(No Model.) 3 Sheets—Sheet 1.

A. PIRCH.

REVERSIBLE PLOW.

No. 477,912. Patented June 28, 1892.

Fig. 1.

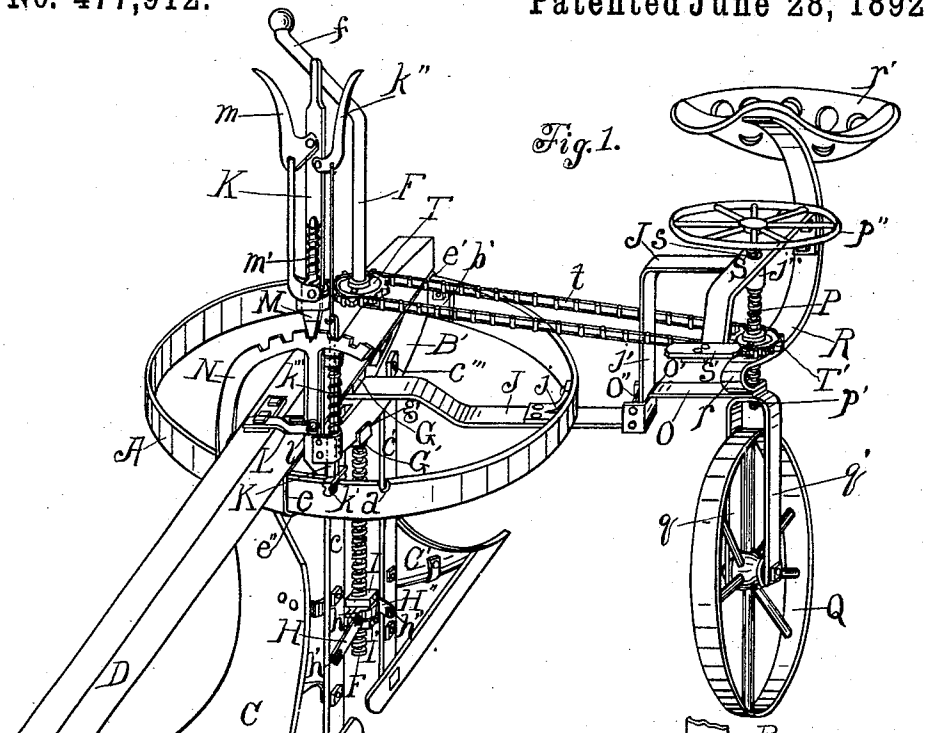
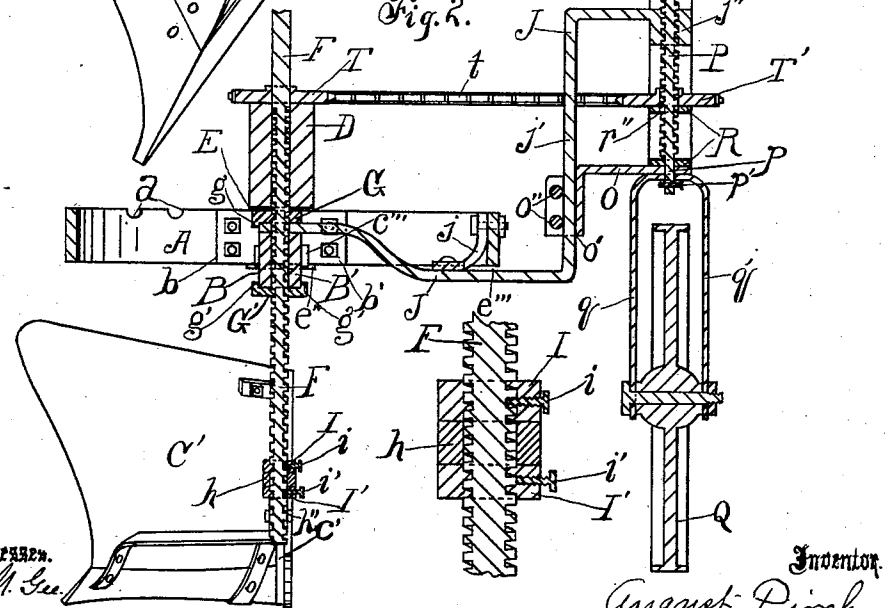


Fig. 2.



