

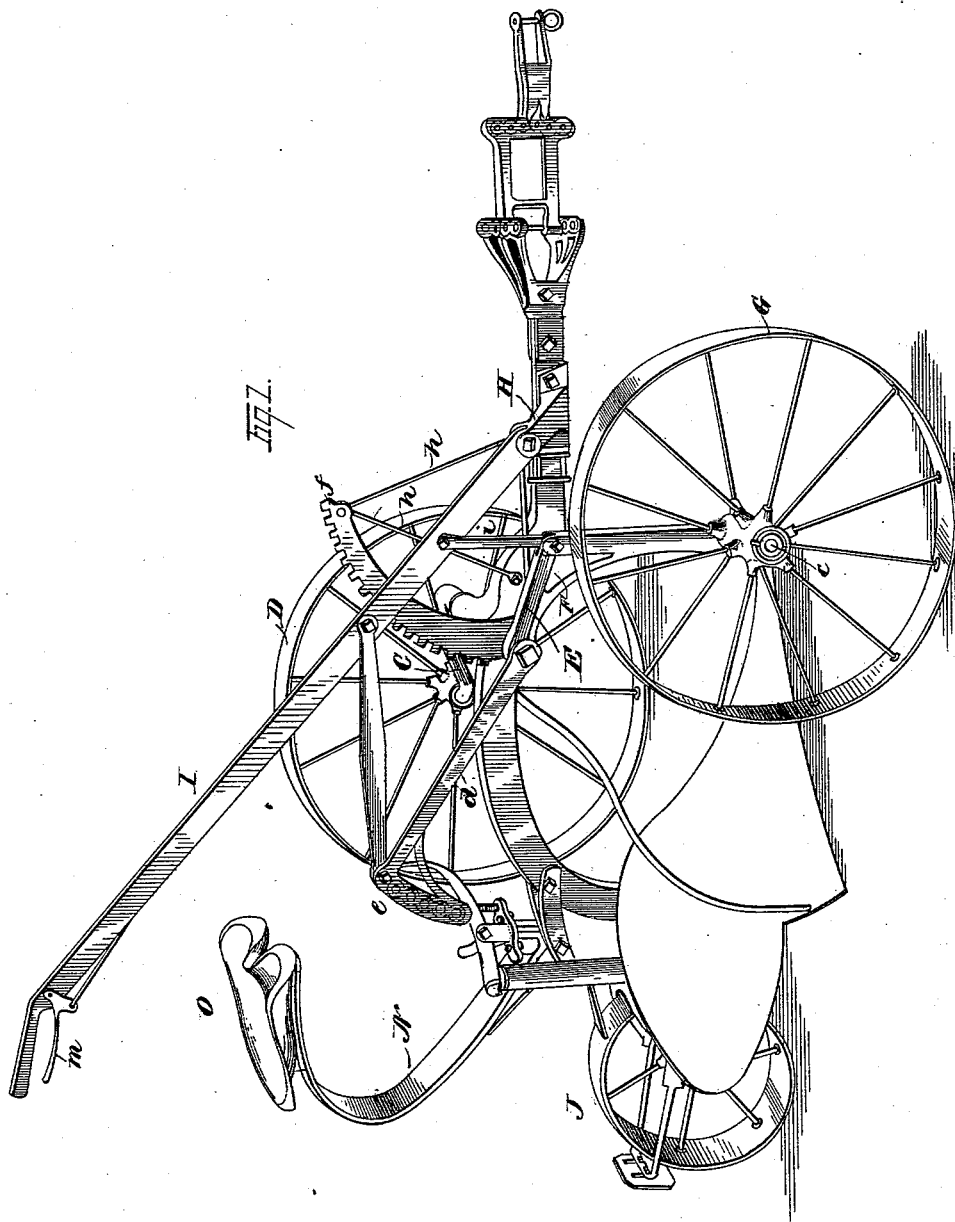
(No Model.)

2 Sheets—Sheet 1.

H. H. SATER.  
PLOW.

No. 420,249.

Patented Jan. 28, 1890.



