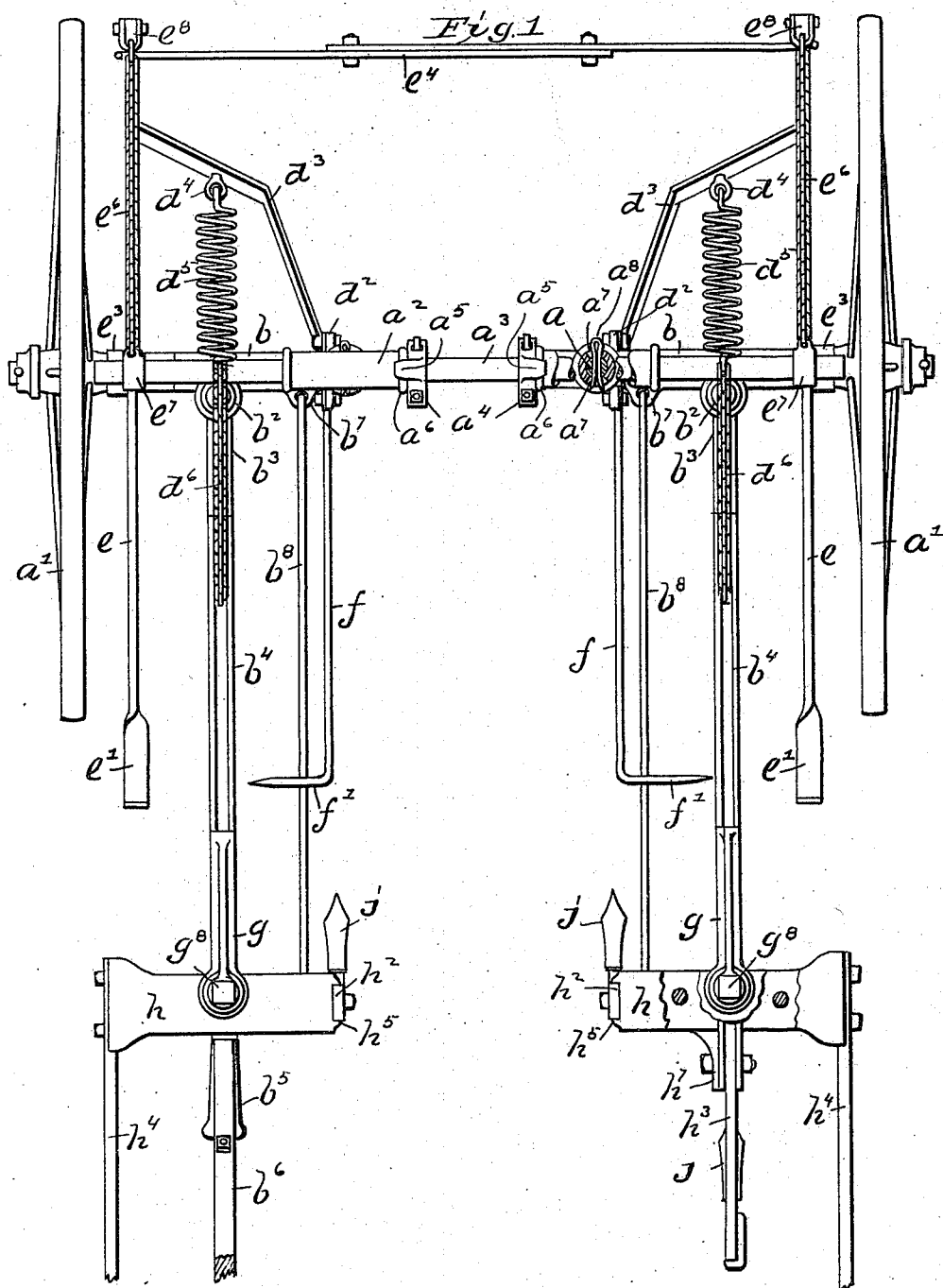


D. D. FUNK.
CULTIVATOR.

No. 570,281.

