2 Sheets—Sheet 1.

M. J. FREEMAN.

Sulky-Plow.

No. 211,626. **Patented Jan. 28, 1879.**

FIG. 1.

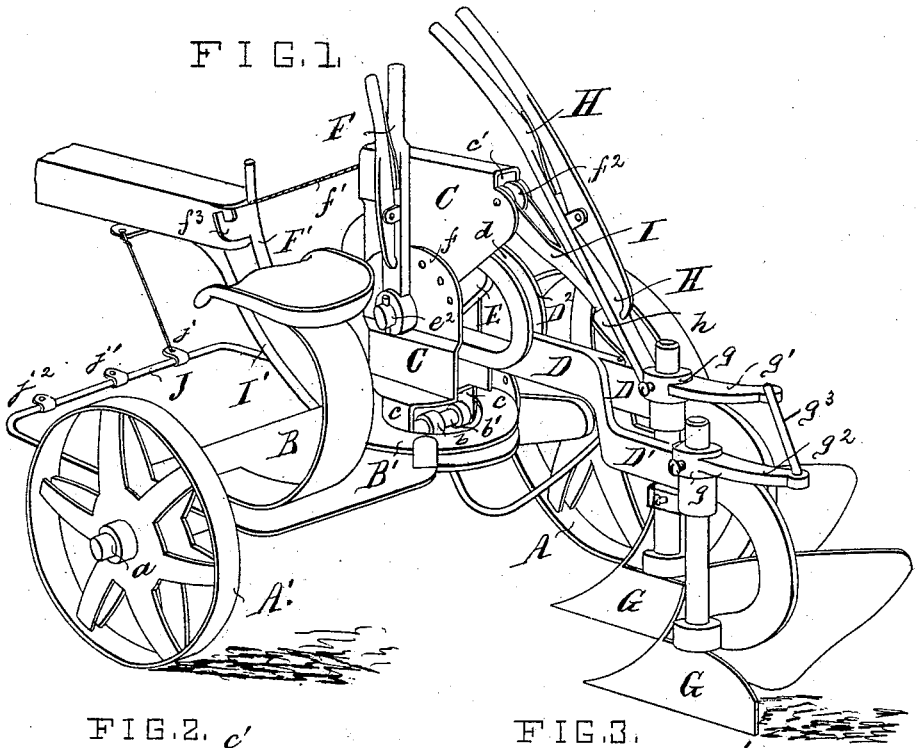

FIG. 2.

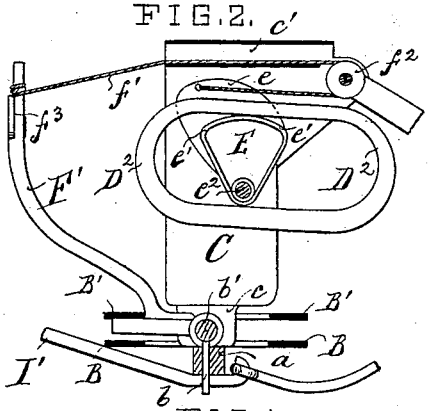

FIG. 3.

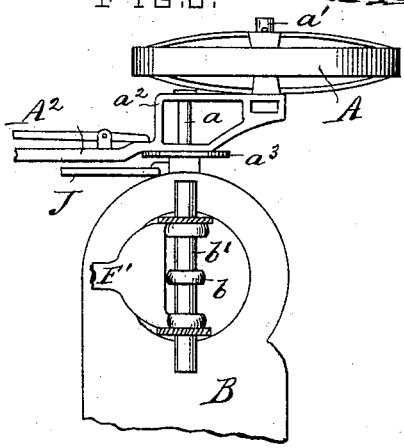

FIG. 4.

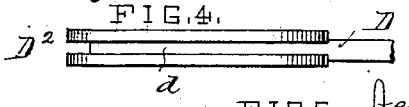

FIG. 5.

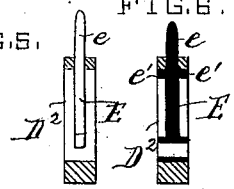

FIG. 6.

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FIG. 7.