Witnesses  
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

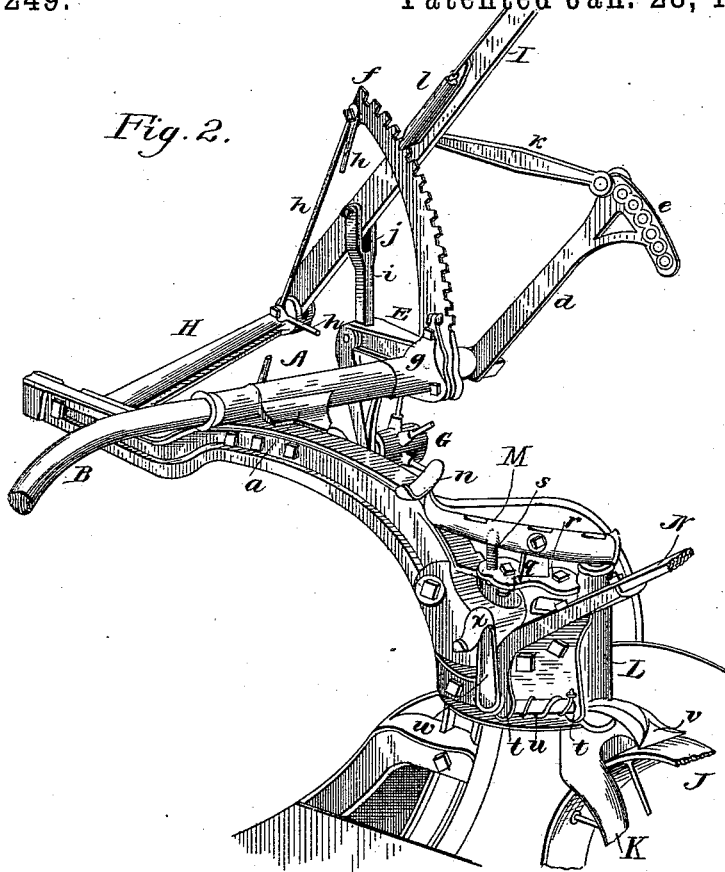


Fig. 3.

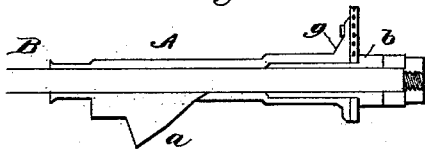


Fig. 4.

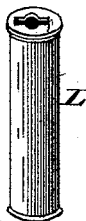


Fig. 5.



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# UNITED STATES PATENT OFFICE.

HANS H. SATER, OF DUBUQUE, IOWA.

## PLOW.

SPECIFICATION forming part of Letters Patent No. 420,249, dated January 28, 1890.

Application filed July 24, 1889. Serial No. 313,529. (No model.)

*To all whom it may concern:*

Be it known that I, HANS H. SATER, a citizen of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Wheeled Plows; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a new and useful wheeled plow and to various novel improvements therein, which will be adapted for use either as a walking or as a riding plow, and which can be used either as a two or a three wheel plow, according to circumstances or choice.

The principal object of my invention is to do away with the customary heavy and expensive frames and braces now used on all varieties of wheeled plows and to attach the wheel-axle and operating-lever directly to the plow-beam. By thus dispensing with such frame and braces I am enabled to produce a plow which can be manufactured much more cheaply than heretofore and which will be much lighter and more portable than former plows. Moreover by the construction of plow I have adopted the operation of the moving parts is much simplified, and I am enabled to control the land and furrow wheel with much greater ease and facility than had been attained prior to my invention.

Another advantage attendant on the peculiar construction of my improved plow is that all parts are of ready access to the operator, and in case of a breakage to any part it can be easily removed and replaced by a new piece.

A further object of my invention is the utilization of a rear wheel, by means of which the plow is converted into a three-wheel plow, and which can be used either as a "brace-wheel" (in lieu of a better expression) for relieving the lateral strain or pressure on the mold-board or as a caster-wheel for the support of the rider or operator and to prevent any disarrangement of the plow with relation to the ground, the difference in function between the two being accomplished by a simple movement of a foot-lever.

A still further object of my invention is to dispense with the usual tongue or shaft, and to use instead an ordinary clevis, thereby making the plow much lighter and more economical in another particular, the movements of the plow being controlled by means of a brake acting on the rear wheel and actuated by a foot-lever operated by the rider.

