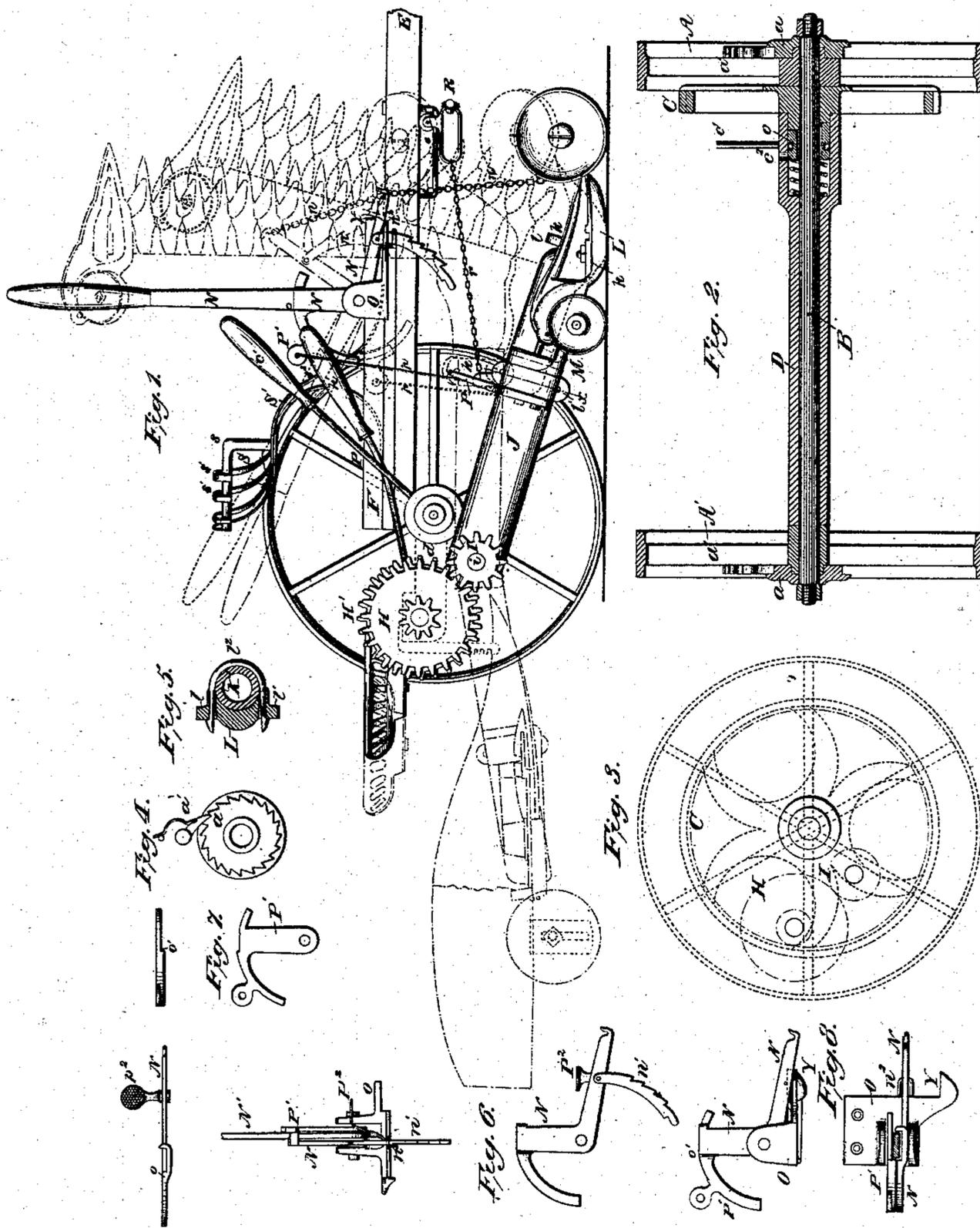


L. G. KNIFFEN.

Mower.

No. 67,885.

Patented Aug. 20, 1867.



Inventor:
L. G. Kniffen.
By his atty
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United States Patent Office.

L. G. KNIFFEN, OF WORCESTER, MASSACHUSETTS.

Letters Patent No. 67,885, dated August 20, 1867.

IMPROVEMENT IN HARVESTERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I L. G. KNIFFEN, of the city and county of Worcester, and State of Massachusetts, have invented certain new and useful Improvements in Harvesters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a view in elevation of my improved harvester. The red lines behind the main axle represent the reaper attachment, while the colored lines in front of that axle show the position of the parts when the cutting apparatus is raised and folded up.

Figure 2 is a vertical longitudinal section through the main axle.

Figure 3 is a diagram showing the gearing.

Figure 4 is a view of one of the backing ratchets.

Figure 5 is a vertical transverse section through the coupling-arm, at the line $x x$ of fig. 1.

Figure 6 shows the details of the lifting-lever.

Figure 7 shows similar views of part of the tilting-lever; and

Figure 8 is a plan or top view of the socket and lifting devices.

My invention relates to that class of two-wheeled hinge-joint harvesters which can be converted from mowers into reapers, and from front-cut to rear-cut machines, or *vice versa*, and more especially to machines in which the main frame, the gearing, and the driver's seat are all maintained in one relative position by a rigid tongue or shafts, while the cutting apparatus is so connected to the main frame by coupling-arms as freely to rise and fall to conform to the undulations of the ground over which it is drawn.

