No. 835,929. PATENTED NOV. 13, 1906.

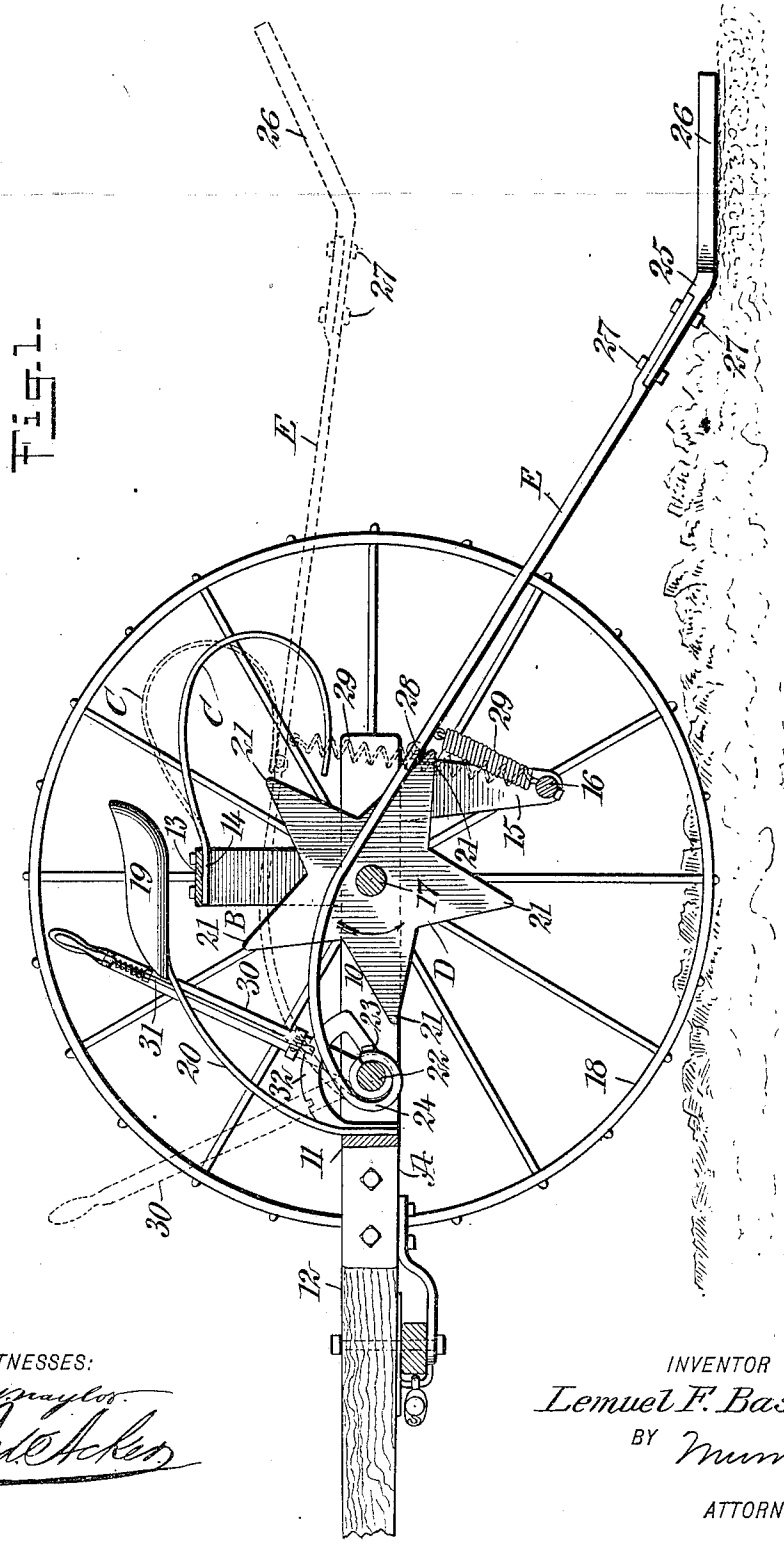
L. F. BASSETT.

MACHINE FOR WORKING THE SOIL.