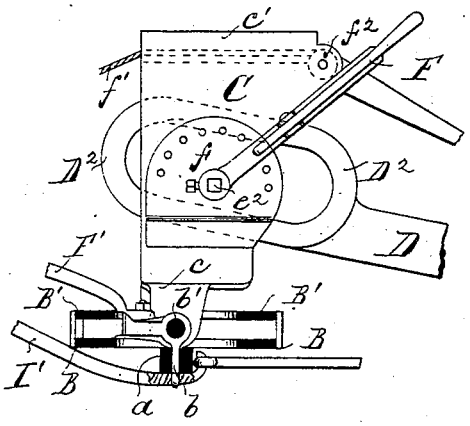


FIG. 8.

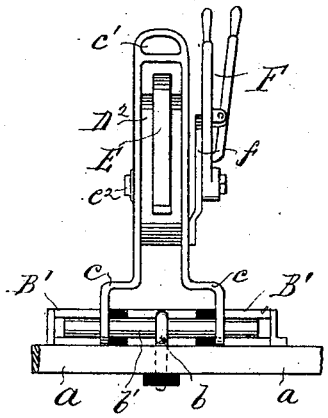
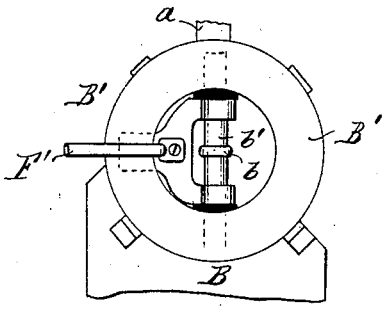


FIG. 9.



ATTEST.

John. W. Herthel.
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per
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UNITED STATES PATENT OFFICE.

MAX J. FREEMAN, OF WALLA WALLA, WASHINGTON TERRITORY.

IMPROVEMENT IN SULKY-PLOWS.

Specification forming part of Letters Patent No. **211,626**, dated January 28, 1879; application filed October 21, 1878.

To all whom it may concern:

Be it known that I, MAX J. FREEMAN, of Walla Walla, Washington Territory, have invented an Improved Gang-Plow, of which the following is a specification:

The object of this invention is to form an improved gang or sulky plow, and by the use whereof subsoil, square, circular, side-hill, or ordinary plowing can be accomplished.

Of the drawings, Sheet I, Figure 1 is a perspective view of my improved gang-plow. Fig. 2 is an elevation of the parts that connect the plow-beam to a transverse shaft, the latter being shown in section between the bottom bed-plates; also, the yoke of the plow-beam is shown, containing the eccentric attachment by means whereof the plow-beams can be raised or lowered. Fig. 3 is a detail plan view of the crank-axle, also bed-plates containing the transverse shaft. Fig. 4 is a plan view of the yoke-extremity of plow-beam. Figs. 5, 6 are detail views, the former being an elevation of the eccentric and yoke, the latter figure showing said parts in section.

Sheet II, Fig. 7 is a side elevation of the guide-frame containing the yoke; also the hand-lever to operate the eccentric is shown, the connection of the said guide-frame and its parts to the shaft below being shown in section; also, the pivotal connection of the main axle to said shaft is shown in section. Fig. 8 is a front elevation of the parts shown in Fig. 7. Fig. 9 is a detail plan view of the foot-lever connected to the transverse shaft.

I will first fully describe the construction and operation of my improved gang-plow, and hereinafter point out the novel features thereof.

A A^1 are the wheels; *a*, the main axle. The wheel A^1 simply turns on the axle. The wheel A turns on the sub-axle a^1, which forms part of the crank a^2, that turns upon the main axle. Secured to the crank is a hand-lever and spring-catch, A^2. (See Fig. 3.) Rigidly connected to the main axle is a segment-plate, a^3, having a series of holes or notches. In operating the hand-lever A^2 so that its spring-catch engages or disengages the segment-plate, the wheel A can be adjusted and secured in various positions to suit irregularities of surface-travel. By these well-known means the action of the plows can be retained on a level and in a proper manner.

B is the bed-plate, serving as a foot-rest, support for the operator, and support for the carriage that carries the plows. This bed-plate has an opening, through which the pivot *b* passes, and which is secured to a transverse shaft, *b'*. The bed-plate is rigidly secured to top of main axle.

