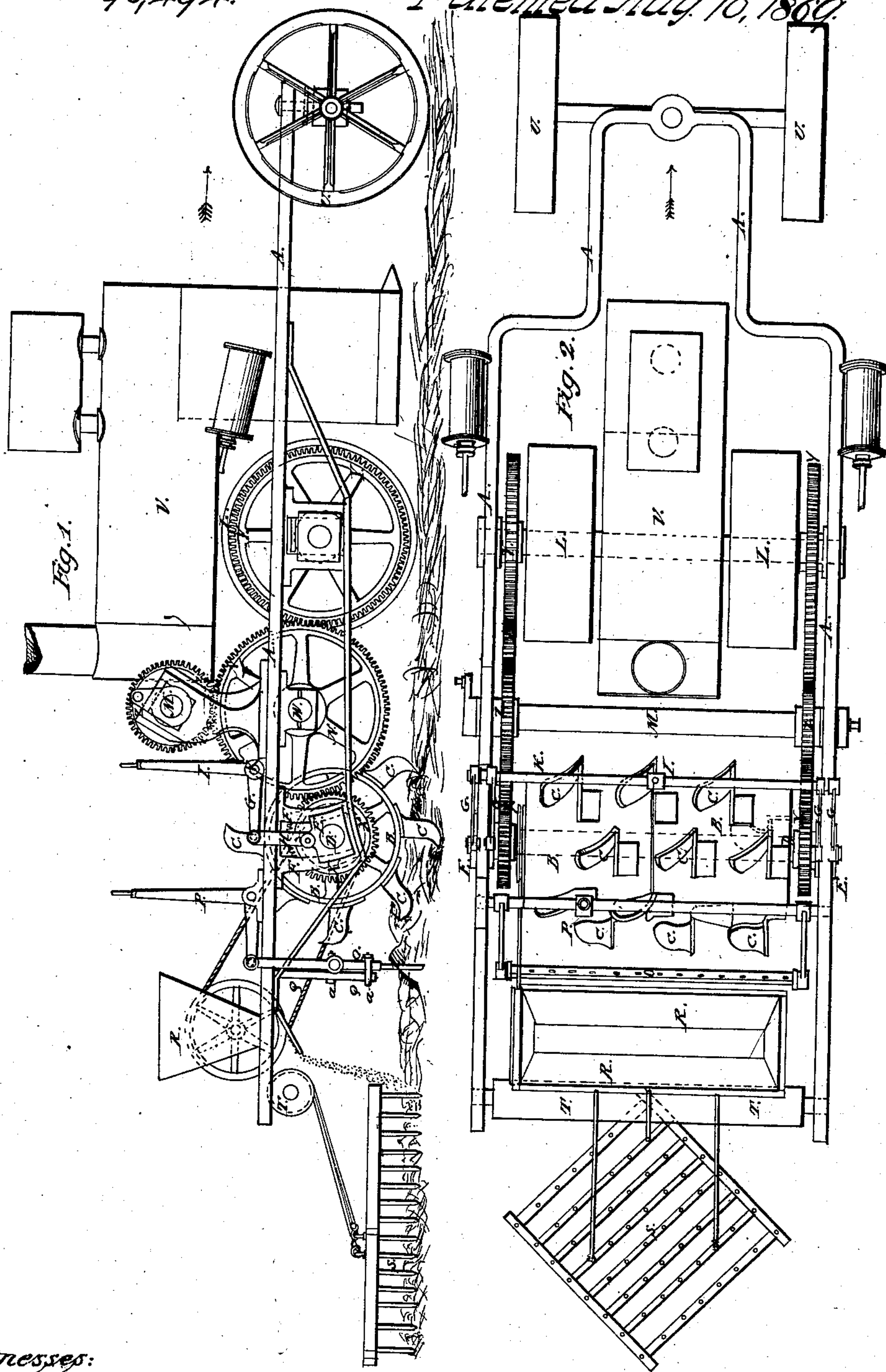


A. J. Stevens. Steam Plow.

No 93,494.

Patented Aug 10, 1869.



Witnesses:
George Parry
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ANDREW JACKSON STEVENS, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 93,494, dated August 10, 1869.

IMPROVEMENT IN STEAM-CULTIVATOR.

