K. V. VON MEYENBURG.

TILLING MACHINE.

APPLICATION FILED FEB. 4, 1914.

1,241,173. Patented Sept. 25, 1917.

FIG. 1.

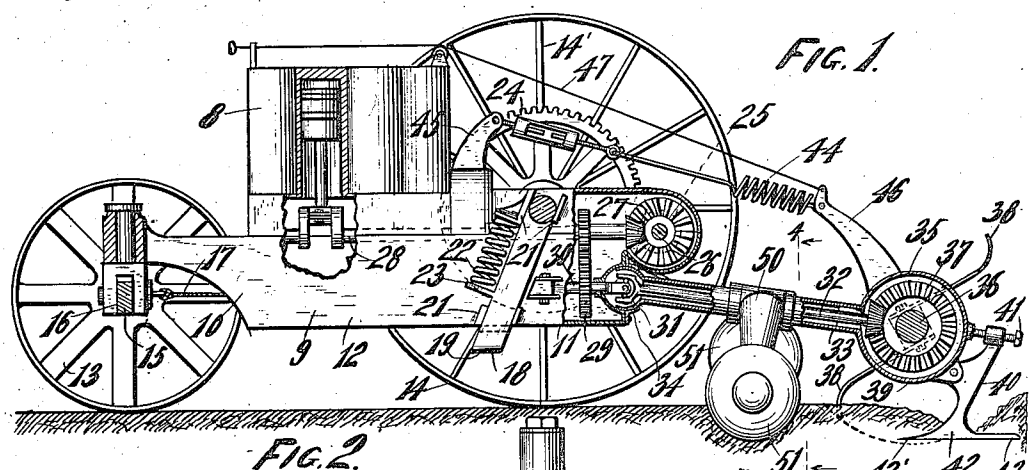


FIG. 2.

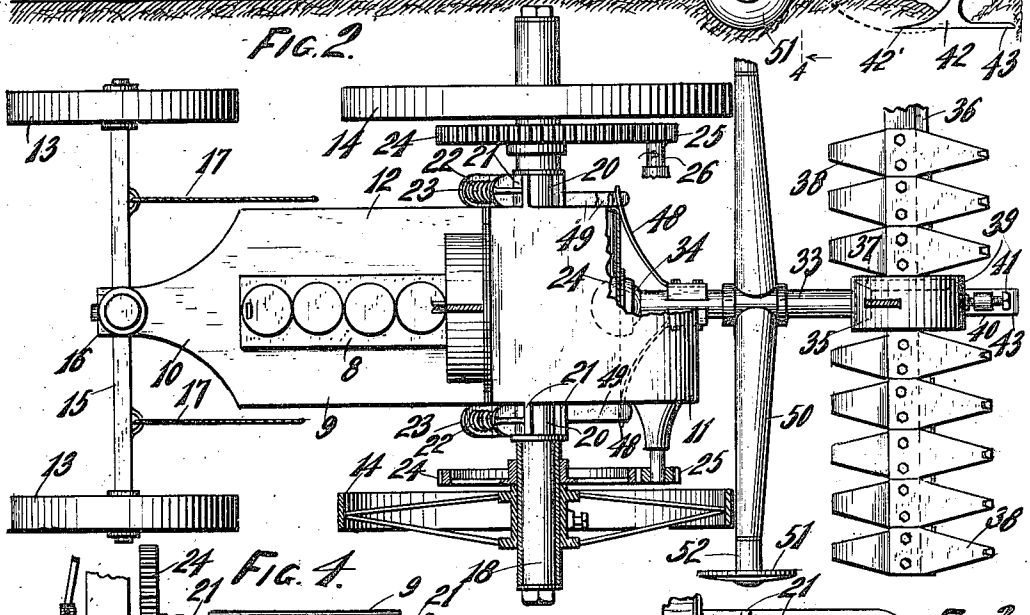


FIG. 4.