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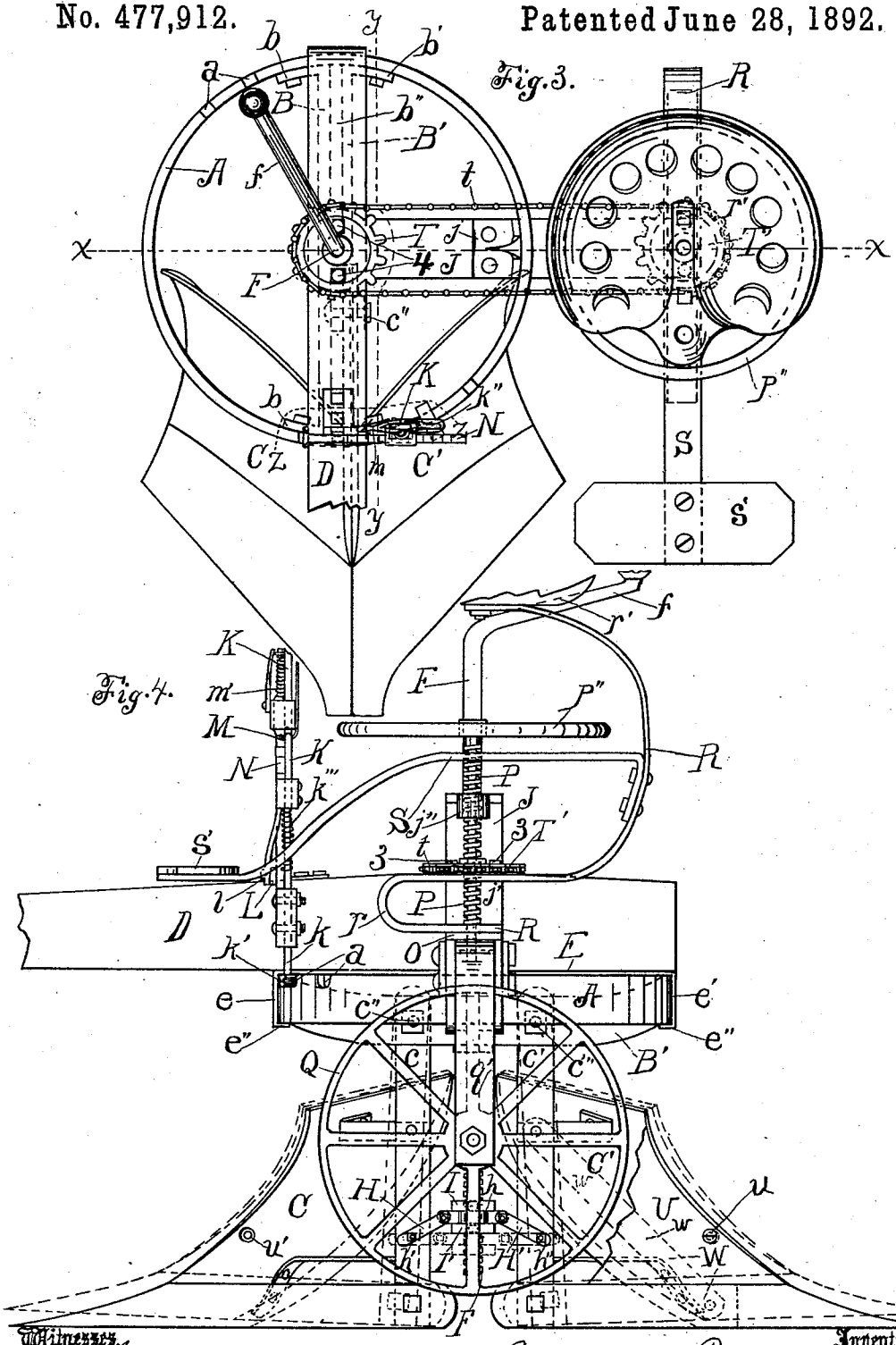
THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

A. PIRCH.

REVERSIBLE PLOW.

