

No. 641,559.

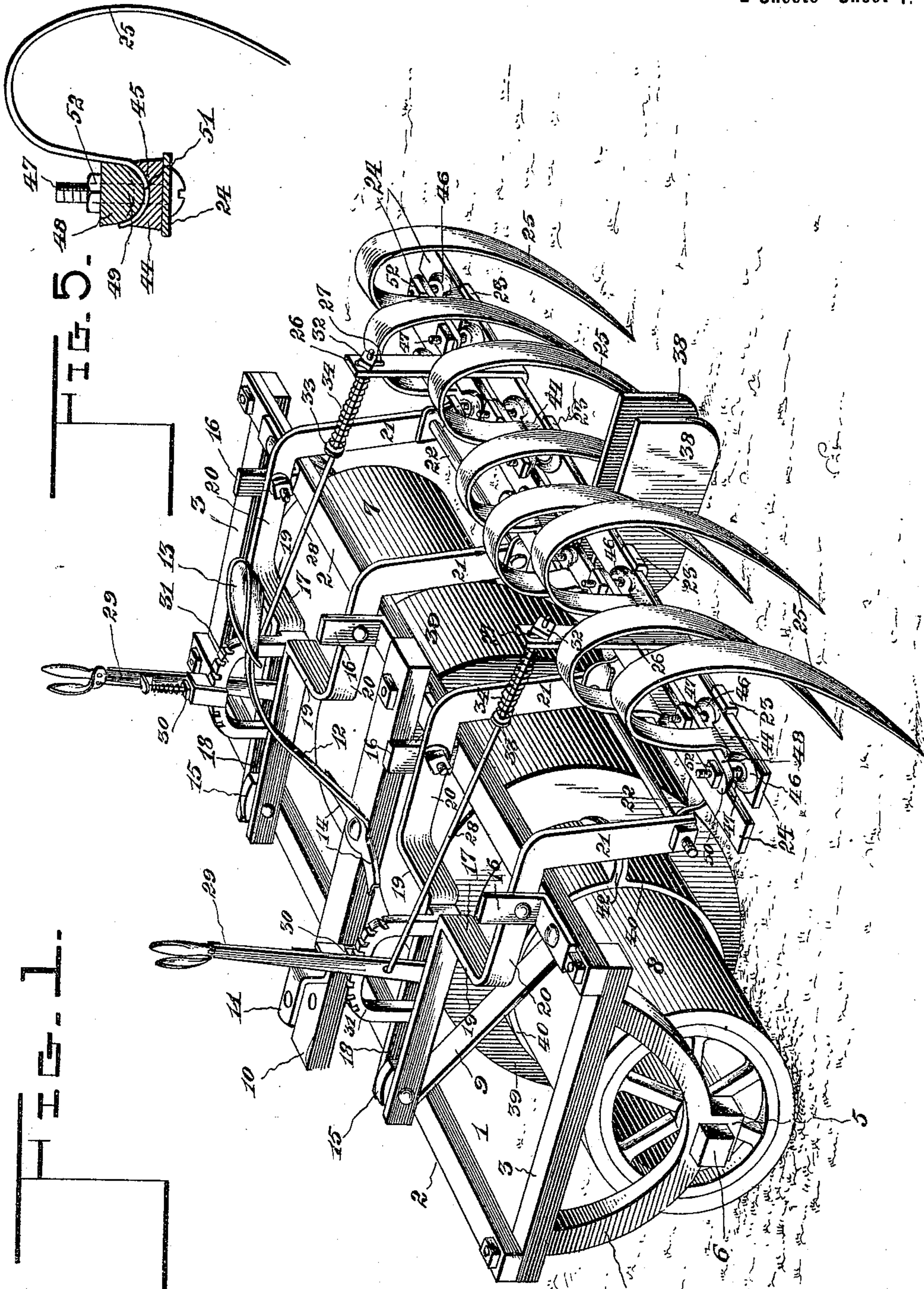
Patented Jan. 16, 1900.

