O. A. OLMSTED.

CULTIVATOR.

No. 191,996. Patented June 12, 1877.

Fig. 1

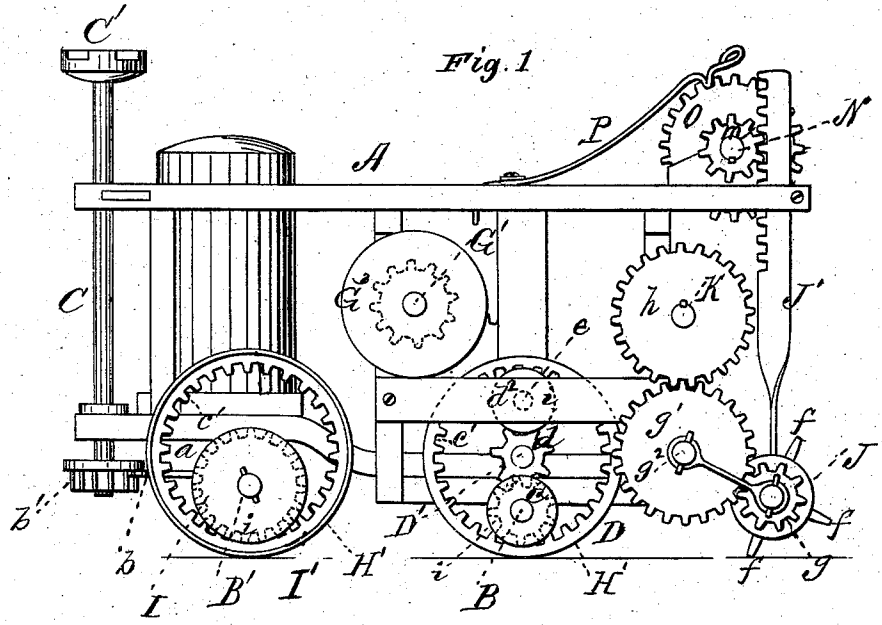
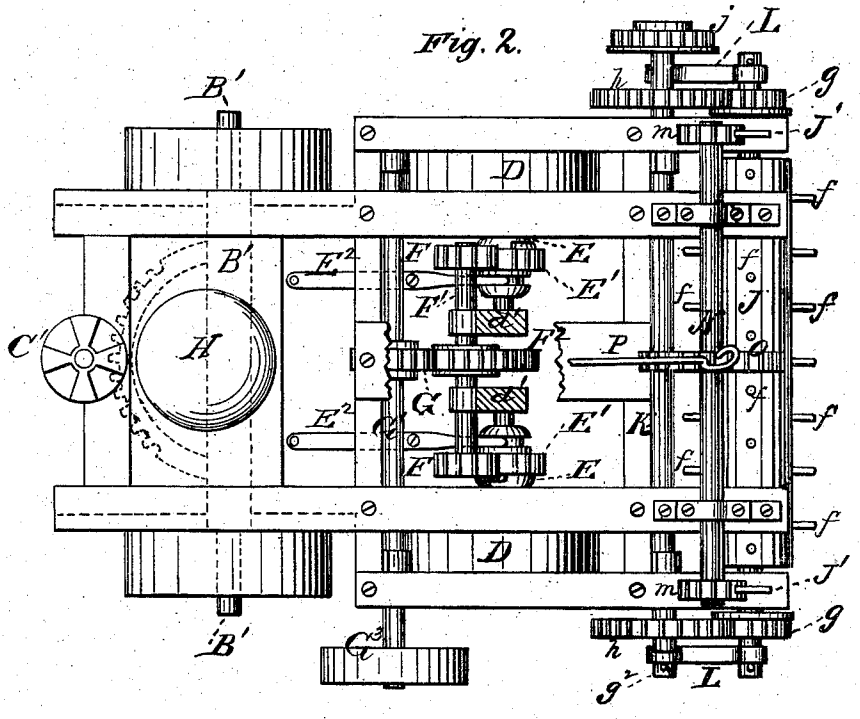


Fig. 2.



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UNITED STATES PATENT OFFICE.

OLIVER A. OLMSTED, OF SANTA ROSA, CALIFORNIA.

IMPROVEMENT IN CULTIVATORS.

Specification forming part of Letters Patent No. **191,996**, dated June 12, 1877; application filed March 14, 1877.

To all whom it may concern:

Be it known that I, O. A. OLMSTED, of Santa Rosa, in the county of Sonoma and State of California, have invented a new and valuable Improvement in Cultivators; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my invention, and Fig. 2 is a top view thereof.

This invention has relation to improvements in combined steam-cultivators and traction-engines.

The object of my invention is mainly to devise means for regulating the speed of the traction-wagon and that of the cultivator, so that the latter may be driven at great speed and the former carried over the ground at a slow rate in heavy, stiff lands, thereby thoroughly pulverizing and breaking up the soil, or the reverse in light, loamy lands, and to prevent the track-wheels of the wagon from burying into the ground in wet or bottom lands, or in sandy soils.

It consists in combining with the cogged traction-wheels proper of a traction-wagon detachable interiorly-cogged fellies, engaging with the said wheels, and having removable tires, whereby I am able to adapt to the fellies a tire of a width suited to the condition of the soil.