No. 477,912. Patented June 28, 1892.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

A. PIRCH.

REVERSIBLE PLOW.

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Fig. 5.

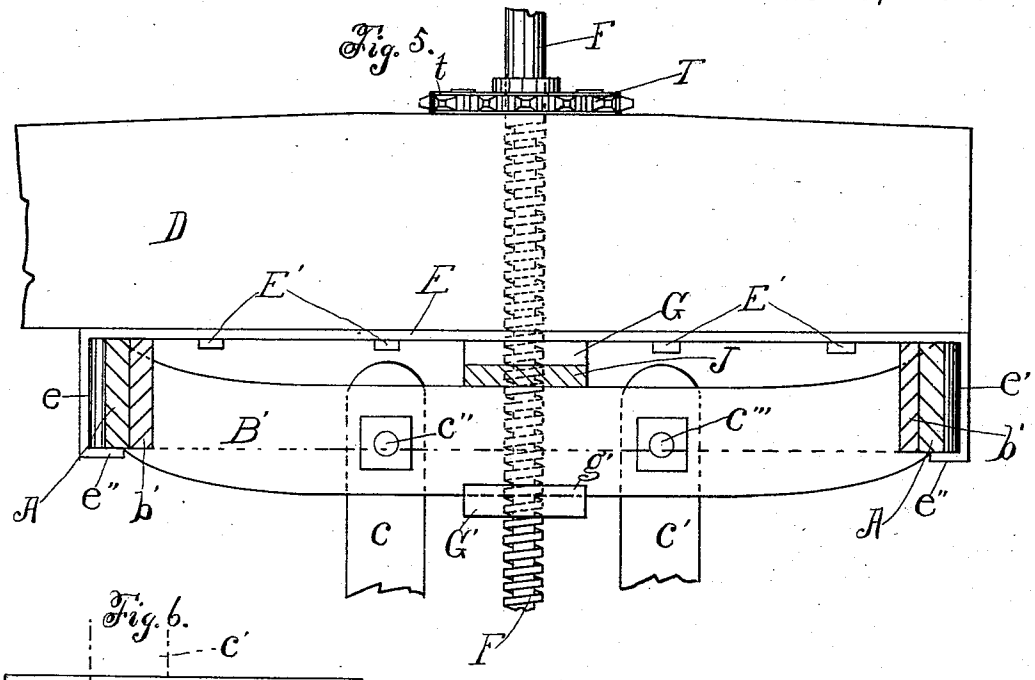


Fig. 6.

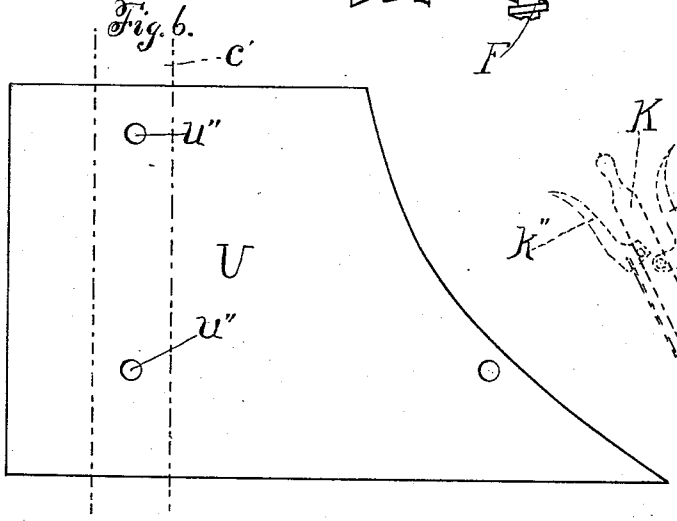


Fig. 8.