C. L. M. ST. CLAIR.
CULTIVATOR.

(Application filed July 6, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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Inventor

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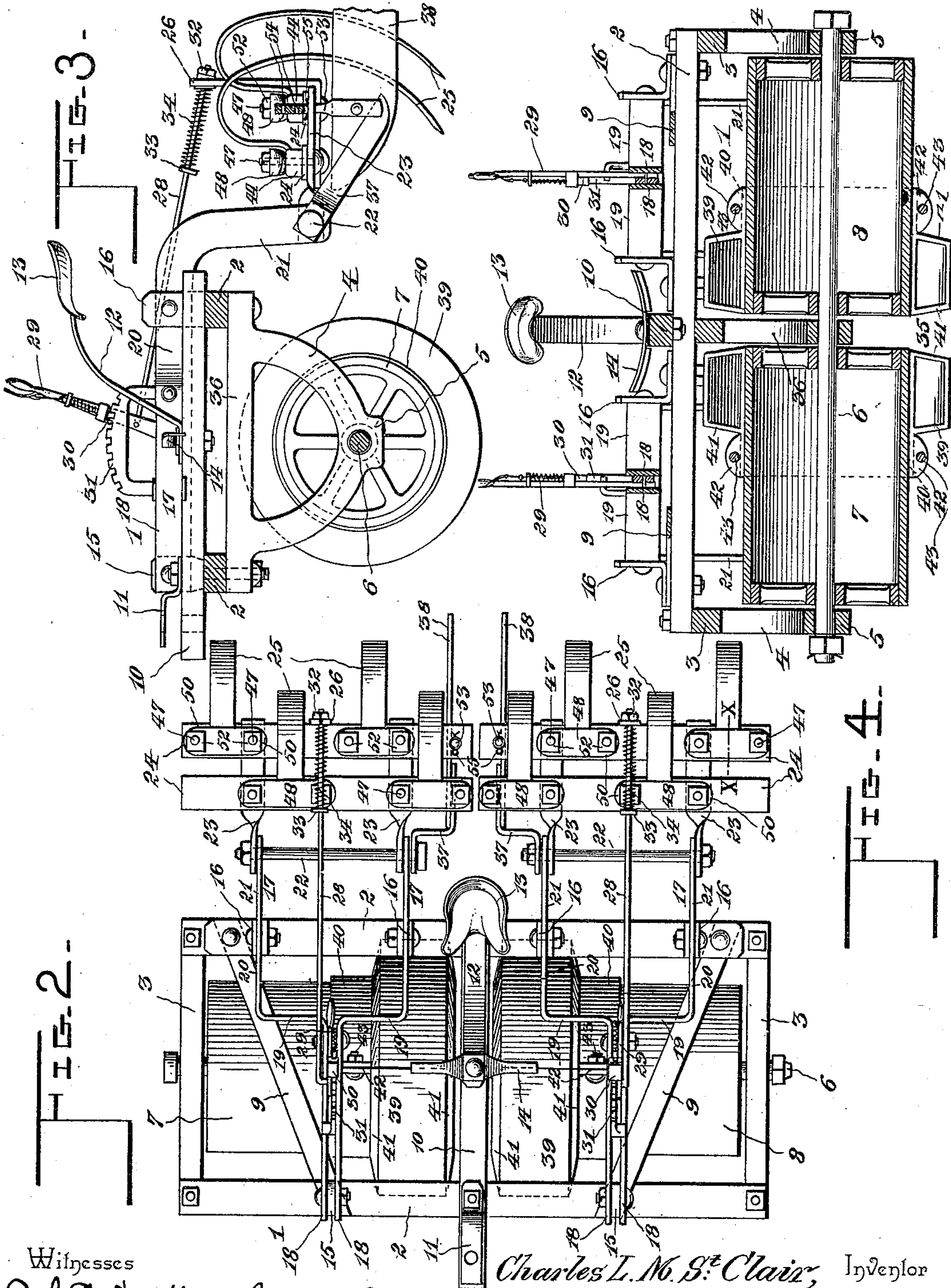
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UNITED STATES PATENT OFFICE.

CHARLES L. M. ST. CLAIR, OF BLUE SPRINGS, MISSOURI.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 641,559, dated January 16, 1900.

Application filed July 6, 1899. Serial No. 722,955. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. M. ST. CLAIR, a citizen of the United States, residing at Blue Springs, in the county of Jackson and State of Missouri, have invented a new and useful Cultivator, of which the following is a specification.

This invention relates to cultivators; and the object of the same is to provide a combined device of this character having removable attachments which are capable of being replaced in part by other devices, but having a primary arrangement to render the machine particularly efficient in cultivating listed corn and also adapted for general work that can be accomplished in a satisfactory manner with a very slight change, and all the parts are easily manipulated and under the control of an operator to regulate the various adjustable features and cause a conformation to inequalities of the ground-surface.

The invention consists, primarily, of a frame supporting land-rollers and adjustable gangs of yielding cultivator or spring-harrow teeth which are self-adjustable to compensate for irregularities in the ground-surface, the rollers being supplied with removable ditching attachments, combined with adjusting mechanisms, as well as special structural features hereinafter more particularly referred to.

