(No Model.) 2 Sheets—Sheet 1.

S. A. KERNS & F. A. HEAD.

WHEELED PLOW.

No. 591,535. Patented Oct. 12, 1897.

Fig. 1.

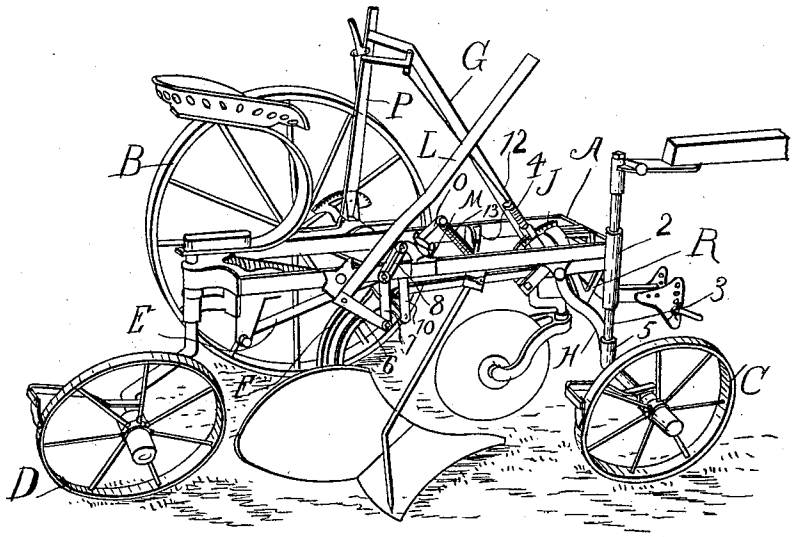


Fig. 3.

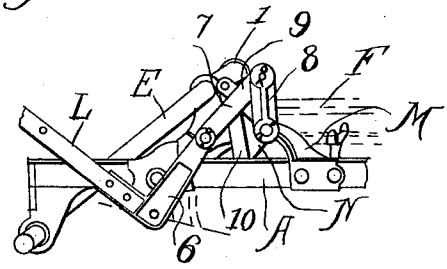


Fig. 4.

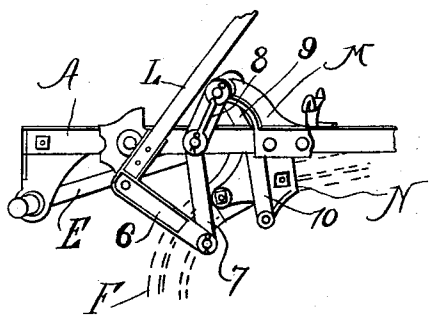
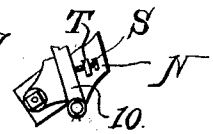


Fig. 7.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

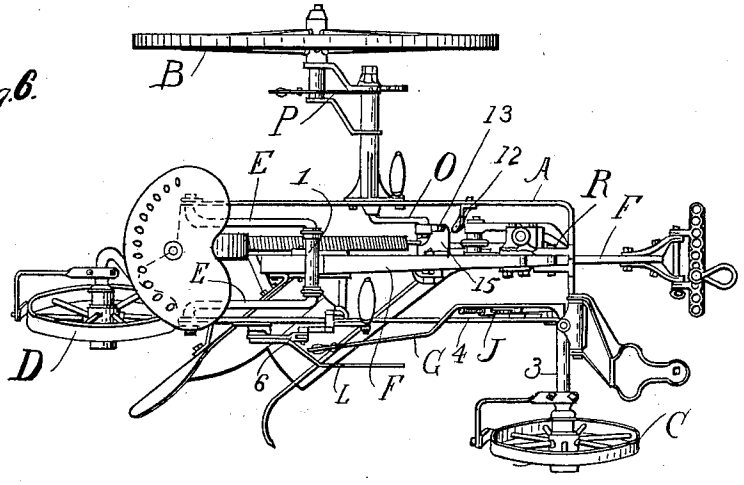


Fig. 5.