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, ANDREW JACKSON STEVENS, of the city and county of San Francisco, and State of California, have invented a certain new and improved "Steam-Cultivator," for plowing, sowing, and harrowing farming-lands; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and letters of reference marked thereon, in which—

Figure 1 is a side elevation, and

Figure 2 is a plan or top view.

My invention consists in a combination of parts, which, separately, perform the operation of, first, plowing the ground; secondly, cutting and dividing the clods of earth as they are plowed up; thirdly, sowing or seeding the ground; and, lastly, harrowing the soil; the whole of the moving parts being driven, and the entire machine propelled by steam-power.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, as follows:

Within a suitably-shaped frame, A, of either wood or iron, and occupying the position relative to other parts, as shown in the drawing, I will set the revolving cylinder B.

This cylinder will have, on its outer surface, a series of plows, C, adapted to be secured to the cylinder, but not otherwise materially differing, in shape or construction, from plows in common use.

These plows C will necessarily have a peculiar setting on the surface of the cylinder B, which will be evident when it is considered that the plows are to plow a continuous furrow, and not leave any part of the ground unevenly worked.

In explanation of this manner of setting the plows, I would suggest that radial lines, drawn from the axis of the cylinder to the points of the plows, shall equally subdivide the complete circle with as many subdivisions as there are plows on the cylinder; and, further, commencing at one end of the cylinder, and taking the first circle of plows, let us assume an initial point in this circle. Then, the next adjoining circle of plows will have its corresponding initial point advanced in the circle a distance equal to the full circle divided by the number of circles of plows there will be on the cylinder. Similarly, the next circle of plows will have a corresponding further advance, and so on to the end.

For example, let us suppose there to be six circles of plows on the cylinder. Then the first circle will have its initial point at, say, 0; the second circle will have its corresponding initial point at, say, one-sixth of the circle advanced; the third circle, two-sixths advanced; the fourth circle, three-sixths advanced; the fifth circle, four-sixths advanced; and the sixth circle, five-sixths advanced.

With this manner of setting the plows, it will be obvious that an equal strain will be obtained on the machine when it is in operation, and the plows will enter the ground in precise and regular order, no two plows entering at the same time.

The shaft or axle D, of the cylinder B, will revolve in boxes or bearings, E, which slide up and down in the pedestals F.

These pedestals are secured to the main frame A, and will form an arc of a circle, struck from the centre of the intermediate shaft W, so that when the plow-cylinder is raised or lowered, the wheels N and X will always have their centres relatively the same distance apart, and will, therefore, remain in gear.

The boxes or bearings E will depend from the links H, which connect with the arms G, which project from the shaft K, which shaft, when vibrated by the handle I, operates in raising or lowering the plow-cylinder.

The plow-cylinder, by a system of gearing, is connected with and revolved by a pair of engines, set, one on each side of the frame A, as shown in drawings.

It is not esteemed necessary to enter into the detail of construction of the parts of these engines, and the boiler V, which supplies them, for they are well-known devices, and there will be nothing new either in their application or construction, in connection with my invention, which I desire to note.

A pair of driving-wheels, L, has place in the frame A, forward of the plow-cylinder, which, by a system of gearing, also connects with and are driven from the engine-shaft M. The axle carrying these driving-wheels will be supported in boxes held in pedestals secured to each side of the frame A, in manner as shown in drawing, and an India-rubber spring placed in the pedestal, over the axle-box, will serve to prevent any jolt or jar.

The system of gearing above referred to will be of such proportion as that the plow-cylinder may be revolved at, say, about twice the speed of the driving-wheels; this, for the purpose of allowing the plows to operate to some extent in propelling the machine forward.

The gearing will be arranged as follows:

Referring to the figures of the drawing, Z Z are the pinions on the engine-shaft, of, say, proportionate diameter, as one; N N are the intermediate gears, of, say, proportionate diameter, as two; X X are the gears on the plow-cylinder, with diameter as one; and Y Y are gears on the axle of the driving-wheels, with proportionate diameter, as two. By these proportions, for every two revolutions of the engine and plow-cylinder, the driving-wheels will make but one.

