

(No Model.)

2 Sheets—Sheet 1.

J. KILLEFER.
CULTIVATOR.

No. 503,145.

Patented Aug. 15, 1893.

Fig. 1.

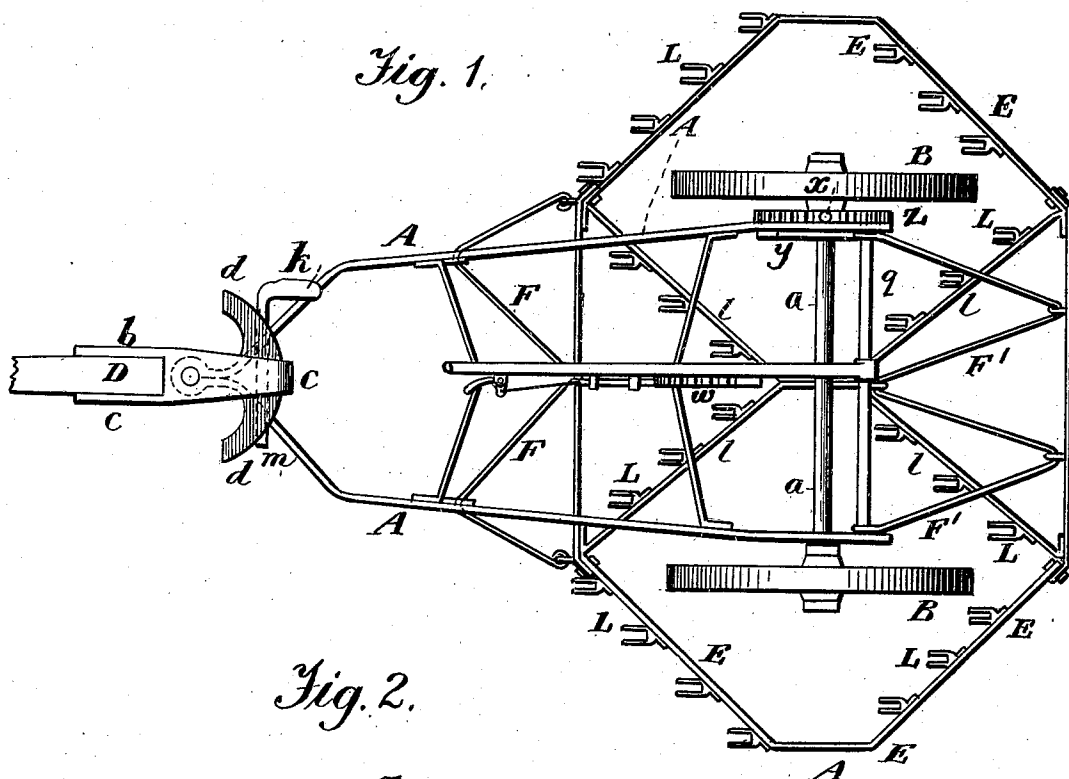


Fig. 2.

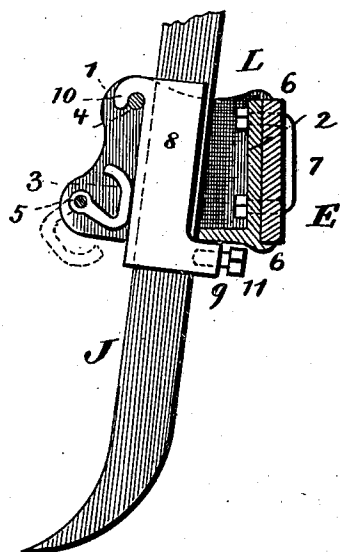
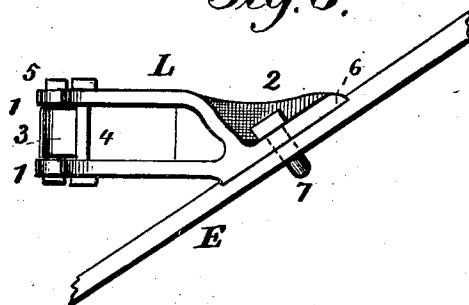


Fig. 3.



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2 Sheets—Sheet 2.

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Fig. 4.