APPLICATION FILED MAR. 3, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



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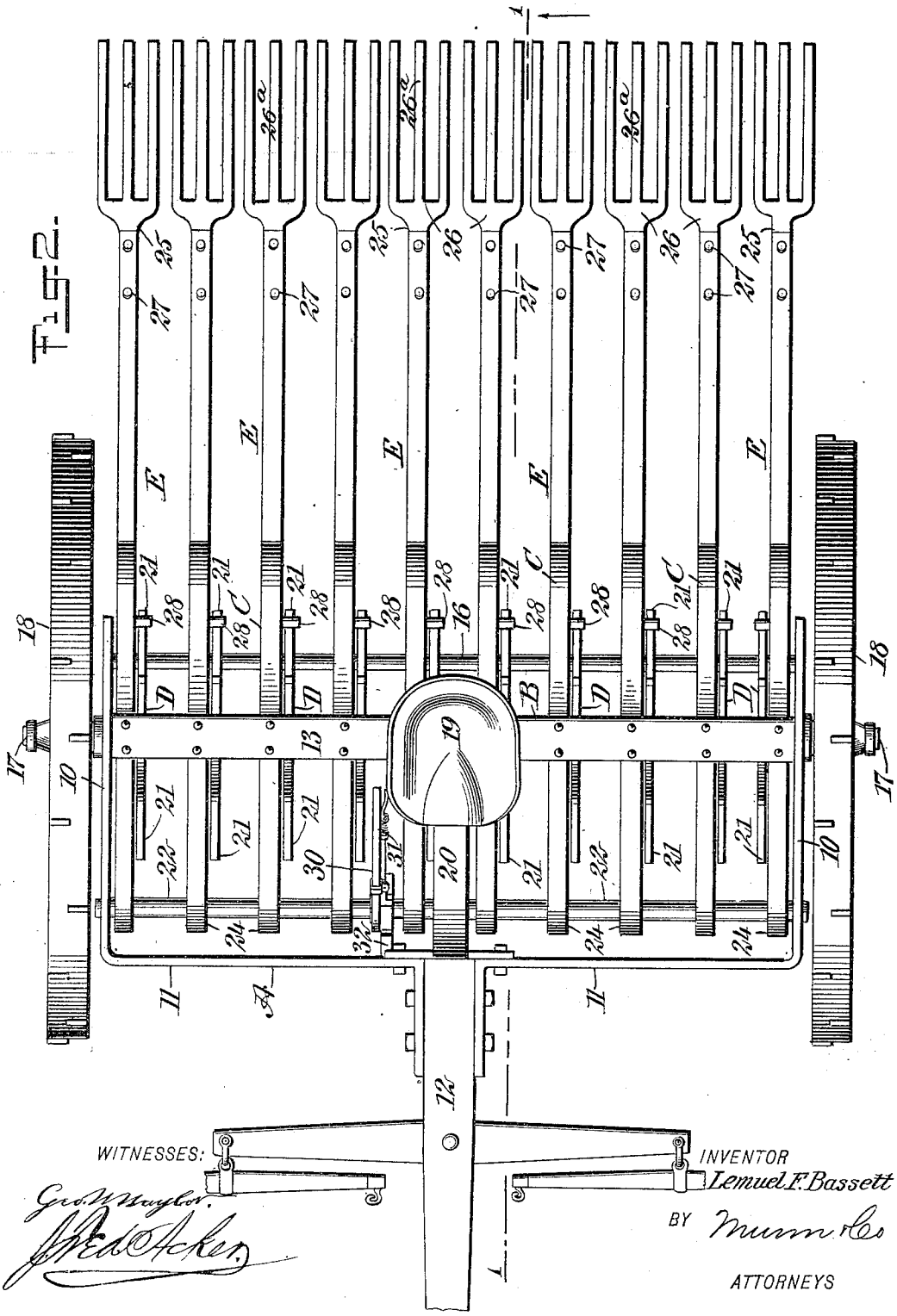
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