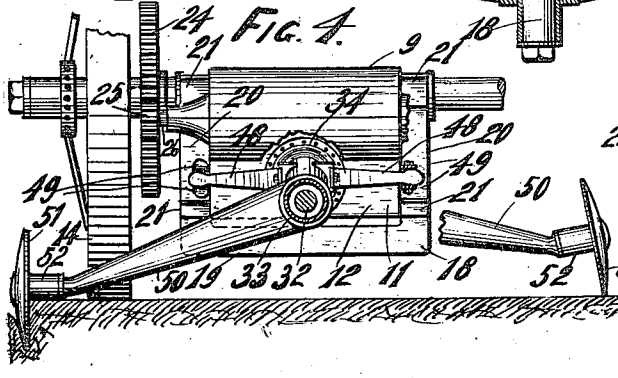
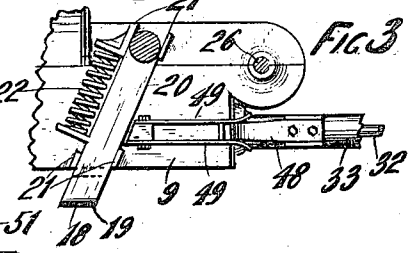


FIG. 3.



WITNESSES

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## TILLING-MACHINE.

1,241,173. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed February 4, 1914. Serial No. 816,515.

*To all whom it may concern:*

Be it known that I, KONRAD VICTOR VON MEYENBURG, a citizen of the Republic of Switzerland, residing in Basel, Switzerland, have invented new and useful Improvements in Tilling-Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in tilling machines of the motor driven type more particularly adapted for plowing and pulverizing the ground.

It is one of the objects of the present invention to provide a tilling machine of the unitary type, that is to say, a construction in which the motor plant itself forms the frame of the machine and all co-acting parts are supplemental thereto.

A further object of the invention is to provide a tilling machine having a rotary tilling tool, which is so constructed as to follow the inequalities of the ground traveled over and thereby evenly till or work the soil.

A further object of the invention is to provide a tilling machine in which the rotary tilling tool is yieldingly connected to the main portion of the machine to give said tool a tendency to maintain its proper position relative to the traction portion of the machine while following the inequalities of the ground traveled over.

A further object of the invention is to provide a tilling machine with an adjustable shoe for regulating the depth of work of the revoluble tilling tool.

A further object of the invention is to provide a tilling machine having a U-shaped axle positioned to guard the chassis of the machine yieldingly mounted thereon against shocks due to the rough surface traveled over.

A further object of the invention is to provide a tilling machine in which the rotary tilling tool thereof is partly supported by a yielding connection to facilitate the lifting of the tool in passing over obstacles.

A further object of the invention is to provide a tilling machine in which the traction mechanism is of a yielding construction and the driving connection therewith is relieved of jolts and shocks by arranging the drivers or other wheels to give in a direction away from the direction of torque of the driving mechanism.

A further object of the invention is to provide a tilling machine with means for guiding the tilling tool in a line parallel with the last furrow worked regardless of the inequalities of the ground or the inexact steering of the machine.

A further object of the invention is to provide a tilling machine of simple construction, which is strong and durable and is well adapted for the purpose described.

With the above and other objects in view the invention consists of the improved tilling machine and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Figure 1 is a side view of the improved tilling machine, portions being shown in section to illustrate interior construction;

Fig. 2 is a top view thereof with parts also in section;

Fig. 3 is a detail view of a side portion of the machine, portions being in section; and

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 1.

Referring to the drawing the numeral 8 indicates a four cylinder internal combustion engine and 9 the crank case thereof which is provided with forward and rearward extensions 10 and 11 respectively to form an elongated crank case. These extensions, while preferably cast integral with the crank case to form a rigid structure, may be formed separate therefrom, if desired. The crank case with the extensions form the main frame 12 upon which are mounted the working parts of the machine and the supporting wheels 13 and 14. The forward steering wheels 13 are journaled on a tilting axle 15 which is pivoted to a king bolt member 16 and the king bolt member is in turn pivoted to the forward extension 10 of the frame. The axle may be steered in any manner desired by means of the steering cables 17.

The rear or traction wheels 14 are journaled on the outer end portions of a cranked axle 18, the cranked portion 19 being posi-

tioned medially of the axle and depending downwardly to accommodate the rearward extension of the crank case. The vertical portions 20 of the cranked axle are inclined forwardly and downwardly in a direction in line with the direction of strain or shock in striking an obstruction, and are slidably connected to the opposite sides of the rear portion of the crank case frame by means of guide projections 21. Coiled springs 22 interposed between the upper forward guide projections and axle projections 23 serve to relieve the frame of the shocks received by the traction wheels and the cranked axle. The spokes 14′ of the traction wheels are of the flexible type to also eliminate or absorb torsional vibration and shocks.