B' is a top plate, having an opening in line with and like the one in the bed-plate, and both said plates are properly jointed or bolted together, leaving sufficient space between for the free movement of the transverse shaft *b'*.

The plow-truck, therefore, consisting of the bed and top plates, main axle, and wheel parts, as described, can freely turn or move sufficiently on the pivot *b* to answer the requirements of draft purposes; also, it can be here stated that the transverse shaft can turn independently between the two bearing-surfaces B B', and that without interfering with the action of the truck or draft. This shaft *b'* virtually constitutes the movable bearing to support the frame parts that carry the plows, and by means whereof the latter are capable of a part arc movement in a horizontal plane, a feature of great importance, and as will hereinafter appear.

C is an upright guide-frame, more specifically described. The frame consists of a plate bent into an inverted U shape, and having its lower ends or sides bent angular, to project as shown at *c*. The opposite sides of the frame C serve to guide the action of the parts contained inside. By its ends *c* said frame is rigidly connected to the transverse shaft below, as is more clearly shown in Fig. 8. The guide-frame C at top has the double faces, to form an open passage, *c'*, for the free movement of a cord or chain, f^1. The guide-frame C supports the plow-beams, plows, hand-lever, &c., as will hereinafter appear; also, inside said frame are contained the parts by means whereof the plows can be raised or lowered, and as will now be fully described.

D is the plow-beam, and jointed to it is the rear plow-beam, D^1, both plow-beams carrying the plows, as shown. The front plow-beam has its forward part made to form an oval-shaped

yoke-bar, D^2, the upper part of which has the slot or opening *d*. The oval opening presents its inner face as a shoulder for the bearing of a cam or eccentric, and the slot *d* permits the upper arm of said cam to pass through and guide same when in action.

E is this cam or eccentric, consisting of the arm *e*, the side shoulders or faces at e^1, and otherwise said cam in its entirety has the constructive shape shown in Figs. 2 and 8. The arrangement of the cam E is such that its arm *e* projects through the slot of the yoke-bar, while the inner cam-faces, e^1, bear against the oval face of said yoke-bar. (See Fig. 2.)

e^2 is the shaft that turns in the guide-frame C, and to which the cam E is fixed rigid.

F is a hand-lever, with spring-catch. Said lever is secured by a set-screw to the shaft e^2, so as to operate same, and consequently the cam. *f* is a notched or perforated segment-bar, for the engagement or disengagement of the hand-lever F. Thus, by operating the hand-lever F, the cam E can be adjusted or secured.

To the cam-arm *e* one end of a chain, f^1, is fastened, and this is passed over a roller at f^2, the other end of the chain being passed through the passage *c'*, and connected to the top of the foot-lever F'. (See Fig. 2.) The foot-lever has the foot-rest f^3, and the lower end of said lever is rigidly secured to the transverse shaft *b'*, so as to operate or partially turn same. (See Fig. 2.)

The plows G have their standards secured for vertical and lateral adjustments. Hence the said standards pass through proper collars on each plow-beam, and the upper end of each standard passes through the additional collars at *g g*, which form part of the arms g^1 g^2, the former of which is the lower part of a hand-lever, H. (See Fig. 1.) This hand-lever and spring-catch are fitted to engage a notched plate, *h*, secured to top of the plow-beam D. (See Fig. 1.)

Set-screws pass through such collars *g g* to engage the plow-standards and secure same firmly. The arms g^1 g^2 are connected by the rod g^3, so that both plows can be turned simultaneously by operating the hand-lever H. (See Fig. 1.) By, therefore, disengaging the set-screws, the standards and their plows are free to be turned or be adjusted vertically and secured in the position desired. By means of the hand-lever H, operating the arms g^1 g^2, each plow can be partially turned to the right or left laterally—a feature specially designed for plowing in a curve or circle.

I is a brace, to further strengthen the connection of the plow-beam with the guide-frame. (See Fig. 1.) The tongue is properly secured to a sub-tongue, I', which joins the bed-plate and axle, as shown in Figs. 1, 2.

J is a draft-bar, bent as shown, and having its ends properly connected to the main axle. To said draft-bar the draft-team can be hitched at the various points *j* j^1 j^2. (See Fig. 1.) Two horses abreast can be hitched at *j*, three horses at j^1, &c., to suit the various requirements of plowing.

