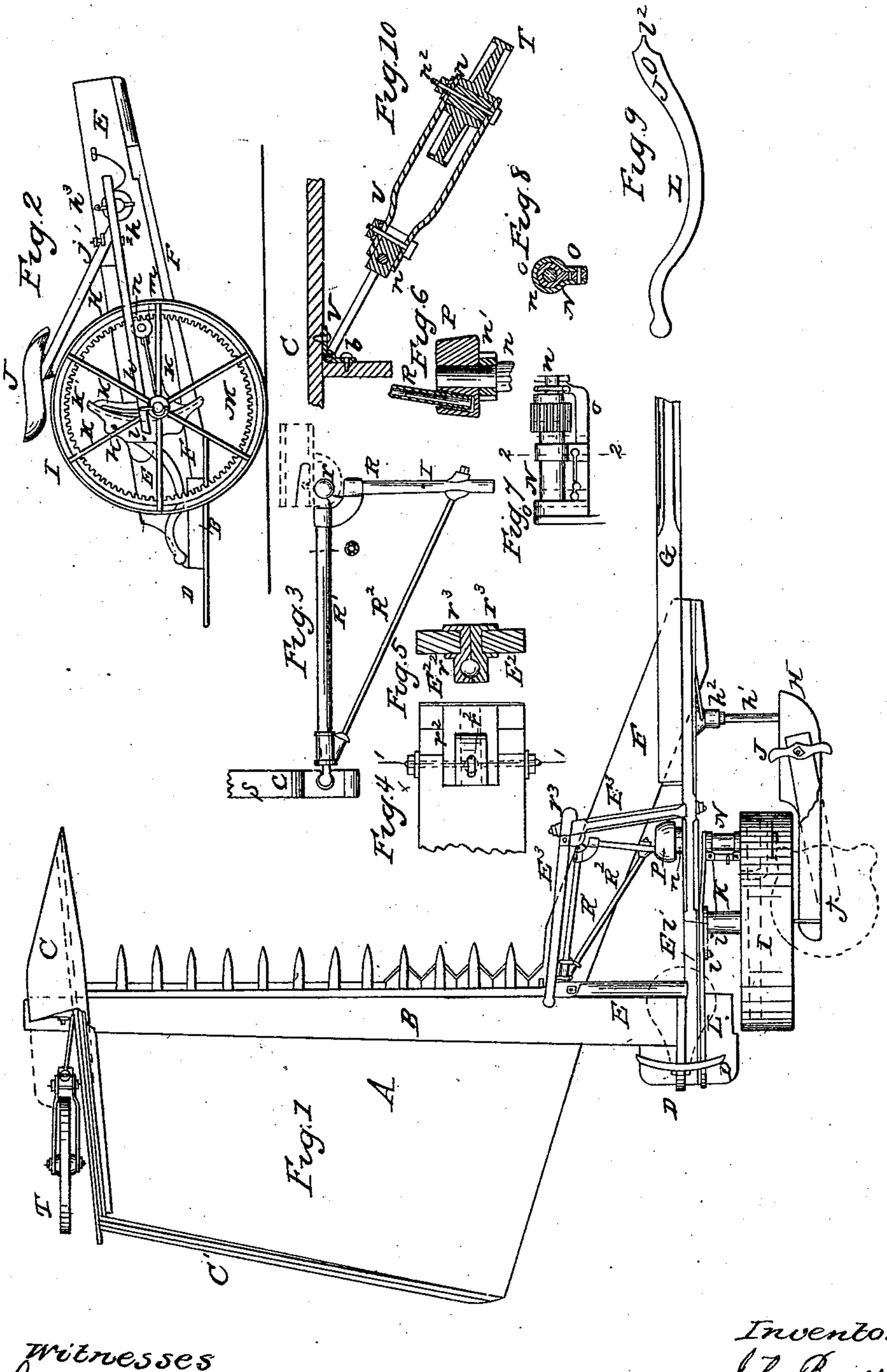
J. BARNES.

Harvester.

No. 85,722. Patented Jan'y 12, 1869.



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UNITED STATES PATENT OFFICE.

JOHN BARNES, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. 85,722, *dated January* 12, 1869.

To all whom it may concern:

Be it known that I, JOHN BARNES, of Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Harvesters, of which the following is a full, clear, and exact description.