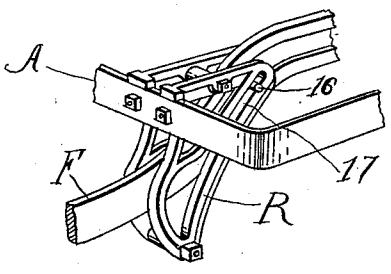
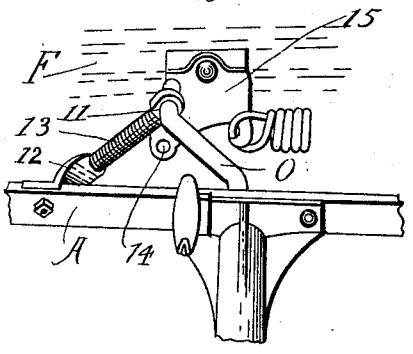


Fig. 2.



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UNITED STATES PATENT OFFICE.

SIMON A. KERNS AND FREDERICK A. HEAD, OF ROCK ISLAND, ILLINOIS.

WHEELED PLOW.

SPECIFICATION forming part of Letters Patent No. 591,535, dated October 12, 1897.

Application filed June 18, 1897. Serial No. 641,332. (No model.)

To all whom it may concern:

Be it known that we, SIMON A. KERNS and FREDERICK A. HEAD, citizens of the United States, residing at Rock Island, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Wheeled Plows; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention has reference to improvements in wheeled plows; and it consists in certain mechanical movements and devices for the more convenient handling of the plow, as hereinafter more fully set forth. One of the purposes sought to be attained in our invention is a more convenient and efficient mode of raising, lowering, and adjusting the front portion of the plow-frame upon the front furrow-wheel.

Another purpose is to provide an efficient means of raising and lowering the plow and coincidently leveling the latter by concurrent axial rotation of the land-wheel axle and locking the parts at the two limits of their action.

Another important provision is the cushioning of the inner end of the land-wheel axle on a coiled spring to overcome the unpleasant rolling or rocking motion imparted to a wheel-plow when the land-wheel passes over corn-rows or other uneven surfaces.

These and other advantages hereinafter described are illustrated by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a perspective of a machine embodying our invention. Fig. 2 is a detail of the adjustable attachment of the inner end of the land-wheel axle, optionally, either to the plow-beam or to the frame of the machine. Figs. 3 and 4 are details of the means employed for raising and lowering the plow and at the same time leveling the plow laterally. Fig. 5 is a detail of the mode of projecting the plow-beam through the forward end of the plow-frame so as to permit the front end of the beam to have perfect freedom of vertical oscillation. Fig. 6 is a plan view of the machine, fully exhibiting the relative positions of the several material parts. Fig. 7 is a detail of the means for preventing the locking-down effect of the lever L.

Similar letters and figures refer to the same parts throughout the several views.

A is the usual rectangular plow-frame, suitably supported by the land-wheel B, front furrow-wheel C, and rear furrow-wheel D. A bail E has its open ends pivoted near the respective rear corners of the frame A and its central transverse portion passed through a sleeve 1, attached to the top of the plow-beam F.

The front end of the frame A is raised, lowered, and adjusted by the following mechanism: The front corner of the frame A is attached to a vertical sleeve 2, through which is loosely projected the vertical portion 3 of the axle of the front furrow-wheel C. A lever G, provided with the usual spring-pawl 4, is pivoted at its front end to the front corner of the frame A or in that locality. A short distance back from the front end of the lever G an arm H is pivotally connected at its lower end to a vertical sleeve 5, adapted to play on the vertical portion 3 of the axle of the front furrow-wheel C. The upper end of the arm H is pivotally attached to the lever G and also to the usual quadrant J, carried on said lever, said arm H and quadrant J being united in one piece. As the lever G is lifted upward it moves the upper end of the arm H upward and forward in an arc. The reverse effect is had on the lever H in the backward movement of the lever G, and as in both instances the upper end of the arm H is free to move to and from the forward attachment of the lever G the frame A is raised or lowered at the front end with great ease and convenience. It will be noticed that in raising the lever G as the upper end of the arm H moves toward the fulcrum or front end of the said lever the operation becomes easier the farther it has progressed. The arm H and quadrant J also rise and fall in their longitudinal oscillations.