The invention further consists of the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a cultivator embodying the invention. Fig. 2 is a top plan view of the same. Fig. 3 is a central longitudinal vertical section. Fig. 4 is a transverse vertical section through the rollers. Fig. 5 is a section on the line *x x*, Fig. 2.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates the main frame, which is composed of main cross-bars 2, connected by end bars 3. The end bars 3 have formed therewith or attached thereto depending curved hangers 4, with central enlargements 5 to provide opposite journals for a transversely-extending shaft 6, which is continuous from one end of the machine to the

other in a transverse direction, and loosely mounted thereon are rollers 7 and 8. The frame 1 is braced at different points on the opposite sides of its center by obliquely or diagonally disposed strap-braces 9, and the cross-bars 2 are connected at the center by a draft-bar 10, having a suitable clip 11 for the attachment of a doubletree or analogous device or a tongue, as may be desired. The draft-bar 10 has the lower end of a yielding or spring support 12 also attached thereto and connected at its upper portion or end to a driver's or operator's seat 13, the lower portion of the said support also having attached thereto or formed as a part thereof laterally-projecting foot-rests 14. The front cross-bar 2 has short posts 15 rising therefrom, one on each side of the draft-bar, and on the rear cross-bar 2 angle-plates 16 are arranged in pairs on opposite sides of said draft-bar.

Supplemental frames are held by the main frame, and each is composed of a pair of flat metal bars 17, having their front ends or terminals drawn closely toward each other, as at 18, and bolted or otherwise fastened to the post 15, the same attachment being carried out in connection with each frame. The said front ends or terminals of the supplemental frames are parallel and extend rearwardly over a greater part of the distance between the front and rear cross-bars 2 and have rear laterally-projecting extensions 19, which are again bent to form continuations 20 in planes parallel with the front ends or terminals 18. These continuations 20 are removably bolted or otherwise fastened to the vertical members of the pairs of angle-plates 16 and extend rearwardly from the latter a short distance over the rear cross-bar 2 and terminate at the rear in downwardly-extending rearwardly-inclined legs 21. Each pair of the legs 21 has a bearing-rod 22, removably supported therein, and extending from said bearing-rod are connecting straps or arms 23, to which are fastened pairs of head-bars 24, arranged in planes parallel with the cross-bars 2 of the main frame and also with the rollers 7 and 8. The head-bars 24 have yielding cultivator or spring-harrow teeth 25 connected thereto in alternation on the separate bars 24. By this means a portion of the cultivator or harrow teeth are in advance of others or the teeth

connected to the forward head-bar 24 have their pointed or working ends closer to the rollers 7 and 8 than the teeth that are attached to the rear head-bar, and, as indicated, 5 an alternation is thus set up and the teeth made to efficiently cover a greater surface in their work. The connecting straps or arms 23 have bolt-openings therethrough at regular intervals, which aline with similar openings in the bars resting thereon, as will be 10 readily understood, and the said bars are thus held at predetermined distances apart in each pair of the same, it being preferred, of course, to preserve a similarity in the adjustment or 15 position of the opposite gangs of teeth.

Connected to each pair of bars 24, about centrally thereof, is a vertical adjusting-arm 26, having a slot 27 in the upper terminal thereof, in which is movably held the rear end 20 of a connecting-rod 28, which projects forwardly and is attached to a shifting lever 29, pivotally mounted between the front ends or terminals 18 of the supplemental frame 17. The said shifting lever is provided with a 25 suitable dog 30, which is spring-actuated and operates relatively to a toothed segment 31 adjacent the said lever and also held or supported by the said front ends or terminals 18. The connecting-rod 28 has its rear end screw- 30 threaded to receive a fastening-nut 32, to thus provide means for quickly attaching or disconnecting the said rod 28 to and from the arm 26, and between the front of the latter arm and a stop 33 on the said rod 28 a coiled 35 spring 34 surrounds the rod and provides means for establishing a yielding or cushioned bearing of the arm 26 on the said rod 28. The connecting straps or arms 23 have 40 movement on the bearing-rod 22 of each frame, and when the shifting lever 29 at either side or both sides, as the case may be, have imparted thereto a forward movement the bars 24 are elevated and the teeth 25 raised to inactive position. A reverse movement of 45 either one or both of the said levers 29 will lower the teeth 25, and the latter, in addition to their own resiliency or yielding nature, will be permitted to conform to inequalities of the ground-surface through the medium of the loose connection of the upper 50 end of the arm 26 with the rod 28.