It is the object of my invention to secure an efficient harvester combining the desiderata of simplicity, strength, lightness of draft, and easy-working gearing; to which ends the improvements herein claimed consist, first, in a novel method of constructing the frame of the machine, so that it may readily be taken apart for transportation, or be set up quickly for working; second, in a novel method of raising and lowering the machine from the raker's position; third, in a novel method of constructing the gearing.

In the accompanying drawings, which show one practical way of carrying out the objects of my invention—

Figure 1 represents a plan or top view of so much of a harvester embodying all my improvements as is necessary to illustrate the invention herein claimed. Fig. 2 represents a view in elevation of the same, as seen from the stubble side, with the raker's stand, platform, and tongue removed. Fig. 3 represents a plan or top view of the sickle-driving mechanism. Fig. 4 represents a view in elevation of the socket-clamp on which the sickle-driver oscillates. Fig. 5 represents a vertical section through the same at the line 1 1 of Fig. 4. Fig. 6 represents a horizontal section through the crank-wheel. Fig. 7 represents a plan view of the counter-shaft, pipe-box, and shipper detached. Fig. 8 represents a transverse section through the same at the line 2 2 of Fig. 7. Fig. 9 represents a view of the lifting-lever detached, and Fig. 10 a horizontal section through the grain-wheel and its supports.

The platform A is secured to the finger-beam B by braces underneath the finger-beam, in such manner as to admit of its easy removal and replacement. The platform is also provided with a divider, C, and fence or guard-board C′. A stand, D, is mounted on the end of the finger-beam for the support of a raker, who straddles the saddle of the stand and rests his feet upon a foot-board, D′. The main or gearing frame consists mainly of a longitudinal side piece, E, intersecting the finger-beam at a right angle, and being rigidly bolted upon its upper side. A diagonal brace, F, connects the front part of the side piece E with the finger-beam. Three timbers, E^1 E^2 E^3, are secured to each other, to the side piece E, to the finger-beam, and to the diagonal brace, by through bolts and nuts, so as to form a strong quadrangular frame. The tongue G is bolted rigidly to the side piece E, but may be rendered adjustable in well-known modes. The rear end of the outer frame-timber H is embraced by a loop, *h*, on the linch-pin, which holds the driving-wheel I on its shaft. An arm, h^1, projecting at right angles from the front end of this timber, enters a socket, h^2, projecting from the side piece E. A pin, h^3, passes down through a hole in this socket and through the arm, and locks them firmly together. The driver's seat J and foot-rest *j* are mounted on this outer timber H. By the above-described mode of construction, the frame may be readily taken apart and put together, as by drawing out the pin h^3 the driver's seat, the outside frame-piece H, and and the driving-wheel may all be detached from the machine.

The driver's seat may be set farther forward or back by inserting its retaining-bolt *j′* in one or the other of a series of holes in the frame-piece H, and it may be adjusted laterally by turning the support of the seat on the same bolt.

The driving-wheel I runs on a spindle, *i*, projecting from a radius-bar, K, oscillating upon the socket or pipe-box of the counter-shaft. The back end of this radius-bar moves in a curved guide, K′, fixed on the frame. A lifting-lever, L, is provided with a slot, *l*, Fig. 9, which works on a fulcrum, l^1, and with a nose, l^2, which takes into the teeth of a rack on the back of the section to lift the frame. A detent, *k*, also takes into this rack and holds the frame at any height to which it may be lifted by the lever. The slot *l* allows the lever play enough to prevent its binding, and also to clear itself on the return stroke.

The lever, it will be observed, extends backward to the raker's position, and is intended to be worked by him instead of by the driver, as has heretofore been the case.

An internally-geared spur-wheel, M, on the

driving-wheel, drives a corresponding pinion, *m*, on the counter-shaft *n*, which revolves in a pipe-box or tubular socket, N, and carries a crank-wheel, P, on its inner end. A pinion, *n'*, on this shaft may be used to drive an automatic rake, if desired.

The mechanism is thrown into or out of gear by means of a yoke, O, supported on collars *o*, sliding on the pipe-box N, and entering a groove in the collar of the pinion *m*. This pinion moves loosely on the counter-shaft, but is connected with it by means of a clutch, formed by a pin in the counter-shaft entering a slot in the pinion. When the pinion is moved endwise into the position shown in Fig. 7, the pinion is disconnected from the counter-shaft, and the mechanism is out of gear. The pinion is held in or out of gear by a pin, which enters a notch, *o'*, in the pipe-box and yoke. The counter-shaft is secured in the box by a pin or key, which forms the clutch for the pinion, as above mentioned, by moving which the radius-bar and main axle may be slipped off the socket N. The counter-shaft may also be removed.

