tool-box, and the casting is held in place by the middle bolt, D, Fig. 1, which passes across the inside and on the bottom of the casting or box, and the two end bolts, which pass outside of the box, under and against its flaring ends. To the flanges of the tool-box are bolted two short flat bars, E E, as shown in Fig. 1, which carry the tongue A.

The tongue is shown in the drawings in the proper position for using two horses. When three are to be used, by turning the bars E E around, the tongue may be shifted to the right-hand side of the frame.

The bars B B′ have holes at the back end, through which is passed the axle or spindle F of the furrow-wheel, which stands between the bars B B′. Thus the bars B B′ and the tongue A form a rigid support, reaching from the axle to the neck-yoke, beneath and suspended from which the plow is carried.

The other part of the frame consists of the flat bar G, Figs. 1 and 2, which is held at its forward end by the left-hand end of the bolt D, Fig. 1, and extends backward and downward to the axle, as shown in Fig. 2, together with the foot-board H and axle-bar I, Figs. 1 and 2. The foot-board H is bolted at its forward end to the bar G, and at its back end is carried a few inches above the axle upon the brace K, one end of which is bolted to the axle at L, Fig. 2, and the other to the back end of the bar G, Fig. 2.

The bolt D, which fastens the front ends of the two parts of the frame together, allows a free vertical movement of the back ends independently of each other, since the axle is in two parts, as shown in Fig. 2. In Fig. 2 the left-hand part of the axle is shown bent upward a little, and bolted at L to the foot of the brace K, and also to the horizontal foot of the bar M, which is also bolted to the foot-board H. The part of the axle which supports the bars B B′ is also in two parts. The first or spindle part, F, Fig. 2, is a piece of gas-pipe, which passes through the bar B, the hub of the furrow-wheel, the washer O, the lever N, and abuts against the bar B′. The other part is the horizontal foot of the guide-bar P, which passes through the bar B′ and a few inches into the pipe-spindle F, to which it is fastened by the linchpin by the side of the washer O, Figs. 1 and 2.

The upright part of the guide-bar P passes through a guide-hole in the foot of the bar M and another guide-hole in a plate bolted to the foot-board H, as shown in Fig. 2. The object of this guide-bar is to prevent any lateral movement of the two parts of the frame with reference to each other, and to allow a free movement vertically when the furrow-wheel drops into the furrow.

The upright part of the guide-bar is bent to a curve whose radius is the distance between the center lines of the axle F and bolt D, so as to accommodate the movement of the parts of the frame upon the bolt D as a center. The amount of vertical movement in leveling the frame is determined by the position of the bar Q, Fig. 2, which is bolted to M at its up-

per end, and has a wrist-pin at its lower end, which passes through one of the holes shown in the lever N, and is fastened by a split key, as shown in Fig. 2. These holes in the lever N are arranged in a curved line whose center of curvature is the bolt in the upper end of the bar Q, so that when the lever is thrown back into the position shown in Fig. 2 the wrist-pin may be placed in any one of the holes, and the sulky-frame will then be level.

The sulky-frame is made to run level at any given depth of furrow by placing the pin in the corresponding hole in the lever, for when the lever is thrown up into the working position, as shown in Fig. 1, it lifts the land-side of the frame to a height which is determined entirely by the position of the hole which the pin is in.

There are but two positions in which the lever can be locked fast. These positions are determined by the notches in the circle R, Fig. 1, which is riveted fast to the bar B′. In Fig. 1 the lever is in the position for holding the plow down in the ground, and in Fig. 2 it is in the position for holding the plow up out of the ground ready for turning around or driving on the road.

The lever is prolonged downward below the axle to receive the bolt S. (Shown in the back end of the beam of the plow, Fig. 1.) The plow is also suspended from the frame by the two braces T T′, Fig. 1. The brace T′ is made nearly straight, while the other one, T, is bent so as to swing the beam nearly under the frame-bar B′, so as to bring the beam to the left of and out of the way of the furrow-wheel.

The braces T T′ are inclined backward, and are about twice as long as the lower arm of the lever, which stands vertically when the plow is in the ground.

The relative positions of the lever-arm and the braces T T′ make it evident that while all parts of the plow must rise when the lever is thrown back, the point will rise very much more rapidly and much higher than the heel, thus making it possible to throw the plow out of the ground very quickly and easily.

When throwing the plow into the ground, the lever is pushed forward of the upper notch, so as to raise the heel above the bottom of the furrow-wheel and pitch the plow steeply downward with the point several inches below the furrow-wheel. In both of these movements of the lever the driver is assisted by his own weight and the weight of the land-side of the sulky-frame, for since when the lever stands upright, as in Fig. 1, the bar Q stands directly over the axle, it is evident that when the lever is thrown backward this weight is a direct counter-balance to the weight of the plow, and when the lever is thrown forward this weight bears forward also and assists in forcing the point of the plow into the ground. When the driver has thrown the plow into the ground he has only to let go of the lever, and the up-draft of the horses upon the end of the beam immediately throws the lever back to its upright position, where it fastens in the usual way with a spring-catch; but usually the part of the weight of the driver and of the frame transmitted through the bar Q to the lever will somewhat exceed the weight of the plow. To counteract this excess of backward pressure, a short coiled spring is placed on the guide-bar P, under the foot of the bar M, as shown in Fig. 2, so as to take a part of the weight off from the lever as it approaches its lowest position. It is to give room for this spring that the axle I is bent up a little at its right-hand end. The axle or spindle of the furrow-wheel is made in two parts to allow a ready removal of the wheel, for by removing the linchpin which fastens the pipe on the guide-bar the pipe may be drawn out of the hub and the bar B, leaving the wheel free.