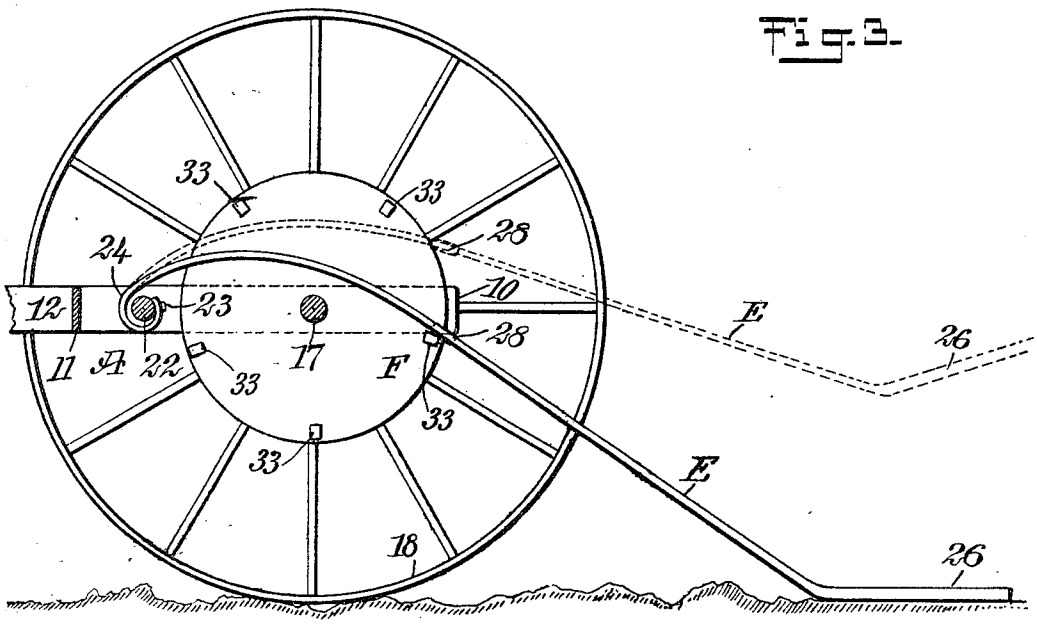
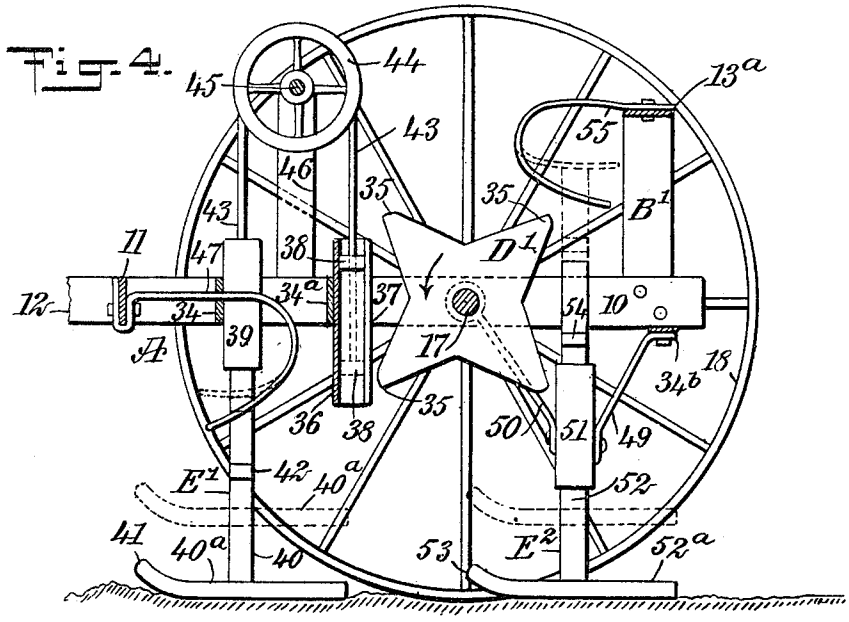


Fig. 4.



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UNITED STATES PATENT OFFICE.

LEMUEL FRANKLIN BASSETT, OF REDDING, CALIFORNIA.

MACHINE FOR WORKING THE SOIL.

No. 835,929. Specification of Letters Patent Patented Nov. 13, 1906.

Application filed March 3, 1906. Serial No. 304,014.

To all whom it may concern:

Be it known that I, LEMUEL FRANKLIN BASSETT, a citizen of the United States, and a resident of Redding, in the county of Shasta and State of California, have invented a new and Improved Machine for Working the Soil, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a machine adapted to be drawn over a field and operated automatically to break lumps upon lumpy cloddy lands or where more than the usual fineness of soil is desired after it has been plowed and perhaps partially harrowed down.

A further purpose of the invention is to provide a machine of the character mentioned which will be light, simple, durable and economic, and so constructed that a series of striking-arms will be automatically operated to whip or beat, cut, or dig the soil, said arms being provided at their free ends with such tools as are best adapted for the purpose, and to provide means for accentuating the whipping action of said arms when more force than gravity is desired.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal section through the device, taken practically on the line 1 1 of Fig. 2. Fig. 2 is a plan view of the machine. Fig. 3 is a vertical section through the rear portion of the machine, showing the application of a slightly-different trip device for the striking-arms; and Fig. 4 is a vertical longitudinal section through a machine in which still other means are shown for operating the striking-arms.