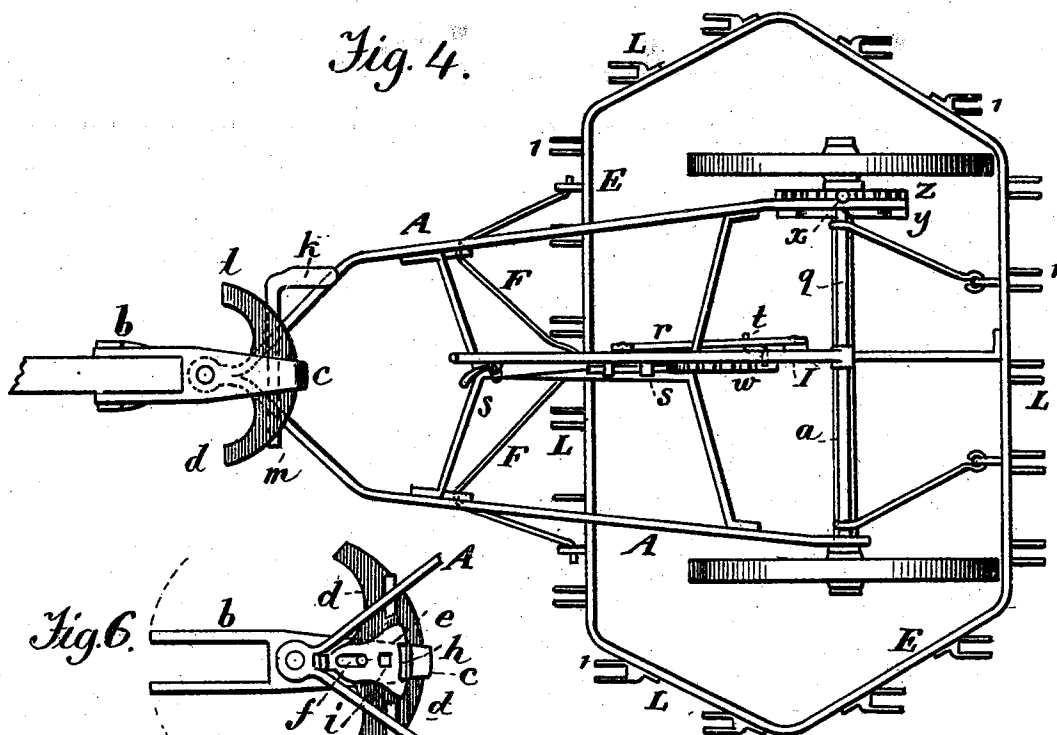


Fig. 6.

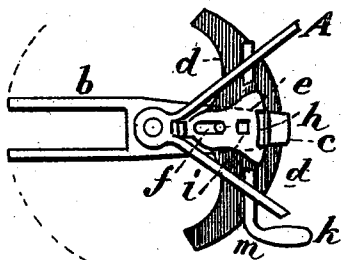


Fig. 5.

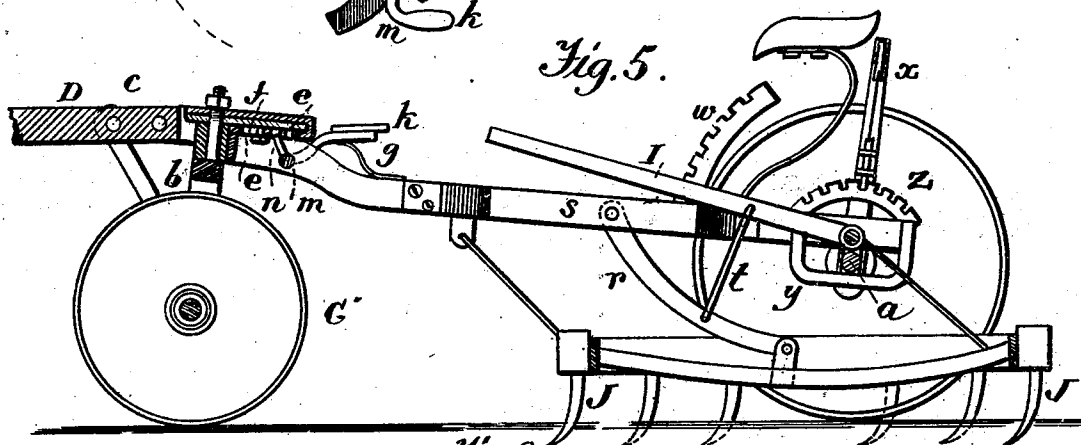


Fig. 8.

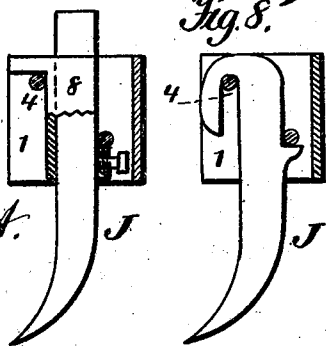
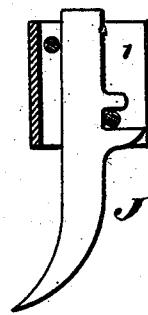


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN KILLEFER, OF REDLANDS, CALIFORNIA.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 503,145, dated August 15, 1893.