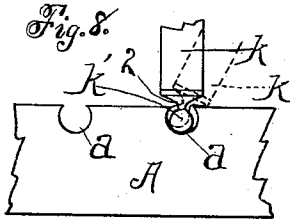
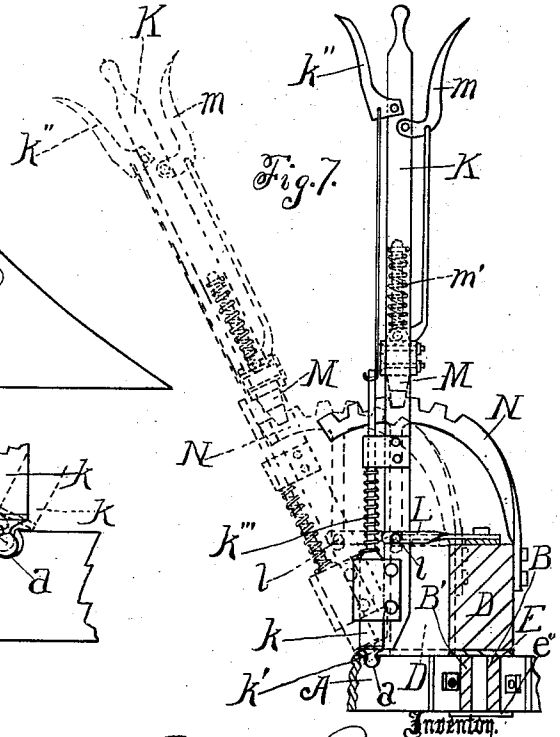


Fig. 7.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

AUGUST PIRCH, OF LOS ANGELES, CALIFORNIA.

REVERSIBLE PLOW.

SPECIFICATION forming part of Letters Patent No. 477,912, dated June 28, 1892.

Application filed March 17, 1892. Serial No. 425,233. (No model.)

To all whom it may concern:

Be it known that I, AUGUST PIRCH, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Reversible Side-Hill and Ditching Plows, of which the following is a specification.

My invention relates to that class of plows in which a right and a left hand plow are secured together rear to rear and pointing in reverse directions.

One object of my invention is to increase the efficiency and convenience of operation of this class of plows and to adapt such plows for ditching purposes.

A further object of my invention is to produce a sulky-plow of this class which may be adjusted to the slope of the ground upon which it is used and which, without changing the position of the sulky with relation to the plow, will automatically turn the seat as the plow-beam is reversed, so that the driver will always face the team without any effort on his part to that end.

A further object is to provide convenient means for gaging the depth and width of the furrow which the plow will open.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective front view of my improved plow arranged to operate as a side-hill plow. Fig. 2 is a fragmental transverse sectional view on line *x x* of Fig. 1. Fig. 3 indicates the line of section. In this figure is also shown an enlarged detail of the lower end of the plow-operating shaft with the thrust-nuts and collar in place. Fig. 3 is a plan view of my improved plow arranged for ditching purposes. Fig. 4 is a fragmental side elevation of Fig. 1. Fig. 5 is a fragmental sectional view on line *y y*, Fig. 3, looking toward the left. Fig. 6 is a plan elevation of the landside dirt-guard removed from the plow. The position of the plow-standard *c'* is indicated by dotted lines in this view. Fig. 7 is a rear elevation of the beam-adjusting device, showing a second position in dotted lines. A portion of the guide A and a fragment of the beam and truss are shown in this view. Line *z z*, Fig. 3, indicates the point of view. Fig. 8 is a fragmentary view illustrating the guide engaging the pawl-head and the notches arranged in the guide to receive it.

A portion of the beam is broken away in Figs. 1, 3, 4, and 5 to contract the view.

My invention comprises the combination of a reversible plow having its beam journaled to revolve, a sulky-wheel arranged at one side of such beam and attached thereto by intermediate means, a seat arranged above such sulky-wheel and journaled to revolve, suitable intermediate means connecting the plow-beam and the seat to cause the seat to rotate in correspondence with the plow-beam when such beam is rotated, and means for locking the beam with relation to the plow.

My invention also comprises the combination, in a plow, of a horizontally-arranged hoop or band forming a circular beam guide and brace, a truss extending across the center of such guide and secured at each end to such guide, a right and a left hand plow placed rear to rear and having their standards pivotally secured to such truss, a plow-beam arranged substantially in line with the truss and pivoted thereto by a pivot arranged at the center of the circular guide, suitable means for guiding such plow-beam around such circular guide, suitable means for locking such beam upon such guide, and suitable means for depressing or elevating the points of such plows to cause them to enter or withdraw from the ground.