My improved gang-plow is thus constructed to do various kinds of plowing. The operation thereof is as follows:

When the hand-lever F is adjusted backward and secured in a horizontal position the plows will have their greatest depth. By bringing this hand-lever perpendicular the plows will be level with the surface; adjusting the said lever entirely to the front in a horizontal position, the plows will then be completely raised above the ground. All the said movements are accomplished by the operator simply moving the hand-lever F, which turns the cam, and this draws its end of the chain nearer to the end that is secured to the foot-lever. Opposite action of the hand-lever F restores the plows to first position. Therefore, the operator, by raising or lowering the hand-lever F, can readily raise or lower the plows, gaging the depth of their action, and cause same to plow to suit the nature of the soil. By these means all the advantages in deep or shallow plowing can be had; also the usual motion of lifting the plows to pass over obstructions, &c.

Further, it will be noted that by means of the same hand-lever F the plows can be partially turned (either right or left) on the axis or transverse shaft *b'*, that supports the carriage parts. A side pressure on the foot-lever assists the operator to accomplish the horizontal movement of the plows just referred to. Hence by the same means the operator can turn the plows to take more or less "land," and accomplish plain plowing, also square or angular plowing.

For plain plowing usually no change is made excepting to raise or lower the plows, gaging their action. For plowing angular and square the hand-lever F is brought forward to a horizontal line, raising the plows out of the soil; next swinging the carriage carrying the plows in a horizontal plane, (right or left, as the case may be;) this done, readjusting the said hand-lever, and consequently forcing the plows to enter the soil precisely at the same place, and that without leaving ground unplowed.

To adapt the plow for subsoiling, raise the plow completely out of the ground, and bring the front plow in the furrow behind the right-hand wheel. The plow is next secured the required depth, and thus it will subsoil the old furrow, while the hind plow will make a common furrow for the next round and for the better travel of the draft-team. The draft should be such as to cause the wheel to the right to travel in the middle of the furrow.

Circular plowing is done by setting and securing the plows to make a uniform furrow. This can be accomplished by means of the hand-lever H, which is adjustably secured to the right or left; to the right to plow an outside curve, and to the left to make an inside curve. By means of the hand-lever H this kind of plowing can be done without leaving unplowed space between every furrow.

slice, as the plows can be adjusted to operate or cut close up to the furrow previously made; also, in plowing the outside of a circle (especially small circles) the plows can be made to cut equal furrow-slices and take enough land by simply manipulating the said hand-lever H.

For side-hill plowing, the operator can, by means of the same hand-lever H, adapt the plows to take as much land as desired, and otherwise operate the plows, without interfering with the action of the draft. By adjusting the lever H to the left a notch or two, the plows will take more soil; by setting the lever to the right, less soil or land-side. All the changes can be made while the plows are moving or plowing.

What I claim is—

1. The bed-plates B B′, the transverse shaft b', the pivot b, the foot-lever F′, main axle a, wheels A A^1, hand-lever F, the upright frame C, supporting the plow-beams carrying plows, all said parts being combined, constructed, and arranged to operate substantially as set forth.

2. In a gang-plow, the combination of the eccentric having cam-arm, the plow-beam having oval yoke-bar, the chain-connection of cam-arm with foot-stanchion, the hand-lever to operate said eccentric, the guide-frame, all said parts being constructed and arranged as shown and described, to operate the plows for vertical adjustment, as and for the purposes set forth.

3. In a gang-plow, the plow-beams carrying plows, the oval yoke-bar, the eccentric having cam-arm, the chain-connection of cam-arm with foot-stanchion, the hand-lever to operate said eccentric, the guide-frame having its lower end secured to a transverse shaft, the plow-truck having bed-plate parts to contain said shaft, all said parts being combined, constructed, and arranged as shown and described, to operate in the manner and for the purposes set forth.

4. The hand-lever H, the segment-bar h, the collars g g, the arms g^1 g^2, the connecting-rod g^3, in combination with plow-beams carrying plows, the standards of which pass through said collars, by means whereof the lateral adjustment of the plows is achieved in the manner and for the purposes set forth.

In testimony of said invention I have hereunto set my hand.

MAX J. FREEMAN.

Witnesses:
O. P. LACY,
FERDENAND F. VOIGT.