Patented Oct. 27, 1896.



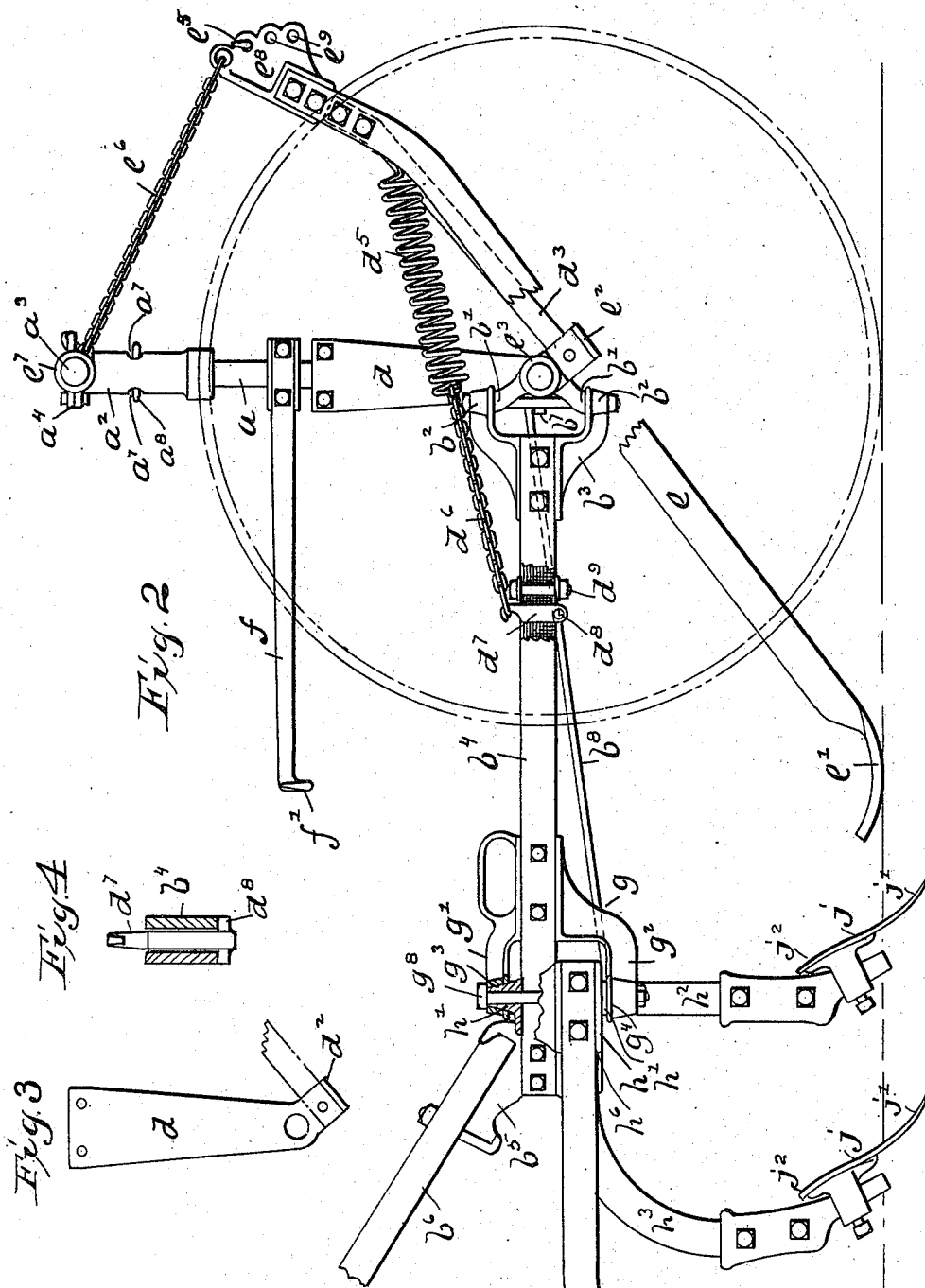