My invention further comprises the combination of a circular beam guide or brace, a truss extending across the center of such circular guide and having its ends attached to such guide, a plow-beam pivoted to such truss at the center of the circular guide and provided with guiding devices arranged to engage such guide and slide therearound when the beam is rotated, a right and a left hand plow placed rear to rear and having their standards pivotally secured to the truss, a sulky-arm having its inner end attached to the truss, extending outward under the circular guide and attached thereto, a supporting-wheel adjustably secured to the outer end of such sulky-arm, a seat-bow provided with a seat and pivotally attached to such sulky-arm, a sprocket-wheel fixed to such seat-bow at its

pivotal point, a sprocket-wheel attached to the plow-beam at its pivotal point, a sprocket-chain connecting such sprocket-wheels, means for locking the plow-beam in position upon the circular guide, and means for depressing and elevating the points of such plows to cause them to enter or to withdraw from the ground.

My invention also comprises the combination of a plowshare and a mold-board, a standard secured thereto, a beam-guide attached to such standard and provided with a suitable pawl-receiving notch and arranged to allow lateral movement of such beam, a plow-beam provided with a suitable guideway arranged to engage such guide to allow lateral movement of the beam, a beam-adjusting lever pivotally secured to such plow-beam and provided with a pawl arranged to engage a suitable rack rigidly fixed to the beam, such rack, and means for operating the pawls.

The invention also comprises, in a reversible plow, the combination of a right and a left hand plow secured rear to rear, a plow-beam attached to such plows, suitable means for operating such plows, and a sheet-metal landside dirt-guard substantially conforming to the shape of and arranged to cover the open space upon the landside of each plow, and suitable means for securing such guards to such plows.

My invention also comprises various other features and combinations hereinafter fully set forth and claimed.

The circular guide A is formed of a band or hoop of wrought, cast, or forged metal of suitable thickness to secure the desired strength. As illustrated in the drawings, the truss which extends across the guide A is formed of the parallel transverse beams B B′, which have their ends *b b′* firmly secured to such band upon the inside thereof, and are arranged with a space *b″* (shown in dotted lines in Fig. 3) between them to admit the standards *c c′* of the plows C C′, which are secured therebetween by means of the bolts *c″ c‴*. It will be understood that if the guide A is of cast metal the truss may be cast integral therewith without departing from my invention.

The plow-beam D is provided on its under side with the guide-bearing and draft-plate E, which is secured to the beam by bolts E′, and is provided at its ends with the guide-seats *e e′*, which are arranged to embrace the circular guide or rack A, the lugs *e″* preventing upward displacement of the beam.

The plow-beam D is pivoted to the truss B B′ by means of the plow-depth-adjusting screw-shaft F, which is provided at its upper end with the crank-arm *f*, and which passes through suitable holes provided in such plow-beam and plate E therefor and also through the nuts G G′, which are arranged above and below the truss B B′, and are secured thereto by suitable means, such as the lugs *g g′*, which are arranged to engage the end of the sulky-arm J and the sides of the truss-beams B B′, respectively, to prevent the nuts from turning when the shaft F is rotated. The shaft F extends below the nut G′ to a point near the base of the plow-standards *c c′*, to which standards it is connected by means of the braces H H′, which are pivoted to the standards by bolts *h′ h″*, and are also pivoted to the collar *h*, which acts as a journal-box for the lower end of the shaft F. Above and below the collar *h* are placed the thrust-nuts I I′, which are rigidly secured upon the shaft F by suitable means, such as the set-screws *i i′*.

To regulate the width of the furrow which the plow will open, I provide the lateral plow-beam-adjusting lever K, which is pivoted to the plow-beam D by intermediate means, such as the brace L and pivot *l*, and is provided with a pawl *k*, which has a head *k′*, which is nearly cylindrical in form and is connected with the body of the pawl by a narrow neck 2, and is adapted to engage the notches *a*, which are provided in the top of the guide A for its reception. This pawl is operated by a grip-lever and connecting-rod *k″* and a spring *k‴*.