Another object of my invention is to make use of but one lever for controlling the land and furrow wheels, thereby simplifying the construction materially.

For a thorough understanding of my invention, taken in connection with the description following hereinafter, attention is invited to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a side perspective view of my improved plow, showing the same as arranged for a three-wheeled riding-plow; Fig. 2, a rear perspective view of my improved plow, illustrating the mechanism for controlling the land and furrow wheels and the attaching and auxiliary mechanism for the rear wheels; Fig. 3, a sectional view of the supporting-sleeve for the main axle with the axle in position thereon; Fig. 4, a separate perspective view of the supporting-yoke of the rear wheel and the retaining-sleeve for the same; Fig. 5, an enlarged view of the foot-lever for the rear wheel, illustrating the adjusting mechanism for the same.

The elements and devices forming the essential spirit of my invention are entirely independent of the plow and can be used with any variety of plow having a plow-beam. The plow shown in the drawings is merely for illustration, and I do not wish to be limited to its use.

My invention may be divided into two parts, which will be described in their order, consisting of, first, the means whereby the land and furrow wheels are attached to the plow-beam and the mechanism for controlling said wheels, and, second, means for attaching the rear wheel to the plow-beam and the controlling mechanism therefor.

Rigidly bolted to the plow-beam, at one side thereof, is the clip *a*, made integral with the long horizontal bearing-sleeve *A*. Other equivalent means may be used for attaching this sleeve in position on the plow-beam with—

out departing from the essential spirit of my invention. The main axle B extends within this sleeve, and is provided at one end with a crank-arm C, which extends approximately horizontal when the plow is in the ground. At the extreme outer end of this crank-arm C is an integral spindle, upon which is mounted the land-wheel D. At the side of the sleeve A farthest from the plow-beam the recess is made somewhat larger than the axle B, and within this enlargement of the sleeve is placed a collar *b*, made integral with the horizontal arm E of the knee F. The vertical arm of this knee F is provided at its lower end with an integral spindle *c*, on which is mounted the furrow-wheel G. It will now be seen that the crank-axle B can be rotatively moved within the sleeve, and the collar *b* of the knee F can be moved independent of the axle. The end of the axle opposite from the crank portion is provided with an irregular portion on which is mounted an arm *d*, which is held in position thereon by means of an ordinary nut. By this means the arm *d* will be practically rigid with the crank-axle B, and the movements of one will be transmitted to the other. The upper part of the arm *d* is formed into a segment *e*, having a series of holes therein, for the purpose hereinafter described. The segmental rack *f* extends directly up from the sleeve A at a point adjacent to the outer end of the collar *b*. In order that the attachment of this segmental rack to the sleeve A may be a very secure one, I provide the sleeve all round with an integral flange *g*, to which the rack may be bolted, and as a further means of rigidity for this rack I make use of suitable bracing-rods *h h h*, extending up from suitable points. At a point on the plow-beam somewhat in advance of the sleeve A, I secure an arm H by any suitable means—such as bolts or set-screws—and this arm is approximately horizontal. The outer end of this arm is provided with an enlarged head having a bearing therein, within which is pivotally mounted the lower end of a long lever I. At the angle of the knee F is another bearing, corresponding with that on the end of the arm H, and within which is mounted the lower end of a connecting-link *i*. The upper end of this link is formed into a yoke *j*, encircling the lever I, which is pivoted therein. A suitable connecting-rod *k*, which is approximately horizontal, serves as a connection between the lever I and the segmental head of the arm *d*. This connecting-rod *k* is provided at its extreme end with a suitable pin which engages in any one of the openings in the segmental head of the arm *d*, and is retained in such position by means of a nut. It will be apparent that this pin may engage with any of the holes on the segmental head of the arm *d*, and in this way the relative position of said arm *d* to the lever I may be nicely adjusted and the height of the land-wheel in this way may be effectively regulated. The path of

movement of the lever I is directly adjacent to and parallel with the segmental rack *f*, and this lever I is provided with an ordinary latch *l*, having a spring-bolt which is adapted to engage with the teeth of the segmental rack *f*, and which is operated by means of a hand-lever *m*, located near the top of the operating-lever I. The operating-lever I is provided at its upper end with an ordinary handle by which it may be conveniently grasped.