Both gangs of teeth are similarly supported and have adjustable features in all respects alike, and at times it may be desirable to 55 have one gang inactive while the other is at work. The gangs of teeth are directly in rear of the opposite rollers 7 and 8, and between the inner ends of the latter a space 35 is formed, the shaft 6 being at this point rotatably held in the lower portion of an intermediate hanger 36, also secured to the cross-bars 2. The inner opposing ends of the 60 head-bars 24 of the gangs of cultivator or harrow teeth 25 are closely arranged, but far enough apart to not interfere, as no lateral movement is permitted, and to the inner end of the bearing-rods 22 the front ends of an-

gular arms 37 are movably connected and have their rear ends pivotally attached to vertically-disposed plates or followers 38, which 70 are spaced apart a distance about equal to that between the inner rollers 7 and 8 or possibly a little greater in order to effectively carry out their function.

On the inner portions of the rollers 7 and 8 75 ditching attachments are applied, and consist of hollow sleeves 39, having clamping-collars 40 attached to their outer edges or ends. The said sleeves 39 are of less width at their outer portions than at their inner 80 bearing sides, and the opposite ends 41 are inclined inwardly from the said inner sides. Each of the sleeves is made in two sections of corresponding or exact dimensions, and the 85 collars 40 are similarly divided and at their terminations are provided with outstanding ears 42, the said ears of the opposite sections of each attachment being brought closely together when applied to removably receive 90 clamping-bolts 43. The ears 42 of the collars 40 are far enough inward from the outer working surface of each of the sleeves to prevent interference with the depression of the sleeves into the soil. The sleeves are shown applied 95 to the inner contiguous ends of the rollers 7 and 8 and in this position will form ditches on opposite sides of a ridge or hill in which the corn or other material may be planted, and the followers 38, coming in behind, will 100 take up the loose soil that may still be left after the sleeves have completed their work and throw it against opposite sides of the ridge or hill. The opposite sloping sides of the sleeves also have a beneficial effect on the 105 ridge or hill, and the plants will be uninjured by passing between the inner ends of the rollers 7 and 8 or through the space 35 as the machine travels over the surface or tract operated upon. The formation of the ditches 100 by the attachment thus applied can also be obtained at greater distances apart, and it might be desirable at times to use the rollers alone without the well-understood advantages of combining the gangs of teeth 25 there- 115 with. To obtain a greater space between the ditches, the sleeves 39 may be shifted on the rollers from the position shown toward the outer ends of the latter. It may be found convenient at times to use sleeves having a greater radial extent to vary the depth of the 120 ditches, and for this purpose the said sleeves can be furnished with each machine in sets of different outward projection.

When it is desired to use the rollers 7 and 8 independently of the ditching attachment, 125 the sleeves 39 can be disconnected and removed without displacing the rollers from their shaft 6, and that part of each roller not occupied by the sleeve will serve efficiently to crush lumps or clods on the ground-sur- 130 face over which the said rollers move and simultaneously with the formation of the ditches by the said sleeves. During the operation of the rollers with or without the ditch-

ing attachments the yielding cultivator or harrow teeth 25 will subsequently act to loosen up the soil and make it better to receive the seed, or in cultivating planted crops said teeth will prepare the soil for the reception of moisture by breaking the surface crust or hardened top layer, and thereby assist materially in the propagation or growth of the plants. In running close to a fence and after an outer portion of a tract of land has been treated by the teeth of the opposite gangs the outermost gang, or that farthest from the fence, can be elevated and rendered inactive, and thus reduce the draft strain. Either one of the gangs can be cleared from the surface also in passing over a partial obstruction. The teeth 25 can also be replaced, if desired, by other cultivating devices; but it is preferred that they be used with the rollers in view of the effectiveness of the combination. To detachably and firmly hold each of the teeth in connection with its head-bar, a preferred form of chair-fastening is used and clearly shown by Figs. 1 and 5. Each chair comprises a lower socket member 44, having a concaved seat or socket 45 in the upper central portion, which extends in a transverse direction, the opposite ends of said member being provided with ears 46, with apertures therethrough for the passage of combined fastenings and clamping-bolts 47. To the lower member 44 an upper member 48 is applied and formed with a convex central projection 49, which fits into the concaved seat or socket 45, and also provided with end extensions 50, which are apertured for the passage therethrough of the combined securing and clamping bolts 47. Each tooth 25 is intermediately bowed or arched, as will be readily understood, and the front terminal 51 is curved to fit in the concaved seat 45 of the member 44 of the fastening-chair. After said terminal is so positioned in the member 44 of the chair the member 48 is applied thereover and held with firm pressure thereon by running nuts 52 on the upper screw-threaded ends of the said combined securing and clamping bolts 47. By this means the teeth are made fast to the bars 24 without the use of securing devices extending directly therethrough; and also loosening or disconnection of the teeth, due to a rearward drag thereon, will be prevented, owing to the fact that the front curved terminal 51 of each tooth will be immovably clamped between the members 44 and 48. Fracture is less liable to occur in the several teeth by the form of connection set forth in view of the regular curve of the terminal 51 in each instance, and in applying the teeth to the head-bars 24 they can be correctly set at one operation without the necessity of after readjustment and before tightening up the fastening devices. The followers 38 also have a free vertical movement by reason of the arms 37 carrying the same being pivotally attached to the inner ends of the bear-