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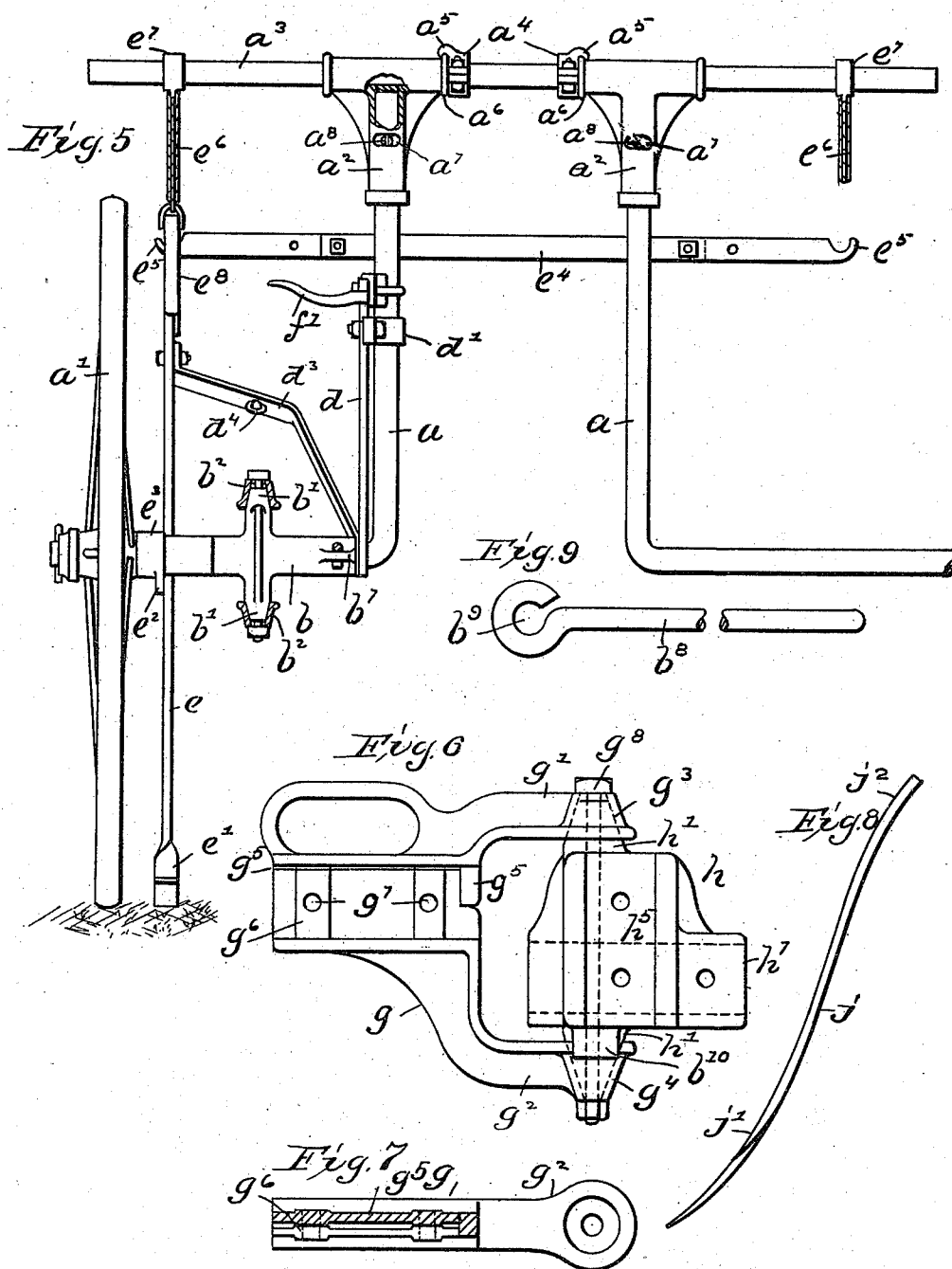
(No Model.)