A represents the frame of the machine, which in the drawings consists of parallel side members 10 and front members 11, the latter being connected to a tongue or pole 12. An arch-frame B extends from one side member 10 of the frame A to the other and upward from said frame members, the top member 13 of the arch-frame being flat, and to the under side of the upper member 13 of the arch-frame the forward ends 14 of a series of springs C are secured. These springs are practically loop-springs and extend rearwardly with more or less of an upward curvature from the said arch-frame B. Then the said springs are curved downward and are carried forward a certain distance with an upward inclination at their lower or free ends, as is clearly shown in Fig. 1.

In the further construction of the frame brackets 15 extend downward from the rear end portions of the side members 10 of the main frame, and the ends of a bar 16 are secured in said brackets. An axle 17 is mounted to turn loosely in the frame A, being located below the arch-frame B, as is shown in Fig. 1, and traction-wheels 18 are secured to the ends of the said axle. The driver's seat 19 is shown located over the arch-frame B and is attached to the front of the main frame A by a spring-shank 20.

A series of star-wheels D is secured upon the axle 17 in any improved manner, operating in direction of the arrow shown in Fig. 1, and while the points 21 of these wheels are shown as five in number their number may be increased or decreased without departing from the spirit of the invention. The star-wheels are so placed as to be each just at one side of one of the springs C.

In connection with each star-wheel D a striking-arm E is employed. These arms E are each of the same construction and are attached at their forward ends to a shaft 22, mounted to turn in the sides of the main frame A adjacent to the front of said frame. The forward or front ends of the striking-arms E are partially coiled around the shaft and are attached to the said shaft by bolts 23 or their equivalents. The coiled ends of the said arms, which are designated as 24, are of spring-steel, or of other spring metal, and the arms E are arched upwardly and raerwardly from the shaft 22 over the axle 17, clearing the latter, and the rear portions of the arms E extend to the ground with a downward inclination, as is shown in Fig. 1.

The shank 25 of a foot 26 is removably attached to the lower end of each striking-arm E by means of bolts 27 or their equivalents. The foot-sections 26 are in the nature of beaters or cutters and are adapted to lie flat on the ground and in the operation of the arms E to beat or practically whip or cut the ground, so as to break all clods that may be beneath them. These beating-tools 26 may be of any form best adapted for the work in hand; but the tool shown in the drawings—that is, having its body provided with a se-

ries of parallel tines 26ª—is one which has been found very successful in action.

The body portion of each of the striking-arms E is provided with a pin 28, and these pins are so placed that as the star-wheels D revolve the points of the said star-wheels will engage the said pins or projections 28 one after the other and will first raise the arms with which they engage and then release the said arms. If no springs are employed, the arms simply drop by gravity, being accelerated in such action by the weight of the beaters 26; but one or more springs may be employed in connection with each of the striking-arms E, if deemed best. As shown in the drawings, as the striking-arm is raised it engages with the free end of an upper spring C and places the said spring under tension, as is shown by dotted lines in Fig. 1. Therefore when the arms are released after having been elevated the springs C, acting in conjunction with the coils 24, also placed under tension when the arms are raised, gradually accelerate the downward movement of the arms and cause the beaters 26 to violently strike the ground, and yet the spring-coils 24 will permit the beaters to slightly rebound, so as to obtain a whipping action on the soil.

In addition to the springs C other springs 29 may be employed for each of the striking-arms. Said springs, as is shown in Fig. 1, are preferably coil-springs, one end of a spring being secured to the under face of an arm E and the other end to the rod 16, carried by the brackets 15 of the frame. When it is desired to raise all of the arms E and hold them in elevated position so as to turn corners or in carrying the machine to and from the field, the shaft 22 is rocked through the medium of an attached lever 30, provided with a thumb-latch 31, which thumb-latch engages with a rack 32, suitably secured to the forward portion of the frame A.

In Fig. 3 I have illustrated the employment of the striking-arm E without the attached springs shown in Fig. 1, relying simply upon the spring-section 24 of the arms for a quick return, and instead of the star-wheels D, I have employed a series of disks F, secured to the axle 17. These disks F are provided with series of projections 33 upon one of their faces, and as the said disks revolve the projections strike the arms E one after the other, lift the arms to the dotted position shown in Fig. 3, and then release the arms, whereupon the beaters are brought into violent contact with the ground.

