Dec. 23, 1952 W. WHARTON 2,622,498

CULTIVATING AND TILLING MACHINE

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FIG 1.

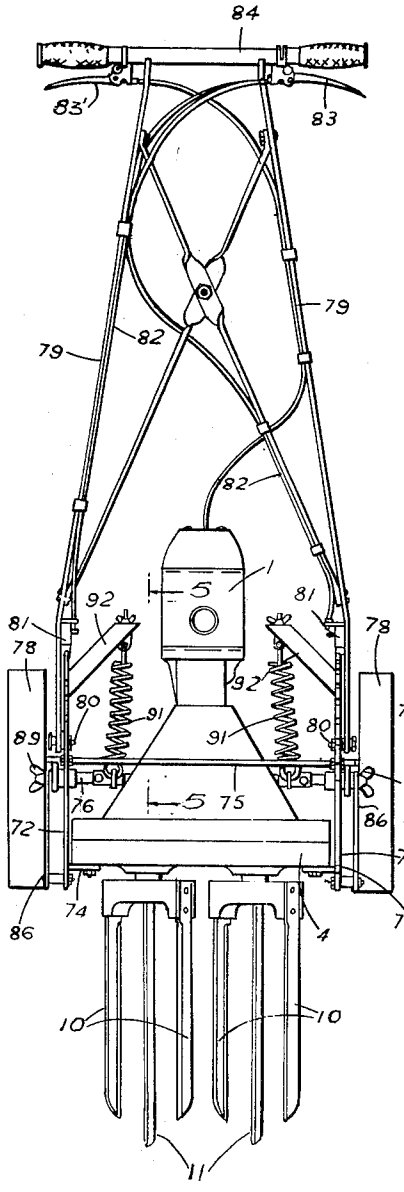
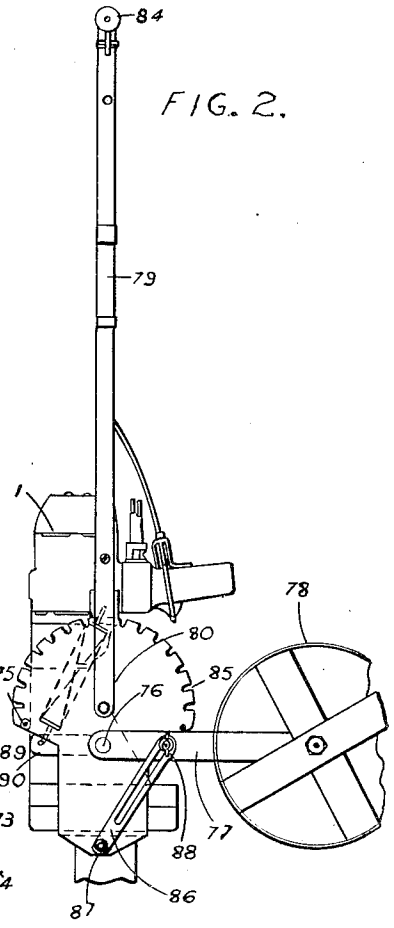



FIG. 2.




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FIG. 3.