The spindle F′ of the land-wheel is also made by slipping a piece of gas-pipe on the end of the axle-bar I, and fastening with a linchpin, as shown in Fig. 2, to allow of cheap renewal when worn.

This plan of supporting the plow in front of the furrow-wheel obliges a peculiar construction of the beam. First, the beam must be prolonged back far enough to bolt to the foot of the lever and give it control of the up-and-down movements of the plow, as explained above; second, the connection with the lever must be such that the plow can, to a limited extent, turn horizontally in the lower end of the braces T T′, or else in plowing round corners, or in turning to the left, the plow would be crowded so hard against the wall of the furrow as to slide the wheels to the right. The braces T T′ fit loosely enough to allow this turning movement.

An open beam is used, made either of two long bars or preferably of shorter and lighter ones, bent to the shape and bolted together, as shown in Fig. 1. Two of the bars are prolonged back and separated several inches to receive the long bolt S, Fig. 1, which passes through the lower end of the lever.

When the plow runs straight forward the pressure of the furrow-slice against the mold-board keeps the right side of the beam firmly against the lever, as shown in Fig. 1; but in turning to the left the side pull of the team upon the plow causes the bolt S to slide through the lever, making the horizontal movement perfectly free while the plow is still held firmly down to its work.

The plow is gaged for the depth and width of its cut entirely by the clevis, which is bolted to the end of the beam, as in walking-plows. But when a plow is properly set for two horses three cannot be used without its showing a strong tendency to side draft, for the tongue must be shifted to the right to give room for the middle horse, and the whiffletrees must be shifted to the opposite end of the clevis to avoid giving the plow too much land or width of cut, and vice versa, in changing from three to two horses. Consequently, if the land-side of the plow is paral-

lel to the line of draft in the one case, it cannot be in the other, and the plow runs more or less sidewise.

A remedy for this difficulty is provided in my sulky in the plan of attaching the plow to the beam. The standard U, Fig. 1, at its upper end is made thinnest on its edges, and the hole in the standard for the large bolt through the beam and the braces T T′ is widened a little horizontally, so that the standard can turn a little in the beam, and the point of the plow be thrown either to or from the land, according to the position in which the brace V is fastened.

In Fig. 3 a part of the beam is shown with its inside bars ending just in front of the upper end of the brace V, and all four bars of the beam bolted together with an intervening washer of the thickness of the standard U. Enough thin washers are placed on the bolt which fastens the brace V to the beam to fill up the space by the side of the brace, as shown at W, Fig. 3. It is evident that by transferring washers from one side of the brace to the other the land-side of the plow may easily be made parallel to the line of draft, no matter on which side of the frame the tongue may be placed.

More than this is gained by the use of the washers, for the plow may always be set so as to carry the heel of the land-side just free of the furrow-wall, and so diminish friction by transferring the side pressure of the plow to the wheels.

The brace V is slotted lengthwise where it is bolted to the beam, as are also the bars of the beam, as shown in Fig. 3 at W. Evidently by sliding the bolt forward in these slots the heel of the plow in Fig. 1 will be lifted up, and the point or cutting-edge of the share lowered correspondingly. This vertical adjustment of the point of the plow is rendered necessary partly by the fact that as a plow-point wears dull and shorter the cutting-edge rises and gives the plow a tendency to run shallower, but chiefly by the relation of the cutting-edge of the plow to the bottom of the furrow-wheel. In soft ground the wheel will cut into the furrow-bottom a little, and the plow should be set level, so as not to run any deeper in consequence; but when the ground is hard the wheel will not cut down any, and the heel should be raised and the point lowered a little, so that the plow will have sufficient downdraft.

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

1. The two-part sulky-frame joined in front by the pivot-bolt D and at the back end by a curved guide-bar, P, one part carrying the driver and the other the plow, substantially as shown and described.

2. The combination of the curved guide-bar P with the connecting-bar Q and the lever N, fitted with a set of holes arranged in curved line, for the purpose of leveling the sulky-frame, all substantially as shown and described.

3. The combination of the short lever-arm with the long and highly-inclined braces T T′, for the purpose of causing the point of the plow to rise much faster than the heel when coming out of, and drop much faster than the heel when going into, the ground, substantially as shown and described.

4. The combination of the prolonged open beam, the bolt S, and the lever N, to let the plow turn horizontally and adjust itself to the line of draft in turning, substantially as shown and described.

EDWIN W. NEWTON.

Witnesses:
JOHN D. SITTS,
SHELLY W. KEISER.