3 Sheets—Sheet 3.

D. D. FUNK.
CULTIVATOR.

No. 570,281.

Patented Oct. 27, 1896.



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UNITED STATES PATENT OFFICE.

DANIEL D. FUNK, OF SPRINGFIELD, OHIO.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 570,281, dated October 27, 1896.

Application filed March 3, 1896. Serial No. 581,629. (No model.)

To all whom it may concern:

Be it known that I, DANIEL D. FUNK, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Cultivators, of which the following is a specification.

My invention relates to improvements in cultivators; and it has for its object the formation of a cultivator-frame which shall be capable of ready adjustments to different characters of soil, so as to operate easily and freely under all the varying conditions, and, further, to provide improvements in the construction of the device which renders it more easily operated, as well as in the more direct and perfect application of the draft to the cultivator-shovels. I attain these objects by the construction shown in the accompanying drawings, in which—

Figure 1 is a plan view of a cultivator embodying my invention. Fig. 2 is a side elevation of the same with the wheels removed and some of the parts broken away to more clearly illustrate the working parts. Figs. 3 and 4 are details of some of the devices shown in Fig. 2, hereinafter referred to. Fig. 5 is a partial rear elevation of the cultivator-frame. Figs. 6 and 7 are respectively a side and top view of the cross-head; Fig. 8, a detail of the cultivating-shovel, and Fig. 9 a detail of a connecting-link forming a part of the draft attachment to the cross-head.

Like parts are represented by similar letters of reference in the several views.

The main or forward part of the frame of my improved cultivator consists, essentially, of two L-shaped rods or frame-pieces a , the lower or horizontal part of which is adapted to form journals for the carrying-wheels a' , as well as supports for the cultivator-beams. Fitted on the top of the upright or vertical portion of these rods a are T-shaped bearings a^2 , the stem portions of which are adapted to fit over the ends of the vertical parts of the L-shaped rods or frame-pieces a and form bearings therefor. These T-shaped bearings a^2 are connected together by a rod a^3 , on which each of said bearings is journaled, this rod a^3 being in the normal position of the frame substantially parallel with the horizontal portions of the L-shaped rods

a . The T-shaped bearings a^2 are held in their positions on the rod a^3 by split or clamping collars a^4 , which are secured to said rod and are provided with hook-shaped projections a^5 , which engage over a flange or bead a^6 on said T-shaped bearings and hold the same against lateral movement on the rod a^3 , while at the same time they are permitted to turn on said rod. The bearings a^2 are also permitted a limited rotating movement on the bars a . To provide for this, the stem portions of the T-shaped bearings are each provided on opposite sides with slotted openings a^7 , and suitable keys or pins a^8 extend through said slotted openings and through the bars a , thus preventing end lateral movement of the bearings on said rods and at the same time permitting them to turn for a limited distance on said rods as trunnions.

There are sleeved on the horizontal portions of the bars a bearing-heads b . These bearing-heads have trunnions b' , which stand normally in a vertical position and on which there are journaled bearings b^2 , formed in the bifurcated end or end support b^3 of the cultivator-beam b^4 , this construction permitting either a vertical or horizontal movement of said beams.

At the inner ends of each of the bearing-supports b there is a vertical plate d , which is bifurcated at the bottom to fit over the horizontal part of the L-shaped rod a , and is clamped by a suitable collar d' or otherwise to the vertical stem of said L-shaped rod. This vertical plate d is provided at its lower end with a lug d^2 , to which there is secured a brace-rod d^3 , which extends forwardly and laterally and is connected at its outer end to a supporting runner-bar e . This runner-bar e is bent into or otherwise provided at its lower end with a shoe or runner e' , and is also secured by a lug or projection e^2 to a bearing-sleeve e^3 on the horizontal portion of the L-shaped rod a between the bearing-support b and the wheel a' . The respective runner-bars e , there being one on each side of the machine, are connected at their front ends by an adjustable bar e^4 , which is preferably formed with hook-shaped projections e^5 to engage in suitable eyes in the ends of said runner-bars to form a loose connection. The upper ends of said runner-bars are further

connected by means of chains or other suitable flexible connections e^6 to collars e^7 on the horizontal bar a^3 .