The improvements herein claimed consist, first, in a socket which acts as a support for the lifting-lever, and as a detent to hold the finger-beam when folded up; second, in combining with a right-angled lifting-lever a swinging ratchet to hold the cutting apparatus, as hereinafter described; third, in combining a lifting-lever and a swinging ratchet with the main frame and cutting apparatus, substantially as hereinafter described; fourth, in so combining a lifting-lever and a tilting-lever that the driver may, by a single movement, either lift the finger-beam horizontally or turn it up vertically, at pleasure.

In the accompanying drawings, which exemplify one convenient mode of carrying out my invention, two driving and supporting-wheels A A' are shown as turning loosely on the main axle B, to which suitable backing ratchets a are firmly secured, so as to turn with the axle. A tongue, E, is attached to the bed-piece, and supports a frame, F, which carries the lifting devices and driver's and raker's seats. The main gear-wheel C drives a corresponding spur-pinion on a counter-shaft mounted in brackets projecting from the bed-piece D, and carrying two spur-wheels H H'. These wheels are mounted loosely on the counter-shaft, and can be alternately thrown into or out of gear by a sliding-clutch and feather operated by a hand-lever, h' . They gear into corresponding pinions I I' on the crank-shaft, mounted in the same brackets so as to rotate parallel to the main axle. The wheel H is of a diameter greater than its fellow, while the corresponding pinion I is of less diameter than its fellow, so that by changing from one set to the other the speed of the cutters can be increased or diminished at pleasure to adapt the machine to the change from a reaper to a mower, or *vice versa*. A coupling-arm, J, is pivoted to the bracket d in line with the crank-shaft i , and is curved in the peculiar form shown in the drawings. The coupling-arm is braced by a diagonal lever pivoted to a down-hanger secured to the bed-piece D. The finger-beam K is pivoted to the coupling-arm by means of a shoe, L, formed of the peculiar shape shown in the drawings, and having a loop, l , to fit on a corresponding stud, k , on the coupling-arm, and a yoke or fork, l' , to encircle the tubular part k' of the coupling-arm, through which the pitman M passes. The fork is clasped upon the coupling-arm by a bow-spring, l'' , which slips into loops on the yoke, and is held by square shoulders on its ends, as clearly shown in figs. 1 and 5. By this means the finger-beam and coupling-arm are firmly connected so as to resist lateral strain, while the finger-beam is free to swing round the coupling-arm to allow either end to rise or fall to conform to the undulations of the ground. The cutters are vibrated by means of a bell-crank or elbow-lever pivoted to play horizontally on the shoe L, and driven by the pitman M. The cutting apparatus is raised or lowered by means of a bell-crank lever, N, pivoted to play vertically in a socket, O, attached to the inner front corner of the frame. The toe of this lever is connected to the finger-beam by a cord

or chain, *n*. A swinging ratchet, *n*¹, is likewise hung to this toe by its upper end, so as to pass through a loop, *n*², in the bracket. As the lever rises the ratchet rises endwise through its loop, and its gravity causes it to swing forward, so that when the lever is released the teeth abut against the front part of the loop and prevent the descent of the finger-beam. The ratchet is released from the loop by the foot of the driver acting on a treadle, *P*². The hand-lever *N*¹, which works the lifting-lever, is not permanently attached thereto, but is pivoted concentrically with it, and works against a shoulder, *o*, on it, so that by first moving the hand-lever laterally a little way, it can be vibrated without affecting the lifting device. The above-described device lifts the finger-beam horizontally only. In order, however, to lift its outer end, so as to fold it up against the main frame, I attach an arm, *P*, to the shoe *L*, in rear of but parallel to the finger-beam, and connect said rod by a link, *p*, to a curved rocking-lever, *P*¹, vibrating on the same pivot as the hand-lever *N*¹, and moving both concentrically and parallel therewith. The hand-lever *N*¹ abuts against a shoulder, *o*¹, on this rocking-lever similar to that on the lifting-lever, and can thus be made to act upon it at pleasure. By moving this lever backward the outer end of the arm *P* is depressed, while the divider end of the finger-beam is correspondingly elevated, the coupling-arm *J* serving as a fulcrum. I am thus enabled to lift the outer end of the finger-beam and to raise it horizontally by the use of a single lever. When thus raised the finger-beam can be caught by the hook *Y* on the plate *O*, and thus held up for transportation, (see fig. 8.) The horses are attached to a double-tree or evener, *R*, which is connected by a chain, *r*, to the brace-rod, and slides in a loop, *e*, underneath the tongue. By this device the pull of the team tends to lift the cutting apparatus and thus diminish its pressure upon the ground. By adjusting the rear end of the chain higher or lower, which can readily be done by a short post on the brace-bar, the angle of the draught, and consequently the lifting strain exerted, can be varied at pleasure.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The socket-plate *O*, constructed to act both as a support for the lifting and tilting mechanism, and as a detent to hold the finger-beam vertical when folded for transportation, substantially as described.
2. The combination of the lifting-lever with the swinging ratchet, arranged and operating as described.
3. The combination and arrangement, substantially as described, of the socket, the lifting-lever, and the swinging ratchet with the main frame and cutting apparatus.
4. The combination, substantially as described, of the lifting-lever, the tilting-lever, and the hand-lever, for the purpose of either lifting or tilting the cutting apparatus.

In testimony whereof I have hereunto subscribed my name.

L. G. KNIFFEN.

Witnesses:

GEO. A. KIMBALL,
WM. S. BICKFORD.