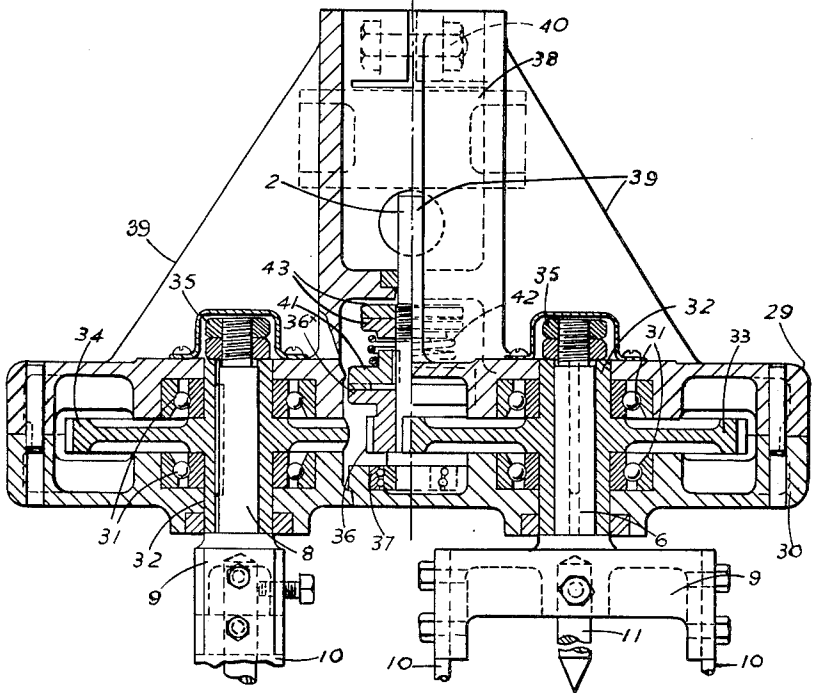
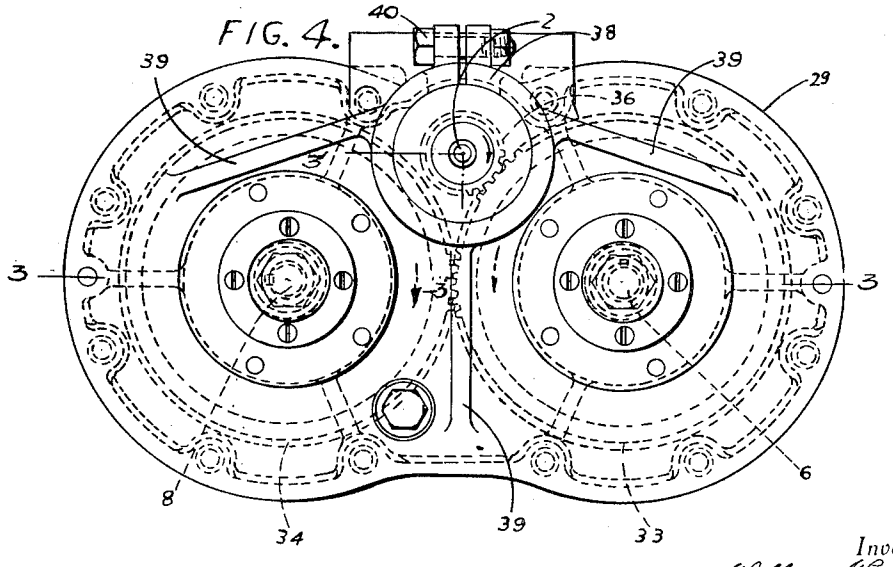



FIG. 4.



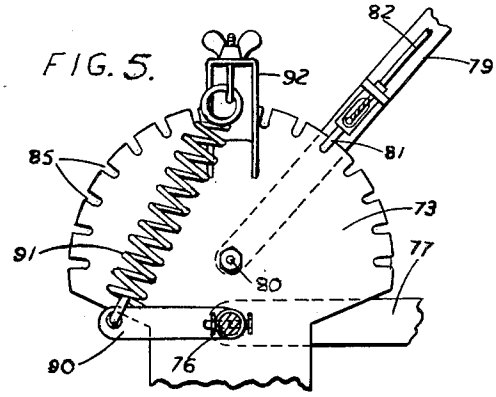

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FIG. 5.



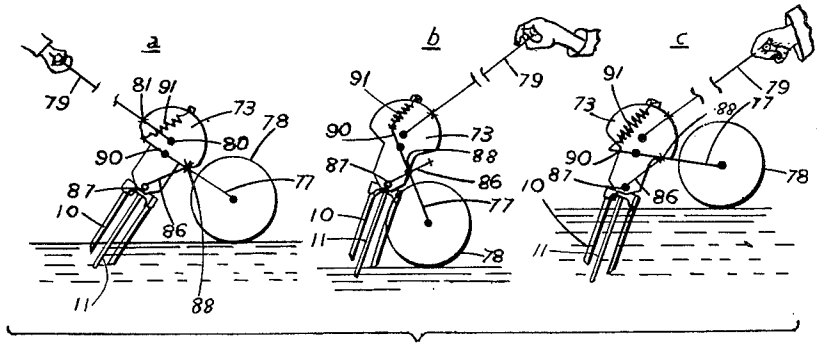




FIG. 6.

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# UNITED STATES PATENT OFFICE

2,622,498

## CULTIVATING AND TILLING MACHINE

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Application June 18, 1946, Serial No. 677,479½
In Great Britain December 15, 1944

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Patent expires December 15, 1964

13 Claims. (Cl. 97—43)

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This invention relates to cultivating and tilling machines and more particularly to machines of the light portable type designed to replace the usual garden tools used for tilling and which can be used in very confined spaces.

According to this invention the machine comprises a motor, and two or more sets of tynes or cultivators arranged so as to absorb the torque reaction set up by the motor, said tynes or cultivators being connected by suitable interposed gearing and means for handling the machine.