Referring to Figs. 3 and 4, L is the general regulating-lever, employed to raise, lower, lock, and level the plow. The lever L is of a bell-crank form, having the short arm 6 rigidly connected to its main portion and at right

angles thereto. The extremity of the arm 6 of lever L is pivotally attached to an arm 7, the opposite end of which is pivotally attached to an arm or toggle 8, one end of which is pivotally seated on a casting M, attached to the frame A. Integral with the rocking arm 8 is the rocking arm 9, projected slightly divergent from the union of the said arms. The free end of the arm 9 is pivotally connected with the toggle 10, the opposite end of which is pivotally attached to the casting N, attached to the plow-beam F. In Fig. 3 the lever L is shown to be thrown backward and the plow-beam F is raised, and in Fig. 4 the lever L is shown thrown forward, in which position the plow is lowered.

Referring to Fig. 2, O is the inner end of the axle of the land-wheel B, which can be optionally attached to the frame A by means of a bolt 11, sleeved on the inner end of said axle and attached at its opposite end to a lug 12, attached to the frame A, a spring 13 being utilized between the head of the bolt 11 and its loose seat in the lug 12 to relieve the frame A from the otherwise sudden jars of the wheel B in passing over obstructions in its path. As shown attached in Fig. 3, the bolt 11, being attached to the frame A, the elevation of the axle O of the land-wheel B is governed independently and solely by the usual hand-lever P, seated near the outer end of said axle in position to rotate the latter about the center of the wheel B in the usual manner; but by seating the lower end of the bolt 11, Fig. 2, in the opening 14 of the casting 15, attached to the beam F, then the action on said beam effected by the mechanism shown in Figs. 3 and 4 will be coincidently communicated to the axle O through the medium of the casting 15 and bolt 11, so that the action of the lever L in raising or lowering the frame A and beam F will concurrently axially rotate the axle O, so as to proportionately raise or lower the outer end of said axle with reference to the hub of the land-wheel B, and thereby both raise or lower the plow vertically and level the same laterally by the one single movement of the lever L. The result of the construction described is the production of a compact, strong, and easily-managed wheeled plow.

In addition to the foregoing the attachment shown in Fig. 5 of the front of the plow-beam F to the frame A is accomplished as follows: The rear portion of the plow-beam F having but the one attachment to the frame A, that of the bail E, the front end of said beam would have a reasonably free vertical movement when not hampered by a forward connection. To avoid this is one of the objects of our invention. A bracket R, suitably bolted to the front end of the frame A and extending toward the rear, bestrides the plow-beam F. Short posts 16 project horizontally from the opposite sides of the beam F into slots 17, formed in the bracket R on each side of said beam, respectively. The upper ends of the slots 17 are narrow, because when the posts or bosses 16 are in the upper ends of said slots the plow is being carried, and it is desirable that there should be no wabbling, but when the bosses 16 are in the lower ends of the slots 17 the plow-beam is down at work, and said slots are there made wide in a vertical plane, so as to permit the plow-beam F a free vertical flexible movement, pivoting on its bail E, and in practical effect a vertical oscillating action, the same in kind and substantially the same in degree as though said plow were independent of all restrictions from the frame A. In the forward throw of the lever L the joint between arm 9 and toggle 10 is carried beyond the line of the opposite pivotal seats of said arm and toggle, and the plow is thereby locked down to its work. In the rearward throw of lever L the joint between the arm 7 and the arm 6 of lever L is carried backward beyond the line of the joint between arms 7 and 8 and the angle in lever L, and is there held by the weight of lever L and suspends the plow, so that but one lever is required to move and lock the plow both up and down. As in ground containing stone, stumps, or roots locking the plow down may expose the parts to fracture, we provide a set-screw S, seated in a lug T, on the casting N, Fig. 7, which takes against the forward edge of the toggle 10 before the latter reaches the locking locality and prevents the lock leaving the plow free to yield against immovable obstructions.

What we claim as our invention, and desire to secure by Letters Patent of the United States, is—

1. In a wheeled plow, the combination of a lever G provided with a spring-pawl 4 pivoted at its forward end to the frame of the machine, an arm H having a sleeved connection at its lower end with vertical portion 3 of the axle of the front furrow-wheel C and at its upper end pivoted to the lever G a slight distance in the rear of the attachment of said lever to said frame, vertical sleeve 2 attached to said frame and the furrow-wheel C provided with the vertical axle 3 projected upward through said sleeve 2 substantially as shown and for the purpose described.