The operation of the land and furrow wheels by means of the mechanism I have just described is as follows, it being supposed that the lever is at its highest elevation and that the plow is in engagement with the ground: The lever I is pressed downwardly, being fulcrumed at the outer portion of the arm H, and carries a link *i* in its motion and pressing the knee and the furrow-wheel downwardly, the collar *b* rotating within its recess. The same motion of the lever I, through the instrumentality of the connecting-rod *k*, causes the arm *d* to be thrown backwardly, in this way partially rotating the crank-axle and forcing the crank-arm thereof and the land-wheel downwardly. This downward movement of the furrow and the land-wheel will, of course, raise the plow out of the ground. The lever I can then be locked at its lowest position by means of the latch already referred to. By means of the segmental head of the arm *d* the height of the land-wheel with relation to the lower end of the plow can be easily adjusted; but it will be observed that this adjustment of the land-wheel is entirely independent of the furrow-wheel, which is, and always should be, in line with the point of the plow.

By means of the mechanism I have just described it will be evident that the movements of the land and furrow wheels are not only controlled by one single lever, but that I have dispensed to a great measure with the frames and braces now in universal use on wheel-plows.

When it is desired to use the plow as a three-wheeled riding-plow, I make use of a small rear wheel J, which can be used either as a brace-wheel or as a caster-wheel, as will be described hereinafter. The main casing for the support of this rear wheel and its auxiliaries is entirely independent of the plow, and is attached to the plow-beam by means of suitable bolts or equivalent means directly above the mold-board, so that the rear wheel when in position will trail directly behind the same. The rear wheel is mounted within a suitable yoke K, provided at its top with an integral cylindrical spindle *m'*, provided at its upper end with a key portion *n* and with a neck *o*. The horizontal axis of the rear wheel J is located in a vertical plane somewhat back of the spindle *m'*, so that said wheel will trail behind the spindle. A cylindrical casing L for the reception of the spindle *m'* is made integral with the main casing for the rear wheel, and is provided within its top with a slot cor-

responding to the head *n* of said spindle and with a circular portion corresponding with the neck *o*.

It will be seen that when the spindle *m'* is introduced within the casing *L* and the head *n* passed within the slot of said casing and turned partially around it will be impossible to withdraw the spindle only when the head thereof comes into a coincident relation with the head of the casing. I provide the main casing of the rear wheel with a flat portion for the convenient attachment of the controlling-lever for said wheels. Secured directly on top of this flat portion is a bearing-piece *p*, provided with slots therein, by which its relative position on said flat portion may be conveniently adjusted, as will be apparent. Extending up from the central part of this bearing piece or part is a standard *q*, forming the pivoting-point for a short foot-lever *M*. This lever *M* is provided at one end with a foot-piece *r* and at the other with a recess corresponding in size and in shape to the head of the spindle *m'*, which is adapted to be held therein. The rear portion of this foot-lever is normally held in position over the head of the spindle *m'* by means of a coiled spring or equivalent *s*. It will now be seen that when the rear portion of the lever is in position over the head of the spindle *m'* the rear wheel will be incapable of turning on its vertical axis and will be held perfectly rigid; but as soon as the lever is lifted from said position the head of the spindle will be immediately free and the rear wheel will be able to move at will. Extending up from the casing of the rear wheel is a curved arm *N*, made preferably of spring metal and provided at its upper end with a seat *O* for the operator. This seat is in such relation to the lever *M* that the foot-piece thereon will be in easy and convenient reach of the operator. Directly beneath the attaching-point of this arm *N* are formed two ears or lugs *t t*, integral with the casing for the rear wheel, and which form bearings for a horizontal metallic arm *u*. This horizontal arm is provided at one end with an enlarged portion *v*, forming the brake-shoe, and which is adapted to be forced against the periphery of the rear wheel, and at the other end with an extension *w*, having a foot-piece *x* thereon, adapted to be operated by the rider. The brake-shoe is kept normally away from engagement with the periphery of the rear wheel by means of a coiled spring encircling the arm *u* and exerting a constant tension thereon. I have found it necessary to make use of this brake for the reason (since I have dispensed with the usual shafts or poles now used on wheel-plows) that there may be no possibility of the plow running into the horses when the plow proper is out of the ground. When it is desired to use the rear wheel simply as a brace-wheel, the rear end of the lever *m* is kept permanently down on the head of the spindle *m'*, so as to render the rear wheel perfectly rigid.