The invention further embodies the provision of means for converting the machine into a self-supporting and propelling machine.

In the accompanying drawings which illustrate this invention:

Figures 1 and 2 are front and side elevations respectively of the machine.

Figure 3 is a vertical section on line 3—3 of Figure 4 and partly on line 3'—3' of Figure 4.

Figure 4 is a plan of Figure 3.

Figure 5 is an enlarged view on line 5—5 of Figure 1.

Figure 6(*a*), (*b*) and (*c*) are diagrammatic views illustrating three operating positions.

The machine as illustrated in Figures 1 to 4 comprises an electric motor 1 arranged to drive a vertically disposed spindle 2, hereinafter referred to as the driving spindle.

The gearing by means of which the cultivator units are driven preferably takes the form illustrated in Figures 3 and 4 in which the housing 4 is formed in two halves 29 and 30, each of which is provided with recesses in which ball bearings 31 are fitted in which bearings are mounted the sleeve portions 32 of intermeshing gear means 33, 34 in which the driven cultivator spindles 6 and 8 provided on the cultivator units are secured by the nuts 35. The gear wheel 33 is arranged to mesh with a smaller gear wheel 36 interconnected with the driving motor spindle 2, the lower end of which is supported in a ball bearing 37. The upper half 29 of the casing is furnished with a split socket element 38 cast integral with said casing and strengthened by webs 39 disposed on either side and in front of said socket which is designed to receive a spigot formed on the lower part of the motor 1, said spigot being secured in the socket by the bolt 40.

For the purpose of preventing excessive strains being transmitted to the gearing and/or motor in the event of the tynes 10 striking stones and like obstructions, the gear wheel 36 is formed integral with one element 36x of a clutch device, and the coacting element 41 of said clutch device

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is arranged to slide on and rotate with the driving spindle 2, and is pressed into engagement with the clutch element 36x by a coiled spring 42, the compression of which may be adjusted by the nuts 43.

The motor 1 may be supplied with electric current derived from any convenient source, which may be led direct to the motor or to a control switch 33' mounted on handle bar 84.

The machine may be pushed or driven along the road, path, or ground by depressing the handle 84 so as to lift the tynes 10 free from the ground. The motor may be used to effect propulsion, or the machine may be pushed along by hand to the desired plot it is desired to till; when on the ground the motor, with the tynes still lifted free, is started, the tynes may now be lowered into the ground and the machine will travel forwardly.

A pair of planes 72—73 are secured by brackets 74 bolted to the casing 4, said plates being maintained in correct spaced relationship by a tie bar 75 and by a bar 76 upon which is pivoted a wheel frame comprising a pair of arms 77 on the free ends of which are mounted a pair of wheels 78 by means of which the machine is supported and transported. The handle for controlling the movements of the machine comprises the longitudinal members 79, stayed together by suitable tie members, the free ends of said members are pivotally mounted on the plates 72, 73 at 80. Each of the members 79 is provided with locking means comprising a spring controlled detent 81 actuated by a flexible cable 82 and lever 83 secured to the handle bar 84. The detents 81 are arranged to engage in peripheral slots 85 provided in the plates 72—73 (as clearly shown in Figure 5). The arms 77 may be locked relatively to the body of the machine by a pair of slotted links 86 pivoted at 87 to the lower part of the plates 72, the arms 77 are provided with a fixed pin 88 on which the slotted links 86 are arranged to slide when the wing nuts 89 have been released. The bar 76 has rigidly secured thereto a pair of short levers 90, the free ends of said levers are connected by springs 91 to the outer ends of a pair of brackets 92 secured to the plates 72.

Referring to the diagrammatic views illustrated in Figure 6, in the position (*a*) the slotted links 86 are clamped to the arms 77 and the machine is being drawn through the ground for light cultivation, in the positions (*b*) and (*c*) the links 86 are free to slide on the pins 88 so that with the machine in the position shown at (*b*) if the handle 84 is pressed forward so that the tynes

10 become slightly embedded in the soil, their particular formation causes them to work their way into the ground until the machine occupies the position shown at (c) if now the handle 84 is drawn towards the operator the tynes break up the soil and the springs 91 serve to draw the said tynes out of the ground with little additional effort on the part of the operator. The machine may then be drawn rearwardly to a new position, and the operation repeated.

Should it be desired to till in very confined spaces such as between shrubs or plants in a flower bed, the spikes 11 secured to the tyne bar, prevent side or endwise movement, the machine being lifted from the soil and placed in a different position by hand between each cut.