Application filed December 8, 1892. Serial No. 454,475. (No model.)

To all whom it may concern:

Be it known that I, JOHN KILLEFER, a citizen of the United States of America, residing at Redlands, in the county of San Bernardino and State of California, have invented certain new and useful Improvements in Cultivators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to cultivators and harrows, and consists in certain improvements in the construction of such machines as hereinafter described and claimed.

In the accompanying drawings—Figure 1 represents a plan view of a machine provided with my improvements. Figs. 2 and 3 represent the tooth and couplings in sectional and plan views. Fig. 4 is a plan view of a modified form of frame. Fig. 5 is a sectional side view of Fig. 4. Fig. 6 is an inverted plan view of the tongue connections. Figs. 7, 8 and 9 show different forms of teeth.

A designates the main frame, the rear end of which is connected with the axle *a* of two rear, carrying wheels B, the front of said frame being supported by a single wheel C. The side bars of said frame converge to the front end where they are loosely connected with a bifurcated standard *b*, in which is pivotally mounted the forward wheel C.

To the standard *b* is made fast the tongue plate *c* which is bifurcated to receive the tongue D and is bolted thereto. A segmental plate *d* is fastened to the frame A, where the latter connects with the standard *b*, and forms a bearing for the plate *c*; the upper part of the standard *b* forming a rod or stud which passes through the parts *c* and *d*. The rear end of the plate *c* is bent to hook over the segmental plate *d*, the plate *c* having a lateral movement on the plate *d*.

To the lower side of the plate *d* is loosely secured a sliding plate *e* which has a guide formed of a fixed pin and slot *f*. The said plate *e* has an excision or notch *h* in its rear edge to connect with the tongue plate *b* when the plate *e* is moved backward. An aperture *i* is made in the sliding plate *e* to receive a tooth or stud *n*, on a shaft *m* mounted in the fore part of the frame A. Extending from the shaft *m* at one end is a foot piece *k*, and

by pressing the latter downward, the stud *n* engaging plate *e*, the said plate may be moved backward into connection with the hook end of the tongue plate *b*, so that the latter is locked to the plate *d* and the tongue D is firmly held in line with the machine. The plate *e* may be kept in its forward position, out of connection with the tongue plate *b*, by means of a spring connected with the foot piece, as seen at *g*, and when thus out of such connection, the tongue and the wheel C, which is always on a vertical plane with the tongue, may be readily turned to the right or the left of the line of draft.

E indicates a frame which carries the teeth of the harrow or cultivator, said frame being provided with diagonal bars, as seen at *l*, to which the tooth couplings may be secured as hereinafter set forth. The frame E is connected at the front with the frame A by a W-shaped draw-bar F, which is connected at two points with the frame A and at three points with frame E as shown in Fig. 1. The said draw-bar is made in one solid piece, and a similar bar F', having the W-shape, connects the rear bar of the frame E with a cross-bar *q* of the frame A. The said bars F, F', from their form and connection with the frames A and E, serve to brace the frame E in position parallel with the ground surface and tend to prevent the rising or depression of either side of the frame E during operation. The frame E is connected also with the frame A by a connecting bar or rod *r*, having pivotal connections with a central bar *s* of the main frame A and a central bar of the frame E.

I indicates a lever extending from and loosely connected with the rear cross-bar *q* of frame A, said lever being also loosely connected by a rod or link *t* with the curved connecting rod *r*. By this construction of the frame E and its connections with the frame A and the lever I, the frame E may be raised by a movement of said lever and at the same time held in position parallel with the surface of the ground, so that the teeth attached to the front and rear parts of frame E may be kept uniformly on the same plane during operation. The frame E may be adjusted in elevation by means of a rack *w* and a spring bolt connected with lever I. One end of the

axle *a* is loosely connected with the frame A by a widened loop or slot *y*, so as to have a lateral movement, such movement being effected by means of a pivoted lever *x* which is connected with the axle. By a movement of the lever *x*, forward or rearward, the machine may be readily steered either to the right or left, as may be desired, when the machine is passing too near a row or a tree; and such change in the direction of movement may be effected without turning the draft animals. When the axle *a* is thus turned from its normal position, it may be secured by a spring-bolt connected with the lever *x* and rack *z*; and by the same means the axle may be secured in its usual position.