In the construction shown in Fig. 4 I have departed from the use of the rearwardly-extending striking-arms E and have employed instead vertical striking-arms in two series—a forward series E′ and a rear series E². The frame of the machine is the same as has been heretofore described, with the exception that the said frame is provided near the front with a cross-bar 34, and between the cross-bar 34 and the axle another cross-bar 34ª is provided for the frame, while a third cross-bar 34ᵇ is secured to the rear portion of the frame at its lower edge. The frame is also provided at its rear portion with an upwardly-extending arched auxiliary frame B′, the upper member 13ª whereof is flat.

Instead of the five-pointed star-wheel D (shown in Fig. 1) I have under this construction employed a series of star-wheels D′, securely mounted on the axle 17, the said star-wheels D′ having four points 35 at equal distances apart, and said star-wheels D′ turn in the same direction as do the star-wheels D, as is indicated by the arrow in Fig. 4.

A series of cylinders 36 is secured to the rear face of the intermediate cross-bar 34ª. These cylinders extend both above and below the frame A and face the star-wheels D′, one of the said cylinders being directly opposite each of the said star-wheels, and each of the cylinders 36 is provided with a vertical slot 37 in its rear face, extending through from top to bottom, and the points 35 of the star-wheels D′ enter the slots 37 in said cylinders 36 as the star-wheels are revolved and engage with pistons 38, held to slide in the said cylinders, and at such engagement the pistons 38 are carried down in the said cylinders.

A series of guides 39, preferably in the shape of rectangular boxes, are secured to the inner face of the forward intermediate cross-bar 34, one of these guides 39 being opposite each cylinder 36. These guides receive the shanks 40 of the vertical striking-arms E′ of the forward series, the said shanks 40 being rectangular in cross-section, and these shanks slide freely in the guide-boxes 39. Each shank 40 is attached at its lower end to a beater 40ª, adapted for engagement with the ground, the connection between the shanks and the beaters of the said arms E′ being at a point between the ends of the beaters, and the forward ends 41 of the beaters 40ª are upturned, so that as the machine passes over the ground the forward ends of the beaters will not dig into the ground.

The shank 40 of each vertical striking-arm E′ is provided with an offset 42 upon one side at a point below the guide-box 39 for the arm, and a band or cable 43 is secured to the upper end of the shank 40 of each vertical striking-arm E′, and these bands or cables are passed each over a peripherally-grooved pulley 44, all of which pulleys are loosely mounted upon a shaft 45, secured to uprights 46, attached to the side members 10 of the frame, and the opposite end of each band or cable is secured to a piston 38, operating in a cylinder 36.

Springs 47 are secured to the forward portion of the frame A, and the said springs are in the form of hooks, being carried rearward

and then curved downward and forward, the free ends of the said springs being in engagement with the sides of the shanks 40 of the vertical striking-arms E′ at a point above the lugs or offsets 42 thereon, so that when a wheel D′ revolves and a point of the wheel enters a cylinder 36 and carries down the piston 38 in that cylinder to raise the striking-arm operated by said piston the offset 42 of the striking-arm operated is brought into engagement with the free end of the companion spring 47, and the said spring is placed under tension, as is shown by dotted lines in Fig. 4, whereby when the point of the wheel has cleared the piston 38 the spring will immediately act to force the elevated striking-arm downward to bring the beater 40^a in violent engagement with the ground.

With reference to the rear series of vertical striking-arms E^2 a series of guide-boxes 51 is provided, corresponding to the guide-boxes 39 at the front portion of the machine and occupying the same relative positions with regard to the star-wheels D′; but the rear guide-boxes 51 are located below the frame A and are supported by brackets 49, secured to the rear cross-bar 34^b, and other brackets 50, which are loosely mounted on the axle 17. Each of the rear vertical striking-arms E^2 is of the same construction, and the construction is practically the same as that of the forward series of striking-arms E′.