What I claim is:

1. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; a pair of spaced vertical plate members fixedly secured to said housing member; a handle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; a wheel frame secured to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; and control means carried at the free end of said handle member for remotely and manually effecting operative engagement between said handle member and said pair of spaced plate members in a predetermined angular position.

2. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; each of said cultivator units including at least two elongated, substantially parallel tyne members; a pair of spaced vertical plate members fixedly secured to said housing member; a handle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; a wheel frame secured to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; and control means carried at the free end of said handle member for remotely and manually effecting operative engagement between said handle member and said pair of spaced plate members in a predetermined angular position.

3. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; each of said cultivator units including at least two elongated, substantially parallel tyne members and a substantially axially disposed, pointed, spike element; a pair of spaced vertical plate members fixedly secured to said housing member; a handle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; a wheel frame secured to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; and control means carried at the free end of said handle member for remotely and manually effecting operative engagement between said handle member and said pair of spaced plate members in a predetermined angular position.

4. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; a pair of spaced vertical plate members fixedly secured to said housing member; a handle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; a wheel frame pivoted to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; manually adjustable link means attached to said plate members and to said wheel frame at points spaced from the pivoting point of the same for varying the angular inclination of said housing member and cultivator units with respect to said wheel frame and to the soil supporting said wheels; and control means carried at the free end of said handle member for remotely and manually effecting operative engagement between said handle member on one hand and said pair of spaced plate members and said housing member on the other hand in a predetermined angular position.

5. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; each of said cultivator units including at least two elongated, substantially parallel tyne members; a pair of spaced vertical plate members fixedly secured to said housing member; a handle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; a wheel frame pivoted to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; manually adjustable link means attached to said plate members and to said wheel frame at points spaced from the pivoting point of the same for varying the angular inclination of said housing member and cultivator units with respect to said wheel frame and to the soil supporting said wheels; and control means carried at the free end of said handle member for remotely and manually effecting operative engagement between said handle member and said pair of spaced plate members in a predetermined angular position.

6. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; each of said cultivator units including at least two elongated, substantially parallel type members and a substantially axially disposed, pointed, spike, element; a pair of spaced vertical plate members fixedly secured to said housing member; a handle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; a wheel frame pivoted to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; manually adjustable link means attached to said plate members and to said wheel frame at points spaced from the pivoting point of the same for varying the angular inclination of said housing member and cultivator units with respect to said wheel frame and to the soil supporting said wheels; and control means carried at the free end of said handle member for remotely and manually effecting operative engagement between said handle member and said pair of spaced plate members in a predetermined angular position.

7. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; a pair of spaced vertical plate members fixedly secured to said housing member, each of said plate members having a plurality of slots extending inwardly from the peripheral edge thereof; a han-

dle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; said handle member having detents selectively engageable within said peripheral slots; a wheel frame pivoted to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; and control means carried at the free end of said handle member for remotely actuating said detents in order to dispose said handle member in a predetermined angular position.

8. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; each of said cultivator units including at least two elongated, substantially parallel tyne members and a substantially axially disposed, pointed, spike element; a pair of spaced vertical plate members fixedly secured to said housing member, each of said plate members having a plurality of slots extending inwardly from the peripheral edge thereof; a handle member pivotally secured to said plate members and adjustable to a predetermined angular position with respect thereto; said handle member having detents selectively engageable within said peripheral slots; a wheel frame pivoted to said plate members at one end thereof and carrying at the opposite end thereof a pair of supporting wheels for the device; manually adjustable link means attached to said plate members and to said wheel frame at points spaced from the pivoting point of the same for varying the angular inclination of said housing member and cultivator units with respect to said wheel frame and to the soil supporting said wheels; and control means carried at the free end of said handle member for remotely actuating said detents in order to dispose said handle member in a predetermined angular position.

9. A cultivating and tilling device comprising a housing member; at least two rotatable cultivator units depending from said housing; a pair of spaced vertical lug means fixedly secured to said housing member; a handle member pivotally secured to said lugs and adjustable to various predetermined angular positions with respect to said housing member; locking means on said handle member for holding the same in any one of said various predetermined angular positions with respect to said housing member; and manually operable control means on said handle member cooperating with said locking means to lock said handle member in a selected one of said various predetermined angular positions with respect to said lug means and to said housing member, whenever desired.