In this way the wheel serves to relieve the mold-board, which is directly to one side in advance of it, from considerable lateral strain caused by the pressure of the ground against it; but when the rear wheel is to be used as a caster-wheel or in turning corners the foot-piece of the lever is depressed, thereby disengaging the head of the spindle *m'*, and the rear wheel is at liberty to move freely.

It will be apparent that by elongating the horizontal portion of the main axle *B* it will be possible to make use of another plow or even more by simply suspending such additional plow from the axle by means of sleeves corresponding with the sleeves *A*; and if such additional plows are made use of, and in some sections of the country such an arrangement might prove to be a very desirable one, there would be no necessity of making use of more than one operating-lever *I*, as will be apparent.

Having now described my invention, what I claim is—

1. In wheeled plows, one or more plows pivotally suspended beneath a crank-axle, a land-wheel mounted in one end of said crank-axle, an arm *d*, rigidly secured to the other end of the crank-axle, a knee pivotally mounted on said crank-axle and carrying on its lower end a furrow-wheel, and an operating-lever pivoted to the plow-beam and connected with the said knee and with said arm *d* for controlling the movements of said land and furrow wheels, substantially as and for the purpose set forth.

2. In wheeled plows, one or more plows pivotally suspended beneath a crank-axle, a land-wheel mounted at one end of said crank-axle, an arm *d*, rigidly secured to the other end of said crank-axle, a knee *F*, mounted on said crank-axle, a furrow-wheel mounted at the lower extremity of said knee, an operating-lever pivoted to the plow-beam, a connecting-link connecting said operating-lever with said knee, and a connecting-rod forming a similar connection with said lever and said arm *d* for controlling said land and furrow wheels, substantially as set forth.

3. In wheeled plows, one or more plows suspended beneath the crank-axle, a land-wheel mounted at one end of said crank-axle, an arm *d*, rigidly secured at the other end of said crank-axle, a knee *F*, mounted on said crank-axle, a furrow-wheel mounted at the lower end of said knee, a segmental head on the end of said arm *d*, an operating-lever pivoted to the plow-beam, a connecting-link connecting said lever and said knee, and a connecting-rod *k*, forming a similar connection between the operating-lever and the segmental head of the arm *d* for controlling said land and furrow wheels, substantially as set forth.

4. In wheel-plows, one or more plows suspended beneath the crank-axle, a furrow-wheel mounted on one end of said crank-axle, an arm *d*, rigidly secured to the other end of said crank-axle, a knee *F*, rotatively mounted

on said crank-axle, a lever I, pivoted to the plow-beam, connecting-link connecting said lever and said knee, a connecting-rod *k*, forming a similar connection between said lever  
5 and the arm *d*, a segmental rack held in rigid relation with the plow-beam, and a latch on said lever I, all arranged substantially as and for the purpose set forth.

5. In wheeled plows, one or more plows suspended beneath a crank-axle, a land-wheel mounted on one end of said crank-axle, a knee rotatively mounted near the other end of said crank-axle, a furrow-wheel at the lower end of said knee, and a segment *e* on the  
15 arm *d* for adjusting said land-wheel independent of said furrow-wheel, substantially as set forth.

6. In wheeled plows, a plow pivotally mounted between a land and a furrow wheel, and a  
20 rear wheel mounted in a yoke having a round spindle with a keyed head adapted to enter a slot in a foot-lever M for locking said wheel rigidly, substantially as set forth.

7. In wheeled plows, a plow pivotally suspended between a land and a furrow wheel, 25 a rear wheel located in a yoke, and with a keyed head adapted to enter a slot in an adjustable lever for rigidly locking said rear wheel, substantially as set forth.

8. In wheeled plows, a plow pivotally suspended between a land and a furrow wheel, 30 a rear wheel connected to the plow-beam, and a brake operated by a foot-lever and retracted by a spiral spring coiled around the part *u* and adapted to bear against the periphery of said rear wheel, substantially as and 35 for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HANS H. SATER.

Witnesses:

GEORGE CRANE,  
MONROE M. CADY.