When the plow-beam is thrown over, as is indicated in dotted lines in Fig. 7, an ordinary-shaped pawl-head would be withdrawn from the notch if the line of draft were suddenly shifted toward the left. To prevent this I make the pawl-head *k′* nearly cylindrical in form and attach it to the body *k* of the pawl by a neck 2, and I also make the notches *a* of a circular form with contracted mouths. When the lever K is inclined, as indicated in dotted lines in Fig. 7, the pawl-head will be retained in the notch by the contracted mouth of the notch until the lever K is thrown upright.

Fig. 8 illustrates in dotted lines the position assumed by the head of the pawl in the notch *a* when the lever K is inclined to the right. The lever K is also provided with a pawl M, which is arranged to engage a rack N, which is rigidly fixed to the plow-beam D, and such pawl is operated by the grip-lever and connecting-rod *m* and spring *m′*. It will be understood that the rack N forms the arc of a circle, of which the pivot *l* is the center. The inner end of the sulky-arm J rests upon the top of the truss-beams B B′ and is secured in place by the stem of the screw F, which passes therethrough, and such arm is bent downward and passes out beneath the guide A, to which it is rigidly secured by means of the brace-strap *j*, which is arranged to hold the arm a sufficient distance below the bottom of the guide to leave a space *e‴* to allow the passage of the lug *e″* between the arm and guide when the plow-beam is reversed by semi-rotating it upon the shaft F. A short distance outward from the guide A the sulky-arm J is bent at right angles and extends upward a suitable distance to form a vertical guide *j′* for the supporting-wheel guide-brace

arm O, which is provided with the guide-seat O′ and the anti-friction rollers O″, arranged to slide along the guide *j′*. Above this guide portion *j′* the arm is again bent at right angles and at its end is provided with the nut *j″*, through which the wheel-height-adjusting screw P screws to raise and lower the wheel Q with relation to the plows C C′. The wheel Q is journaled between the two arms *q q′*, which are formed of a single strap of metal bent into U shape and attached to the brace-arm O by welding or other suitable means. Upon the top of the outer end of the brace-arm O and directly over the axle of the wheel Q is placed the seat-bow R, which is reversely bent to form the U-shaped portion *r*, and the stem of the wheel-adjusting screw P is passed through suitable perforations provided in such reverse bends. The bow is then bent to the rear and bowed upward and forward to receive the seat *r′*. The foot and seat-bow brace S is attached to the seat-bow spring R and extends toward the front over the nut *j″* and is provided with a hole *s*, through which the stem of the screw P passes freely, and also is provided on its outer end with a foot-rest *s′*.

To the top member of the reverse bend *r* is rigidly secured the sprocket-wheel T′ by bolts 3, and which is connected by sprocket-chain *t* with the sprocket-wheel T, which is rigidly secured upon the beam D at its pivotal point by bolts 4. The hole *s* in the foot-rest brace S and the hole *r″* in the upper member of the bend *r* of the seat-bow spring R, through which the wheel-adjusting screw-shaft P passes, are large enough to allow the said shaft to slip easily therethrough. The screw-threads upon the lower end of such shaft are cut away to form the tenon *p*, which passes through the lower member of the reverse bend *r*, the wheel-brace arm O, and the top of the inverted U-shaped wheel-arms *q q′*, and is secured against removal by the pin *p′*. A suitable hand-wheel *p″* is secured upon the top of the screw-stem P to operate the screw to raise and lower the wheel Q with relation to the plows.

U is a sheet-metal guard-plate conforming to the shape of and arranged to cover the open space upon the landside of the plow to prevent the dirt from falling between the plows when in use, which would result in raising the rear plowshare in passing over the dirt which had fallen between the plows and so cause the front plow to run too deep. In Fig. 4 I have shown a fragment of this plate secured upon the rear plow; but in the other views they are removed to expose the construction. *u* is a screw, which passes through such plate and screws into the lug *u′*, which is provided upon the mold-boards. *u″* are perforations, through which bolts may be passed to secure such guard-plate to the plow-standards in case it is deemed necessary.