Immediately behind the plow-cylinder, is provided a series of knives, set in a frame, O, capable of being

raised or lowered by the hand-lever P, in similar manner as adopted with reference to the plow-cylinder.

The frame which carries these knives will be of simple construction, and will consist of a couple of wooden bars tied together by end pieces. The knives will be strapped to this frame, or in any suitable way secured thereto. The frame will be made to slide up and down on the guide-bars Q, and the strap-bolts a serve to secure the frame to the guide-bars.

Back of these knives, I will set a "seeder," R, of almost any pattern now in use, and suitable in the case. I will not enter into a description of this seeder, for it does not properly constitute a part of my invention, but its use is suggested as a convenience, and desirable to be adopted. I will simply say that a seeder may be set on the frame A, in the rear of the plow-cylinder, which may be driven from the plow-cylinder shaft, or otherwise, as may be found best.

Behind this seeder, and dragging after the machine, may be a harrow, S, of common construction. This harrow will be dragged through the soil by ropes or chains attached to and wound round the wooden roller T. By turning round this roller, either by a hand-crank fitted on end, or by inserting a bar in socket-holes, which may be cut in the roller, the ropes or chains may be wound up, and the harrows lifted from the ground when not in use.

In front of the machine will be the steering-wheels U. The axle carrying these wheels will be secured, by a king-bolt, to the main frame A, and a concave and convex washer, such as is commonly used on railroad-car tracks, will intervene between the axle and the frame, so as to allow the required play for the axle, when one wheel, striking high ground, leaves the other in a hollow place.

The means used for steering the machine may be similar to a ship's steering-rig, and as follows:

Two ropes or chains will be secured to each end of the axle, and, passing through guide-blocks, will be wound around a wooden roller, with a hand-wheel on end to turn it by; so, when the wooden roller is revolved, it gives off one rope and takes on the other, thus letting forward one wheel, whilst bringing back the other. The machine is in this manner directed.

Another means of steering may be to secure a segment of a gear-wheel to the axle, and operate to turn round the axle and steering-wheels, by having a pinion-gear engaging with the segment-gear, and which may be revolved by a hand-wheel on the upper end of a vertical shaft, to the lower end of which the pinion would be secured, the vertical shaft itself being secured to the main frame.

However, the particular means to be adopted for steering need scarcely be specified, for there are many

means equally applicable, and I shall not claim the steering-rig as part of my invention.

I may, if I wish, provide a means of throwing in and out of gear, any one separate, or all the gear-wheels on my machine; as, for instance, I may wish to run the driving-wheels and not the plow-cylinder; or, I may wish to run the engine alone, when pumping up the boiler; or I may wish to drag the machine from place to place by horses, &c.

The means I shall adopt for this purpose will be the common and well-known jaw-clutch, which, engaging with the hub of the gear to which it is applied, is thrown in and out by a hand-lever, the clutch sliding on a feather on the shaft, and the gear-wheel being loose. The device is well known to those practised in the art.

The machine will be covered in by a suitable platform of wood, which is not shown on drawing, because it would hide the parts; and a water-tank may be provided, if found convenient.

The operation of my invention is as follows:

Steam is generated in the boiler, and the engines supplied therefrom, which, when set in motion, revolve the system of gearing, which revolves the driving-wheels and the plow-cylinder, the effect being to propel the machine forward, and, at the same time, to plow up the soil in a most thorough manner.

The knives set in the frame will act, as before suggested, to cut up and divide the clods, and the seeder will scatter the seed, and when the harrow is used, it will operate to cover up the seed and level off the ground.

It will be observed, that since the plow-cylinder will revolve at double the speed of the driving-wheels, it will necessarily act to propel the machine, as well as to plow the ground.

I disclaim any novelty in the harrow or seeder, or in the application thereof in this case; but

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

1. The revolving plow-cylinder, having the plows secured thereon, and adjustable in the pedestals, and the system of gearing transmitting motion between the engines, the plow-cylinder, and the driving-wheels, in combination therewith, substantially as herein described, and for the purposes as set forth.

2. The adjustable frame of knives, (set in rear of plow-cylinder,) which slides up and down on the guide-bars, constructed substantially as herein described, and for the purposes as set forth.

ANDREW JACKSON STEVENS.

Witnesses:

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EDMUND S. FLYNN.