ing-rods 22, and rising from the said followers are guide-pins 53, which extend upwardly through adjacent portions of the rearmost head-bars 24. The depression of the said followers is regulable by the formation of transverse openings 54 through the upper parts of the pins 53 for the reception of cotter-pins or analogous devices 55, that bear against the upper surfaces of the said rearmost head-bars 24. The weight of the said followers is sufficient to hold them down under normal conditions, and the elevation thereof will depend upon the position of the cotter-pins 55 in the guide-pins 53.

When it is desired to use the rollers 7 and 8 alone, the frames 17 can be easily disconnected from the posts 15 and vertical members of the angle-plates 16, and by having the adjusting devices carried by the said supplemental frames the removal of the latter will entirely clear the main frame 1 without requiring a detachment of such adjusting devices separately. When the said supplemental frames are removed, the rollers and ditching attachments can be used for ditching alone or the sleeves 39 can be removed from the rollers 7 and 8 and the latter employed exclusively for treating soil or other surfaces that require a rolling operation solely.

The preferred form of the improved cultivator, together with the several attachments specified, has been illustrated and descriptively disclosed; but it is obviously apparent that various applications may demand a change in the proportions, size, and minor details, and such changes will be made as reside within the scope of the invention and do not detract from the advantages.

Having thus described the invention, what is claimed as new is—

1. In a device of the character set forth, the combination with rollers, of sleeves mounted thereon and having clamping-collars to bind against said rollers.

2. In a device of the character set forth, the combination with rollers, of sectional sleeves removably mounted thereon and provided with sectional collars adapted to be clamped around the rollers.

3. In a device of the character set forth, the combination of a main frame, a roller carried by said frame, a supplemental frame removably supported by the main frame, a gang of teeth connected to the supplemental frame and having an arm extending upwardly therefrom, with a slot therein, adjusting devices attached to the said supplemental frame, and a connecting-rod between the said adjusting devices and arm, said connecting-rod having a yielding movement in the arm.

4. In a device of the character set forth, the combination of a main frame, a roller journaled therein, a supplemental frame removably attached to the main frame and having rear depending portions, a bearing-rod mounted in the terminals of said depending por-

tions, teeth movably connected to said bearing-rod, and means for adjusting the teeth.

5 In a device of the character set forth, the combination of a main frame adapted to be propelled by suitable means, a supplemental frame removably attached thereto, a gang of teeth pivotally connected to rear parts of said supplemental frame, adjusting devices carried by the supplemental frame, and a yielding connection between the said adjusting devices and the gang of teeth.

10 6. In a device of the character set forth, the combination of a main frame adapted to be supported by movable devices, a supplemental frame removably supported by the said main frame and having a bearing-rod in rear depending portions thereof, head-bars arranged parallel and movably connected to the bearing-rod, teeth arranged in alternation in connection with the head-bars, adjusting devices at the front of said supplemental frame, and a yielding connection between said adjusting devices and the head-bars.

15 7. In a device of the character set forth, the combination of a main frame, rollers supported thereby and having a space between their inner ends, a pair of followers movably positioned in rear of the rollers and in line

with the space between the inner ends of the same, guide-pins on the followers freely movable upwardly through adjacent parts, and adjustable devices in the said guide-pins for regulating the depression of the said followers.

8. In a device of the character set forth, the combination of a main frame, rollers carried thereby, opposite supplemental frames removably supported on the said main frame, independent gangs of teeth movably attached to the rear portions of the said supplemental frames, adjusting devices held by the front portions of said supplemental frames, and yielding connections between the said adjusting devices and the gangs of teeth, whereby the latter are permitted to have a self-adjustment to conform to irregularities of the ground-surface and also positively adjustable to elevate or depress the said gangs of teeth relatively to the ground-surface over which the device travels.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES L. M. ST. CLAIR.

Witnesses:

J. ELMER BURRUS,
OLNEY BURRUS.