Clamped to the vertical portions of the L-shaped rods a there are backwardly-extending arms f , having hook-shaped projections f' , on which the cultivator-beams may be supported when not in use in the manner hereinafter more fully specified.

There is connected to each of the beams b^4 , which preferably consists of two parallel bars, a bifurcated bearing-head g , the forks g' and g^2 of which are provided near their extremities with tapered or concave bearings g^3 g^4 . This bifurcated head g is preferably made in two parts having overlapping and interengaging portions, as shown at g^5 and g^6 , each of the parts being provided with openings g^7 , which extend entirely through the same and through which the bolts pass which secure the said head to the parallel bars of the beam b^4 , and at the same time secure the two parts of said head together. Journaled in this bifurcated head is a cross-head h , which has at the top and bottom cone-shaped trunnions h' , which fit in the respective bearings g^3 and g^4 , a bolt g^8 being preferably passed through said parts. This cross-head h is open at the top, so that the parallel bars of the beam b^4 extend entirely through the same, so as to support a bearing-seat b^5 for the handle b^6 , the handle being thus connected directly and rigidly to the parallel bars or beams b^4 , while the cross-head h is pivoted to said beam. Connected to the cross-head h are the shovel-standards h^2 h^3 h^4 . The standard h^2 is fitted into a vertically-recessed opening h^5 at one end of the cross-head. The standard h^4 is fitted into a horizontal recess h^6 at the opposite end of the cross-head, while the standard h^3 is connected to a projecting lug h^7 on the rear of the cross-head, the parts being thus firmly and rigidly connected to said cross-head.

Extending from an eye or lug b^7 on the bearing-support b there is a parallel rod b^8 , the opposite end of which is formed with an open eye b^9 , which fits over a boss b^{10} on the bottom of the cross-head. This parallel rod, together with the parallel bars, maintains the cross-head in a plane at right angles to the line of draft in a well-known manner. Instead of having the parallel rod b^8 in the same horizontal plane with the bars b^4 , however, I extend this bar at an angle thereto and connect the rear end at the bottom of the cross-head so that a brace is formed from the bearing-support b to the cross-head, thus relieving the trunnions of said cross-head from much of the strain which comes thereon in operation. The brace connections d^3 , which have been heretofore referred to, are each provided immediately in front of the pivoted connection of the beams b^4 with an eye or lug d^4 , and to this lug or eye there is connected one end of a spring d^5 , which is connected by means of a suitable chain or other flexible connection d^6 to a movable hook d^7 , located

between the bars of the beam b^4 . This hook d^7 is preferably provided at the bottom with a cross-pin d^8 , which receives the upward pull of the spring, and adjacent to the hook there is a bolt d^9 , which extends through the bars and is adapted to be clamped to the edges thereof to form a stop for said hook, thus furnishing means by which the tension of the spring can readily be adjusted as well as the point of attachment between said spring and the beam. This spring, as before stated, is connected at its front end in a direct line with the pivotal point of the beam, so that when the beam is in a line parallel with the draft the points of attachment of the spring and the pivotal point of the beam are in a straight line. The point of attachment for the forward end of the spring is above the beam, so that the spring has a tendency to lift the beam and at the same time regulate the depth of penetration of the shovels in the earth. If the shovels are lowered to a considerable extent the spring or its flexible connection contacts with the pivoted connection at the front end of the beam and thus increases the raising pull of said spring. At the same time if the beam is deflected laterally in either direction the spring will assist the deflection as soon as the parts have passed the centers.