The traction wheels 14 have gear wheels 24 connected thereto which are in mesh with pinions 25 mounted on a transverse shaft 26. The shaft 26 is journaled in the crank case and has a bevel gear connection 27 with the cranked shaft 28 of the engine 8. It will be noted that the gear wheels 24 are engaged by the pinions 25 in the rear of the cranked axle thus permitting the traction wheels and gear wheels to give in a direction away from the direction of torque of the pinions and that by this arrangement and location of the parts the gear teeth are relieved of the shocks imparted to the traction wheels.

The crank case is provided with a transmission gear mechanism 29 (only a part being shown) of ordinary construction for changing the speed of the parts, and to the rear end of the shaft 30 of this mechanism is connected by a universal joint 31, a tiltable shaft 32. The tiltable shaft is inclosed within a tubular arm or housing 33, the forward end of which has a ball and socket connection 34 with the rear end portion of the crank case and surrounding the universal joint and movable coincident therewith. The ball and socket connection of the arm 33 permits said arm to revolve as well as to swing to different angles.

The rear end of the tubular arm carries a bearing and gear casing 35 in which is journaled a transverse tool shaft 36 and this shaft is driven by a bevel gear connection 37 or other driving means by the tiltable shaft 32. The tiltable shaft and the tiltable tubular arm extend rearwardly from a medial portion of the crank case frame and likewise engage a medial rounded portion of the tool shaft, so that the said shaft and the tilling tools 38 mounted thereon can follow the inequalities of the ground traveled over. The transverse shaft and the tools form the rotary tilling member of the machine.

The tools 38, while shown as formed of plates of metal curved forwardly at their outer ends in the direction of travel of the machine, may be differently constructed, if desired.

In providing the medial connection of the tilling shaft there will necessarily be a medial space 39 not provided with tilling tools and consequently in tilling the ground a tongue or narrow strip of soil is left between the tilling tools. To remove this strip and to also regulate the depth of cut of the tilling tools a shoe member 40 is provided which is medially pivotally connected to the gear casing 35. The upper end of the member is provided with a bolt 41 for adjusting the angle of the shoe and the lower end portion 42 of the member is in the form of a plow or shoe, having a straight base line with a forward point 42′ and a rearward extension 43. By inclining the base line of the shoe member downwardly or upwardly the depth of the cut of the tilling tools may be regulated like in plows, and at the same time the shoe member serves to plow and break up the tongue of earth left by the tilling tools.

The rotary tilling member is partly supported by means of a coiled spring connection 44 attached at one end to an upstanding arm 45 of the crank case and at its other end to an upstanding arm 46 of the casing 35, the angular relation of the spring pull to the universal joint helping to equalize the balance. The arm 46 is also provided with a cable or other connection 47 with the upper portion of the engine so that, when desired, the rotary tilling member may be easily raised upwardly and out of contact with the ground.

In order to yieldingly hold the tiltable tubular arm in a central position with relation to the vehicle proper the said arm is provided with flat spring members 48 attached to opposite sides thereof which diverge outwardly forwardly, and their outer ends are interposed between the free ends of rearwardly extending spring members 49 mounted on the side portions of the crank case chassis, the connection between spring members 48 and 49 being in transverse alinement with joint 31.

The outer ends of the spring members 48 also bear against the rear corner edges of the crank case frame so that these spring members serve to yieldingly and normally hold the tubular arm 33 in its medial position and at the same time permit the said arm to be raised and lowered and to swing sidewise in passing obstructions and correcting the faults of steering.

The tiltable tubular arm 33 is also provided with a transverse extending guide member 50 having disk wheels 51 journaled on its outer ends, one of which is adapted to travel in the furrow just previously cut and guide the machine in tilling the next parallel furrow. The guide member is pivotally mounted on the tubular arm and is free to swing vertically so that either disk wheels may travel in the furrow and while one

wheel is traveling in the furrow, the other is tilted upwardly to travel on the surface of the unworked soil. The disk wheels are mounted on the guide arm at an angle so that the hubs 52 of the disk wheels will roll upon the surface when the disk wheels are in the furrows below the surface of the soil.