It also consists in certain other minor details of construction, as will be fully understood from the following description.

In the annexed drawings, the letter A designates the frame or body of my improved traction wagon and cultivator, provided at its front end with an ordinary axle-tree, B′, secured within the slotted front end of the central longitudinal beam *a* by a king-bolt, and provided with a spurred fifth-wheel, *b*, that engages with a pinion, *b′*, on the lower end of a vertical shaft, C, at the front of the frame. This shaft has on its upper end a hand-wheel, C′, by means of which the wagon is steered.

The rear axle B has on each end a lantern-wheel, *c*, that engages with a broad-tread track-wheel, D, having its teeth formed on a raised ring or ridge, *c′*, that fits into the space between the flanges of the said lantern-wheel. The latter also meshes with a spurred pinion, *d*, rigidly secured upon a short shaft, D′, having its inner bearings in one of the spaced uprights d^1 of the frame, which pinion engages with a second pinion, d^2, on a shaft, *e*, journaled in the frame side, the pinion d^2 engaging also with the track-wheel aforesaid. This latter is not applied upon a shaft, but secures its connection with the lantern-wheel and the upper pinion d^2 through the engagement of their teeth with the said wheel, and the fitting of the raised ridge or rings *c′* between their flanges *i*. Shaft D′ has rigidly secured thereon a clutch-head, E, with which a sliding gear, E^1, on the said shaft, forming the other head of the clutch, is caused to engage by means of a vibratory lever, E^2, working in an annular groove on the hub of the said gear. Gears E^1 are continually in engagement with pinions F on a shaft, F^1, having its bearing in the uprights d^1, and provided with a large gear, F^2, that engages with a smaller one, G, on a transverse driving-shaft, G^1. This shaft has on one end a driving-pulley, G^3, through which and suitable belts motion is communicated to it by a suitable engine, deriving its power from a steam-boiler, H, upon the front end of the frame. The track-wheels D I′ will be provided with broad removable tires H′, which will prevent the sinking of the said wheels into soft ground, and protect them from being injured by casual shocks in passing over rough or stony ground. The front axle B′ is likewise provided with lantern-wheels I, meshing with loose track-wheels I′, as above described, the said track-wheels being provided with the raised toothed ridge *c′*, fitting between the flanges *i* of the lantern-wheels.

By introducing a pinion meshing with the track-wheels and lantern-wheels, and connecting it with the driving-shaft by a suitable system of gearing, the lantern-wheels I may be converted, like those of the rear axle, into driving-wheels. J represents a cylindrical roller, having a number of parallel sets of spaced teeth, *f*, and suspended at the rear end of the frame by metallic racks J′. The said

roller is journaled in the lower ends of the racks, and provided at each end with a pinion, g, meshing with a gear-wheel, g^1, at each end of a transverse shaft, g^2, which is actuated by gears h upon a second shaft, K, engaging with the gears g^1 aforesaid to rotate the cylinder J.

Shaft K is provided upon one end with a driving-gear, j, that is actuated by an independent engine at its side of the frame through power derived from the steam-boiler H aforesaid. The journals of the cylinder are connected to the ends of shaft g^2 by means of links L, so that, when the said cylinder is raised or lowered to lessen or increase the penetration of its teeth into the soil, it will at any position have its pinions engaged with the gears g^1, and will be effectually actuated. The racks J′ aforesaid extend up through slots formed in the upper part of the frame, and engage with pinions M, applied, one at each end, upon a shaft, N. This shaft is rotated to adjust the cultivator-cylinder by means of a hand-wheel, O, keyed upon it, and by a sufficient rotation of said wheel the roller may be raised clear of the ground, and the wagon driven from place to place without obstruction therefrom.

The shaft N is prevented from casual rotation by means of a spring-pawl, P, secured at one end to the frame, and engaging with the other directly with the hand-wheel, as shown in the drawings, or with a ratchet-wheel keyed on said shaft or secured to the hand-wheel. The wagon being driven by an independent engine, as is also the cultivator, I am able to regulate the speed of one or both according to the nature of the soil. Thus, in stiff clayey ground, where the clods are difficult to break up, the wagon may be run at a slow rate and the roller at a very high rate of speed, subjecting the surface to be harrowed to reiterated strokes of the teeth, and thereby effectually breaking up the clods. In light sandy or loamy soil the wagon may be run at a rapid rate, as well as the roller, and yet effectually break up the clods; or the rotation of the roller may be lessened, according to the nature of the soil.

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

1. The track-wheels D I′, composed of the internally-toothed rings c', having removable tires H′ of broader tread than said rings, the edges of the said tire extending out beyond the adjacent edges of the rings, substantially as specified.

2. The track-wheel D, having a raised toothed ring, c', in combination with the lantern-wheels c d^2, the driven pinion d, its shaft D^1, the clutch-pinion E′, pinions F F, and gear-wheel F^2, the driving-pinion G, and driven shaft G′, substantially as specified.

3. The rotary cultivator-cylinder J, journaled in the lower ends of the vertical guided racks J′, in combination with the pinions m, engaging said racks, a hand-wheel, O, and shaft N, operating said wheel, and a spring-pawl, P, holding said pinion against backward rotation, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

OLIVER AUSTIN OLMSTED.

Witnesses:

JOHN BROWN,

W. H. MEAD.