10. A cultivating and tilling device comprising a housing member having a top wall and a bottom wall; at least two cultivator units, each including a cultivator shaft; bearing members arranged in said bottom wall of said housing member through which said cultivator shafts project into said housing member, the axes of said bearing members extending parallel in a downward direction so that said cultivator shafts extend also parallel in a downward direction and said cultivator units rotate about parallel downwardly directed axes of rotation; a motor mounted on said top wall of said housing member; a motor shaft forming part of said motor and extending into said housing member in a direction parallel to the parallel axes of rotation of said cultivator units; first gear means arranged within said housing member extending in a plane normal to said axes of rotation of said cultivator units and operatively connecting said motor shaft with one of said cultivator shafts so that said motor rotates this cultivator shaft during operation of the motor in a clockwise direction; and second gear means arranged within said housing member extending also in a plane normal to said axes of rotation of said cultivator units and operatively connecting said motor shaft with the other of said cultivator shafts so that said motor rotates said other cultivator shaft in a counter-clockwise direction; wheel means mounted on said housing member for supporting the same; a pair of plate members fixedly secured to said housing member; and upwardly extending handle means pivotally mounted on said plate members.

11. A cultivating and tilling device comprising a housing member having a top wall and a bottom wall; at least two cultivator units, each including a cultivator shaft; bearing members arranged in said bottom wall of said housing member through which said cultivator shafts project into said housing member, the axes of said bearing members extending parallel in a downward direction so that said cultivator shafts extend also parallel in a downward direction and said cultivator units rotate about parallel downwardly directed axes of rotation; a motor mounted on said top wall of said housing member; a motor shaft forming part of said motor and extending into said housing member in a direction parallel to the parallel axes of rotation of said cultivator units; first gear means arranged within said housing member extending in a plane normal to said axes of rotation of said cultivator units and operatively connecting said motor shaft with one of said cultivator shafts so that said motor rotates this cultivator shaft during operation of the motor in a clockwise direction; second gear means arranged within said housing member extending also in a plane normal to said axes of rotation of said cultivator units and operatively connecting said motor shaft with the other of said cultivator shafts so that said motor rotates said other cultivator shaft in a counter-clockwise direction; wheel means mounted on said housing member for supporting said housing member; a pair of plate members fixedly secured to said housing member; an upwardly extending handle member pivotally secured to said plate members and adjustable to various predetermined angular positions with respect to said housing member; locking means on said handle member for holding the same in any one of said various predetermined angular positions with respect to said housing member; and manually operable control means carried at the free end of said handle member and connected with said locking means for remotely operating said locking means and thereby lock said handle member in a selected one of said various predetermined angular positions with respect to said plate members and to said housing member, whenever desired.

12. A cultivating and tilling device comprising a housing member having a top wall and a bottom wall; at least two cultivator units, each including a cultivator shaft: bearing members arranged in said bottom wall of said housing member through which said cultivator shafts project into said housing member, the axes of said bearing members extending parallel in a downward direction so that said cultivator shafts extend

also parallel in a downward direction and said cultivator units rotate about parallel downwardly directed axes of rotation; a motor mounted on said top wall of said housing member; a motor shaft forming part of said motor and extending into said housing member in a direction parallel to the parallel axes of rotation of said cultivator units; first gear means arranged within said housing member operatively connecting said motor shaft with one of said cultivator shafts so that said motor rotates this cultivator shaft during operation of the motor in a clockwise direction; second gear means arranged also within said housing member operatively connecting said motor shaft with the other of said cultivator shafts so that said motor rotates said other cultivator shaft in a counter-clockwise direction; wheel means mounted on said housing member for supporting the same; a pair of plate members fixedly secured to said housing member; and upwardly extending handle means pivotally mounted also on said plate members.

13. A cultivating and tilling device comprising a support member; at least two cultivator units each including a cultivator shaft; bearing members on said support member through which said cultivator shafts project into said support member, the axes of said bearing members extending parallel in a downward direction so that said cultivator shafts extend also parallel in a downward direction and said cultivator units rotate about parallel downwardly directed axes of rotation; a motor mounted on said support member; a motor shaft forming part of said motor and extending in a direction parallel to the parallel axes of rotation of said cultivator units; first gear means mounted on said support member and operatively connecting said motor shaft with one of said cultivator shafts so that said motor rotates this cultivator shaft during operation of the motor in a clockwise direction; second gear means mounted also on said support member and operatively connecting said motor shaft with the other of said cultivator shafts so that said motor rotates said other cultivator shaft in a counter-clockwise direction; wheel means mounted on said support member for supporting the same; a pair of plate members fixedly secured to said support member; and upwardly extending handle means mounted also on said plate members.



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