J indicates the teeth, the points or working parts of which may be formed either for a harrow or a cultivator, and said teeth are each removably connected with a bar of the frame E by a coupling L. This coupling is formed of two lugs 1, extending from a base 2, a bent, pivoted dog 3 and cross-bolts 4 and 5 which connect the forward parts of said lugs. The base 2 has projections 6, on its upper and lower edges, to lap on a bar of the frame E, to which the coupling may be secured by a clip 7.

As cultivating teeth get rapidly worn, working in some soils, the teeth J are made with long shanks, so that they may be adjusted in length as they become worn. For the purpose of such adjustment, a hollow head 8 is formed of malleable iron to be placed on the shank of the tooth, the head fitting about the shank. The rear part of the head 8 is left open, except at the lower part which surrounds the shank of the tooth at 9 and forms a bearing piece to set against the coupling L. The head 8 is provided with a forward projection or hook 10, at the top, to hook on the cross-bolt 4, and the head may be secured to the tooth by a set screw 11. The dog 3 is connected with the lower bolt 5 and may be turned over backward to bear against the head 8 to secure the tooth in the coupling; and it may be pulled over forward when it is desired to remove the tooth. In adjusting the tooth in the coupling, it is first inserted the proper distance through the sleeve or head 8 and secured thereto by the set screw; then insert the tooth upward in the coupling, holding the point as far forward as practicable, and hook the upper end of the head to the upper bolt 4, and let the head swing back so that the projection or bearing piece 9 connects with the lower edge of the coupling. The dog 3 is then turned over back and pressed down against the head 8, and the tooth is thus rigidly secured in position. The tooth may be readily removed from the coupling L, the dog 3 being pulled over forward, when the tooth may be swung forward and unhooked from the bolt 4 and drawn downward and out from the coupling.

For connection with the diagonal bars of

the frame E, the coupling L may be made with its base 2 in a diagonal position and the lugs 1 extending directly forward, as seen in Fig. 3. The clips 7 may be loosened and the couplings holding the teeth may be moved along on the frame bars and secured in position nearer to or farther from each other as desired.

In Figs. 4 and 5, is shown a modified form of the tooth-bearing frame E, this form being adapted for cultivators of small size for use in small orchards, &c.

In Figs. 7, 8 and 9 are shown modified forms of tooth and coupling. The tooth is shown in Fig. 7 with its sleeve or head 8, supported by the upper bolt 4, between two lugs to be secured to a bar of the frame E, a projection rearward, on the lower end of said head, bearing upward against another cross-bolt. In Fig. 8, the tooth is shown without the head 8, but provided with a hook to connect with the upper cross-bolt 4 and a rear projection to connect with a rear cross-bolt. In Fig. 9, the coupling is formed of two lugs, made to extend rearward from a bar of the frame, and the tooth bears against the upper cross-bolt and has two rear projections to connect with the lower, rear cross-bolt. These several forms of the teeth are adapted for use in the smaller cultivators and are readily removable.

I claim—

1. The frame A, pivoted tongue D, standard *b*, the bifurcated hook plate *c* and segmental plate *d*, in combination with the sliding plate *e* and shaft *m*, the latter having a stud *n* and footpiece *k* as and for the purpose set forth.

2. The combination with the wheels, axle pivoted tongue, and main frame A, of the suspended harrow frame E, the W-shaped brace and connecting bars F F, and the pivotal connecting bars *r*, substantially as shown and for the purpose set forth.

3. The combination, with a frame, of a series of tooth-couplings secured thereto, each of which couplings is provided with two lugs which are connected by cross-pieces, a series of teeth, each of which is provided with a hollow head, placed on and detachably secured to the shank of the tooth, the said head being provided with projections adapted to connect with said cross-pieces, substantially as set forth and described.

4. The combination, with a frame, of a tooth coupling secured thereto, said coupling being provided with two lugs and cross-pieces connecting said lugs, a tooth provided with a hollow head, placed on the shank of said tooth and removably secured thereto, the said head being adapted to connect with said cross-pieces, and a pivoted dog, mounted between said lugs and adapted to lock the said tooth in place, substantially as set forth and described.

5. The combination, with a frame, of a tooth-coupling secured thereto, said coupling being

provided with two lugs connected by cross
pieces, a tooth provided with a removable hol-
low head, the said head being provided with
a hook 10 and a rear projection 9, and a piv-
5 oted dog 3, in position to be turned to bear
against said head, substantially as and for
the purposes described.

In testimony whereof I have affixed my sig-
nature in presence of two witnesses.

JOHN KILLEFER.

Witnesses:

W. A. MITCHEM,
R. F. GAHR.