In Fig. 3 I have shown the right and left hand plows, both pointing in the same direction to adapt the plow for ditching, the standard *c′* being secured to the truss-beam by the bolt *c″* and to the standard *c* by the bolt *h′*, which secures the brace H to the standard *c*. When placed in this position, the rear portion of the plow is unsupported, and to prevent the operator from tipping over backward when turning the plow I provide a suitable brace W, which I have indicated by dotted lines in Fig. 4, and which is simply the plow-standard and landside connected by a diagonal brace *w*. It will be understood that in practice the screw-stem F is designed to be strong enough to bear the thrust of the plow, or a suitable brace may be extended from the collar *h* to the rear portion of the guide A to receive the thrust. This, however, would readily suggest itself to any one versed in the art and does not require illustration.

In practice the operator rotates the screw F, which screws through the nuts G G′. The thrust-nuts I I′, rotating with the screw-stem, bear against the collar *h* to raise or lower it with relation to the plow-beam. If the handle *f* is rotated to the left, the collar *h* is thrust downward and the braces H H′ force the standards *c c′* apart at the bottom and cause the points of the plowshare to rise, as indicated in dotted lines in Fig. 4. When it is desired to force the plow into the ground, the action of the screw is reversed and the bottoms of standards *c c′* are drawn toward each other, thus causing the points of the shares to lower and enter the ground. The operator can adjust the height of the wheel Q with relation to the plows C C′ by rotating the hand-wheel *p″*. The screw P, acting upon the screw-nut *j″*, forces the sulky-wheel Q nearer to or farther from such nut, and so raises or lowers the wheel with relation to the plows to suit the slope of the ground upon which it is used. When the end of the furrow is reached, the operator raises the pawl-head *k′* out of the notch *a* by means of the grip-lever *k″* and turns the horses from him in the reverse direction. The beam D, being freed from its engagement with the guide A, revolves upon the stem of the screw F as the horses turn. As soon as this rotation of the beam has carried the pawl-head *k′* beyond the notch *a*, from which it is raised, the operator releases the lever *k″* and the spring *k‴* forces the pawl down upon the upper face of the guide A, along which it slides until it reaches and enters the notch *a* upon the opposite side of the guide from that from which it was released, and so again locks the beam upon the guide. The operator drives the team back along the furrow opened when traveling in the reverse direction, the horse which traveled upon the land side while going traveling in the furrow in making the return trip. The same operation is repeated when the end of the furrow is reached, the operator thus alternately using the right and left hand plows and always throwing the furrow in the same direction. As the beam D re-

volves, the sprocket-wheel T revolves therewith, and acting through the medium of the sprocket-chain *t* rotates the sprocket-wheel T′, the seat-bow R, and seat *r′*, while the sulky-wheel Q, brace-arm O, and sulky-arm J hold the screw-stem P firm to allow the seat-bow and foot-brace to revolve thereabout, thus causing the seat to automatically turn and the driver to always face the horses without any effort for that purpose on his part.

When it is desired to change the width of the furrow which the plow will cut, the pawl M is released from the rack N and the lever K is then forced away from the operator, the pawl-head *k′* being in the notch *a*. The beam D is forced along the guide A away from the landside of the plow. When the plow is thus adjusted to cut the desired width of furrow, the pawl M is released and engages the rack N to hold the beam in the desired position upon the guide A. To cause the plow to take a narrow furrow, the pawl M is released from the rack, as before, and the lever K is drawn toward the operator, thus drawing the plow-beam over the landside of the plow which is in use, causing it to take a narrower furrow.

When it is desired to use the plow as a ditcher, the plows are placed side by side, as shown in Fig. 3, and are secured by the bolts *c″* and *h′*. These bolts are shown in Fig. 1. The plow thus throws the dirt right and left and forms a ditch. If desired, an additional set of plowshares may be attached by the bolts *c‴* and *h″*, so that the ditcher will be reversible the same as when arranged for side-hill plowing. The draft and guide-bearing plate E pulls against the circular guide A but the truss-beams B B′ being substantially in line with the plow-beam D the strain is practically upon the truss and not upon the guide. As the beam revolves, the lugs *e″* slide along the bottom of the guide and holds the beam firmly upon the track or guide.