2. The combination of an adjustable hand-lever G pivoted at its forward end to the frame of the plow, a quadrant J carried on said lever and adapted to be engaged by the spring-pawl 4 seated on said lever, and the arm H suitably pivoted and sleeved at its lower end on the axle 3 of the furrow-wheel C and pivoted at its upper end to the lever G in position to oscillate fore and aft in the movements of said lever G substantially as shown and for the purpose described.

3. In a wheeled plow, the combination of the lever L provided with a short arm 6, arm 7 pivoted thereto, arm 8 pivoted at one end to said arm 7 and at its opposite end to the frame A, arm 9 divergent from and integral

with the arm 8 and oscillating on the same pivot and pivotally attached at its opposite end to the plow-beam F, substantially as shown and for the purpose described.

4. In a wheeled plow, the combination of the lever L arms 7 and 8 flexibly connecting said lever to the frame of the machine and arms 9 and 10 extending said connection to the beam F, land-wheel B, axle O thereof journaled in the frame A and post 11 pivotally seated at one end on the inner extremity of the axle O and adapted to be attached at its opposite end to the casting 15 fastened to the plow-beam F whereby the raising and lowering function exerted by the lever L is extended to said axle O and by axially rocking the latter concurrently levels the plow laterally, substantially as shown and for the purpose described.

5. In a wheeled plow, in combination with the mechanism for raising and lowering the latter, the land-wheel B crank-axle O thereof, bolt 11 connecting the wrist of said crank to the beam of the plow, in the manner shown whereby the vertical movement of the plow-beam concurrently axially rotates the axle O in a proportionate degree to level the plow laterally for the purpose specified.

6. In a wheeled plow, the combination of the axle O of the land-wheel thereof provided at its inner end with a crank formation, the bolt 11 sleeved on the wrist of said crank and loosely attached through an opening to either the frame of the machine or the plow-beam, and a coiled spring 13 interposed between the head of said bolt and its opposite point of attachment whereby the concussions imparted to said axle by the irregularity of the land-wheel B are precluded from communication to said plow beam or frame, substantially as shown and for the purpose described.

7. In a wheeled plow, the combination of the frame A duplex bracket R attached thereto provided with the slots 17 of variant widths and the plow-beam F provided with lateral bosses 16 projected respectively into said slots and adapted to traverse the wider portion of the latter when the plow is at work, substantially as shown and for the purpose described.

8. In a wheeled plow, the combination of the lever L, suitably-supported frame A, the plow-beam F pivotally connected to said frame, arms 7 and 9 and toggles 8 and 10 intermediate said lever and said beam and adapted, in the rearward throw of said lever, to lock said beam in a suspended position and in the forward throw of said lever to lock said beam downward to its work, substantially as shown and for the purpose described.

9. In a wheeled plow, the combination of suitably-supported frame A, plow-beam F, suitably supported on said frame, toggle 10 pivoted at its lower end to said beam and at its upper end to the rocking arm 9, the arms 8 and 9 pivoted integrally to the frame A, arm 7 pivoted at one end to arm 8 and at its opposite end to the arm 6 of lever L, the said parts being so interconnected as when the lever L is thrown forward, the joint between arm 9 and toggle 10 falls forward of the line between the opposite ends of said arm and toggle and locks the plow downward, and when said lever is thrown rearward, the joint between the arm 7 falls slightly to the rear of the line between the opposite end of arm 7 and the angle of said lever L whereby the weight of said lever serves to lock said plow in an elevated position and thereby serves the double function of optionally locking the plow up or down, substantially as shown and for the purpose described.

10. In a wheeled plow, the combination of a suitably-supported frame A, lever G provided with spring-pawl 4 and pivoted at its forward end to the front of said frame, vertical axle 3, sleeve 2 seated loosely thereon and attached to said frame A, sleeve 5 seated on the lower portion of said vertical axle 3 and arm H pivotally attached at its lower end to said sleeve 5, quadrant J united integrally or otherwise to the upper end of said arm H and both said quadrant and said arm pivotally attached to said lever G on one common pivot whereby the longitudinal oscillations of the lever G raise and lower the front of the frame A and at the same time the quadrant J and arm H rise and fall in reference to said frame, substantially as shown and for the purpose described.

In testimony whereof we affix our signatures in presence of two witnesses.

SIMON A. KERNS.
FREDERICK A. HEAD.

Witnesses:
WM. H. BAUMANN,
H. H. HUBBARD.