A crank-wheel, P, on the inner end of the counter-shaft, drives the cutter by means of an oscillating triangle hereinafter described. This triangle consists of two arms, R R^1, arrangedat right angles to each other, and connected by a brace-rod, R^2, provided with a tightening-screw to keep the frame at a proper tension.

The arm R, as shown in Fig. 6, is, by preference, made hollow and filled with wicking or waste. Oil is poured into this hollow through an opening, *r*. The open end of this arm is inserted in a socket in the crank-wheel P, near its periphery. The arm is thus carried round in a circle, and the centrifugal force thus generated tends to force the oil out at that end, and thus keep the joint well lubricated. It will be observed that the socket in which the arm plays is inclined, so that its inner end is farther from the center than the outer end, consequently the centrifugal force generated by the rotation of the crank-wheel tends to retain the oil at the inner end of the socket and prevent its waste.

A ball, r^1, at the apex of the triangle, is clamped between two sockets, r^2, provided with flanges r^3, which are inserted in a slot in the frame-timber E^2, as shown in Figs. 1, 4, and 5, and are thus securely held without other fastenings. This forms a ball-and-socket joint, on which the triangle works.

The arm R^1 is also tubular. A rod, *s*, is inserted in its lower end. A head on this rod fits in a socket in the cutter-bar S, and is held down by a guide, in which the cutter-bar slides. This rod slides endwise back and forth in the arm to compensate for its circular motion. By my peculiar mode of driving the sickle several advantages are attained. As the arm R is carried around by the crank-wheel it describes a cone, and owing to its peculiar relation to the counter-shaft all dead-centers are avoided. The ball and socket r^1 has a compound oscillating rocking movement to accommodate this motion of the arm R, and the lower end of the arm R^1 moves in the arc of a circle. The variation in its distance from the cutter-bar thus occasioned is compensated by the sliding movement of the rod *s* above mentioned.

It is obvious that, by making the arms R R_1 sufficiently rigid, the brace-rod R^2 might be dispensed with. An elbow lever-would be thus formed. This mode of construction would be advantageous under some circumstances, as it would require less space in which to work, and thus admit of greater compactness in the arrangement of the gearing and mechanism.

The divider-end of the finger-beam is supported on a caster-wheel, T, mounted in a yoke, U, swinging on a vertical pivot, *u*, in a forked bracket, V, pivoted at *v* to the divider, so as to swing horizontally. This prevents the wheel from cutting into the ground when turning. The angle of the yoke to the bracket can be varied vertically to set the finger-beam higher or lower. The yoke U consists of two parallel arms. A cylinder, n^1, either of wood or metal, is placed inside the hub of the wheel. The cylinder, by preference, fits into recesses on the inside of the yoke-arms, and is made slightly longer than the hub. A bolt and nut, n^2, passes through this cylinder and locks the parts firmly together. The cylinder is kept properly lubricated in any well-known way. By this mode of construction the yoke-frame is rendered rigid, as the cylinder n^1 remains stationary and the hub revolves on it. As the cylinder is apt to wear unequally, it can be turned at any time by loosing the bolt.

It will be observed that the tongue of my machine is arranged far within the plane of the driving-wheel, which arrangement diminishes the side draft.

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

1. The combination, with the finger-beam, of the quadrangular frame and diagonal brace, as and for the purpose set forth.

2. The combination of the radius-bar with the slotted lifting-lever and detent, as and for the purpose set forth.

3. The combination of the counter-shaft and pinion, the pipe-box, and the sliding yoke, with the locking-pin for holding the pinion in or out of gear, as set forth.

4. The oscillating triangular frame for driving the cutters, substantially as set forth.

5. The combination, with the counter-shaft, of the crank-wheel and oscillating frame, substantially as and for the purpose set forth.

6. The combination of the angular socket in the crank-wheel with the tubular arm, also inclined to the counter-shaft, substantially as described, whereby waste of oil is prevented.

7. The method herein described of clamping the ball in the sockets r^2, by inserting the flanged sockets into a slot in the frame-timber.

8. The combination, with the cutter-bar, of the rod working endwise in the tubular arm or pitman which drives it, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

JOHN BARNES.

Witnesses:
JOE I. PEYTON,
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