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

1. In a plow, the combination set forth of a plow-beam pivoted to the plow, a circular guide and rack fixed to the plow, means for locking the beam to the rack and releasing it therefrom to allow its rotation, a sulky-wheel connected with the guide and rack by a suitable arm, and means for depressing and elevating the points of the plow.

2. The combination set forth of the plow-beam, the plows pivoted thereto, the thrust-nuts attached to the beam, the screw-stem arranged to screw through the thrust-nuts and connected by suitable means to the pivoted plows near the base of the plow-standards, and means for rotating the screw-stem to draw the standards together or to force them apart to depress or elevate the points of the plows.

3. The combination of a reversible plow having its beam journaled to revolve, a sulky-wheel arranged at one side of such beam and attached thereto by intermediate means, a seat arranged above such sulky-wheel and journaled to revolve, suitable intermediate means connecting the plow-beam and the seat to cause the seat to rotate in correspondence with the plow-beam when such beam is rotated, and means for locking the beam with relation to the plow.

4. The combination, in a plow, of a horizontally-arranged circular beam-guide, a truss extending across the center of such guide and secured at each end to such guide, a right and a left hand plow placed rear to rear and having their standards pivotally secured to such truss, a plow-beam arranged substantially in line with such truss and pivoted thereto by a pivot arranged at the center of the circular guide, suitable means for guiding such plow-beam around such circular guide, means for locking such beam upon such guide, and means for depressing and elevating the points of such plows to cause them to enter or withdraw from the soil.

5. In a reversible plow, the combination of a circular beam guide or brace, a truss extending across the center of such guide and having its ends attached to such guide, a plow-beam pivoted to such truss at the center of the circular guide and provided with guiding devices arranged to engage such guide and slide therearound, a right and a left hand plow placed rear to rear and having their standards pivotally secured to the truss, a sulky-arm having its inner end secured to the truss, extending outward under the circular guide and attached thereto, a supporting-wheel adjustably secured to the outer end of such sulky-arm, a seat-bow provided with a seat and pivotally attached to such sulky-arm, a sprocket-wheel fixed to such seat-bow at its pivotal point, a sprocket-wheel attached to the plow-beam at its pivotal point, a sprocket-chain connecting such sprocket-wheels, means for locking the plow-beam upon the circular guide, and means for depressing and elevating the points of such plows to cause them to enter or to withdraw from the ground.

6. The combination of the plow share and the mold-board, the standard secured thereto, the beam-guide attached to such standard and provided with a suitable pawl-receiving notch and arranged to allow lateral movement of such beam, the plow-beam provided with suitable guideways arranged to engage such guide to allow lateral movement of the beam, the beam-adjusting lever pivotally secured to such plow-beam and provided with the pawl arranged to engage the guide and also provided with the pawl arranged to engage a suitable rack secured to the beam, such rack, and means for operating the pawls.

7. In a reversible plow, the combination of the circular beam-guide, the truss extending across the axis of such guide, the right and left hand plows placed rear to rear and hav-

ing their standards pivotally secured to such truss, the plow-adjusting screw passing through the plow-beam and the screw-nuts, such screw-nuts arranged above and below the truss, the collar journaled upon the lower end of such plow-adjusting screw, the thrust-nuts rigidly secured upon such screw above and below such collar, the braces pivotally connecting such collar with the plow-standards, the plow-beam provided with suitable guiding devices arranged to engage the circular guide to allow the beam to rotate upon the plow-adjusting screw-stem, and means for locking the plow-beam upon such circular guide.

8. In a reversible plow, the combination of the circular guide provided with the pawl-notch having a narrow mouth, the plow-beam pivoted to such circular guide, the beam-shifting lever pivoted to such beam and provided with the pawl having a cylindrical head connected to the shank of the pawl by a neck and arranged to engage such notch in the guide, a rack attached to such beam, suitable means arranged upon such beam-shifting lever to engage such rack, and a right and a left hand plow placed rear to rear and having their standards secured to such guide.

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