Each rear striking-arm E^2 consists of a shank 52, adapted to slide in a guide-box 51, and a beater 52^a at the lower end of the said shank, adapted for engagement with the ground and having its forward end 53 upturned. The shank 52 of each vertical striking-arm E^2 is provided with an offset 54 on one of its sides, and these offsets 54 are above the guide-boxes 51 for the said vertical striking-arms E^2, whereas the corresponding projections 42 from the shanks of the forward vertical striking-arms E′ are below their guide-boxes 39. Above the upper end of the shank of each of the rear vertical striking-arms E^2 a spring 55 is secured to the upper member 13^a of the arched auxiliary frame B′. Thus in the operation of the machine as a point of a star-wheel D′ engages with a piston 38 in a cylinder 36 to elevate a forward striking-arm E′ another point of the star-wheel D′ will engage with the offset 54 of a corresponding or parallel rear striking-arm E^2 to simultaneously lift the latter arm and bring it in engagement with the free end of the spring 55 , which is of the same construction as the spring 47, thus placing the said spring 55 under tension, and the star-wheel will release the piston 38 at the same time that it releases the offset 54 of the rear striking-arm E^2, and consequently the spring of the forward striking-arm and the spring of the rear striking-arm will act simultaneously to force the two arms down to an engagement with the ground.

While primarily the machine is adapted for the pulverization of the soil previously plowed and perhaps harrowed, the machine may be used for digging, cutting up, and pulverizing a soil not previously plowed or harrowed by attaching suitable tools to the ends of the striking-arms. The striking-arms may be made entirely of spring-steel and may pass under instead of over the axle and may be acted upon by springs carried by the axle. I desire it also to be understood that the star wheels or disks may be made to raise all of the striking-arms simultaneously, or alternately, or in any desired order.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for working the soil, a frame, means for supporting the frame, a shaft mounted in the frame, a striking-arm constructed of spring material at its inner end and having a partial coil at said inner end attached to said shaft, a beater located at the rear end of the arm and adapted for engagement with the ground, a trip device provided with offsets for lifting and releasing engagement with the said arm, and means for actuating the trip device.

2. In a machine for working the soil, a wheel-supported frame, a shaft mounted in the frame parallel with the axle, a striking-arm constructed of spring material at its inner end and having a partial coil at said inner end attached to the said shaft, said arm being carried across the axle and downward to the rear of the frame, a beater located at the rear end of the arm, adapted for engagement with the ground, and a trip device mounted to rotate with the axle, the said trip device being provided with offsets for lifting and releasing engagement with the said arm.

3. In a machine for working the soil, a wheel-supported frame, a shaft mounted in the said frame parallel with the axle thereof, a striking-arm having a spring-controlled connection with the said shaft at its forward end, which arm extends downward and rearward beyond the frame, a beater removably attached to the lower end of the arm, adapted for engagement with the ground, a rotary trip device secured upon the said axle, having points for engagement with the said arm to lift the same and to release it when lifted, a tension device placed in action by engagement with the said arm when elevated and prior to the release of the arm, and independent means for lifting the beater into inoperative position.

4. In a machine for working the soil, a wheel-supported frame, a shaft mounted in the same frame parallel with the axle thereof, a striking-arm having a spring-controlled

connection with the said shaft at its forward end, which arm extends downward and rearward beyond the frame, a beater removably attached to the lower end of the arm, adapted for engagement with the ground, a rotary trip device secured upon the said axle, having points for engagement with the said arm to lift the same and to release it when lifted, a tension device placed in action by engagement with the said arm when elevated and prior to the release of the arm, a lever attached to the said shaft, a keeper for the said lever, and an auxiliary spring attached to the said arm and to a portion of the frame, which latter spring is placed under tension as the arm is elevated, acting in conjunction with the first-named spring to return the arm forcibly downward when released from the said trip.

5. In a machine for working the soil, the combination with a frame, an axle therefor, wheels secured upon the axle, an auxiliary frame arched over the said axle and attached to the main frame, a shaft journaled in the main frame in front of the axle and parallel therewith, a lever attached to the said shaft, and a locking device for the lever, of a series of striking-arms constructed of spring material at their forward ends, said forward ends being coiled and secured to the said shaft, said arms extending downward and rearward beyond the frame and wheels, beaters removably secured to the said arm and adapted for engagement with the ground, the said arms having projections therefrom, a series of star-wheels secured to the axle, a star-wheel being provided in connection with each striking-arm and the points of the star-wheels being arranged for lifting engagement with the projections from said arms, and springs carried by the frame, one for each arm and acting on said arms to forcibly carry them downward to their normal positions when released from the said star-wheels.

In testimony whereof I have signed my name to this specifiation in the presence of two subscribing witnesses.

LEMUEL FRANKLIN BASSETT.

Witnesses:
EDWARD SWEENY,
GEORGE GROTEFEND.