Each of the standards h^2 h^3 h^4 is provided in the usual way with shovels j . These shovels are made of a peculiar form, being each constructed with a reverse or ogee curve, the lower part j' being curved forwardly, while the upper part j^2 is curved rearwardly, so that the soil which is cultivated thereby will pass upwardly, and having reached the center of the shovel will be more readily discharged by passing backwardly over the top of the shovel, so that the sticking of the soil to the shovels will be largely prevented.

The runner-bars e are provided at the top with heads e^8 , having a series of openings e^9 , to which the motive power is to be attached, the cultivator described being of the tongueless form, though it is obvious that some of the devices herein described are equally applicable to cultivators having tongues.

The arrangement of the frame described permits the beams of the cultivator to be readily adjusted to any work to be performed. It permits one wheel to run in advance of the other, the frame readily adjusting itself thereto, while by the arrangement of the cross-bars a^3 and e^4 and the loose or journaled parts which connect them to the frame-posts a the wheels are maintained at all times parallel one with the other, though one may be in advance of the other.

Having thus described my invention, I claim—

1. In a cultivator-frame, the L-shaped rods having their vertical stems journaled in vertical bearings on a connecting-bar, said L-shaped rods forming journals for the carrying-wheels, and a separate rod or bar form-

ing a parallel connection between the horizontal portions of said frame-pieces, substantially as specified.

2. In a cultivator, carrying-wheels, frame-pieces having trunnions for said carrying-wheels, and suitable parts or stems connected to said trunnions, bearing-supports for said stems, and a cross-bar connecting said bearing-supports, said bearing-supports being journaled on said cross-bar as well as on said vertical stems, and a separate bar or connection between said frame-pieces and parallel with said connecting cross-bar, substantially as specified.

3. In a cultivator having carrying-wheels, the L-shaped frame-pieces journaled thereon, T-shaped bearing-supports journaled on said frame-pieces, and a connecting-bar journaled in said T-shaped bearing-supports, runner-bars supported on sleeves or trunnions on said frame-pieces, and a connection from said connecting-bar to said runner-bars, substantially as specified.

4. A cultivator-frame consisting of a transverse bar, and L-shaped rods journaled thereon by bearing-supports in which said L-shaped bars are also journaled, runner-bars connected by flexible connections to said transverse bar, and a parallel connecting-bar between said runner-bars, and a connection from said runner-bars to the horizontal portions of said L-shaped rods, substantially as specified.

5. The combination with the transverse bar and the T-shaped bearings thereon, of the L-shaped rod having a limited movement in said bearings, runner-supports having bearings on said L-shaped rods, and a connection between said runner-supports parallel with the transverse bar, substantially as specified.

6. The combination with a bearing-support and a beam pivoted thereto, a cross-head pivoted in said beam, and a parallel rod extending from said bearing-support to said cross-head, said rod being extended at an angle to the beam and connected at one end substantially opposite the horizontal axis of said beam and at the other to the bottom of the cross-head so as to form a draft connection therefor, substantially as specified.

7. In a cultivator, a cultivator-shovel, substantially as described, which has a plain front surface formed with a double or ogee curve, substantially as and for the purpose specified.

8. In a cultivator, a frame, pivoted beams extending rearwardly from the frame, of a forwardly-extending support in front of and in line with the pivoted connection of each of said beams, a spring extending from the support to the beam at a point behind the pivotal connection, and a movable device for connecting said spring to said beam and in line with the pivoted support therefor, substantially as specified.

9. The combination with a beam, a bifurcated support on the beam having concave or tapered bearings, and a cross-head having cone-shaped trunnions to fit in said bearings, the bifurcated support being formed of two parts with overlapping and interlocking portions, and means for securing the fastening device which secures said support to the beam and the overlapping portions of said support, substantially as specified.

In testimony whereof I have hereunto set my hand this 24th day of February, A. D. 1896.

DANIEL D. FUNK.

Witnesses:

OLIVER H. MILLER,
CHAS. I. WELCH.