The detail portions of the engine and the various controlling devices have been eliminated from the drawing for simplicity of illustration, but it is to be understood that all necessary parts are contemplated in the complete machine.

From the foregoing description it will be seen that the unitary construction provides for the crank case of the engine carrying all of the stresses and strains of the vehicle and the traction, and that the rotary tilling tool forming part of the machine is well adapted to compensate for the inequalities of the ground and to perform the functions desired.

What I claim as my invention is:

1. A tilling machine, comprising a motor driven vehicle upon which is mounted a transmission mechanism, axles forming part of the vehicle and upon which the supporting and traction wheels are mounted, said traction wheels having a connection with the transmission mechanism and being driven thereby, a tiltable shaft connected to the vehicle and to the transmission mechanism, and a transversely extending rotary tilling member connected medially to and driven by the tiltable shaft.

2. A tilling machine, comprising a motor driven vehicle, a transmission mechanism forming part thereof, axles forming part of the vehicle and upon which the traction and supporting wheels are mounted, a driving connection between the transmission mechanism and the traction wheels, a tiltable arm pivotally connected to the vehicle and extending medially rearwardly therefrom, a transversely extending rotary tilling member journaled in the rear end portion of the tiltable arm, a driving connection between the transmission mechanism and the tilling member, and a means connected to the tiltable arm for controlling the depth of the furrow cut by the tilling member.

3. A tilling machine, comprising a motor driven vehicle, a transmission mechanism forming part thereof, axles connected to the vehicle and upon which the traction and supporting wheels are mounted, a driving connection between the transmission mechanism and the traction wheels, a tiltable arm pivotally connected to the vehicle and extending medially rearwardly therefrom, a transversely extending rotary tilling member journaled in the rear end portion of the tiltable arm, a driving connection between the transmission mechanism and the tilling member, means for guiding the tilling member in a line approximately parallel with an adjacent furrow, and a means connected to the tiltable arm for controlling the depth of the furrow cut by the tilling member.

4. A tilling machine, comprising a motor driven vehicle, a transmission mechanism forming part thereof, means for driving the transmission mechanism, axles connected to the vehicle and upon which the traction and supporting wheels are mounted, a driving connection between the transmission mechanism and the traction wheels, a tiltable arm pivotally connected to the vehicle and extending medially rearwardly therefrom, a transversely extending rotary tilling member journaled in the rear end portion of the tiltable arm, a driving connection between the transmission mechanism and the tilling member, a transversely extending tiltable member connected to the tiltable arm and having wheels on its outer ends for guiding the tilling member in a line approximately parallel with an adjacent furrow, and a means connected to the tiltable arm for controlling the depth of the furrow cut by the tilling member.

5. A tilling machine, comprising a motor driven vehicle, a transmission mechanism forming part thereof, means for driving the transmission mechanism, axles connected to the vehicle and upon which the traction and supporting wheels are mounted, a driving connection between the transmission mechanism and the traction wheels, a tiltable arm pivotally connected to the vehicle and extending medially rearwardly therefrom, a transversely extending rotary tilling member journaled in the rear end portion of the tiltable arm, a driving connection between the transmission mechanism and the tilling member, and a shoe member pivotally connected to the rear end portion of the tiltable arm for controlling the depth of the furrow cut by the tilling machine and for breaking up a portion of the soil unworked by the tilling member.

6. A tilling machine, comprising a motor driven wheel, a transmission mechanism forming part thereof, means for driving the transmission mechanism, axles connected to the vehicle and upon which the traction and supporting wheels are mounted, a driving connection between the transmission mechanism and the traction wheels, a tiltable arm pivotally connected to the vehicle and extending medially rearwardly therefrom, a transversely extending rotary tilling member journaled in the rear end portion of the tiltable arm, a driving connection between the transmission mechanism and the tilling member, a transversely extending tiltable member connected to the tiltable arm and having means on its outer ends for guiding the tilling member in a line approximately parallel with an adjacent furrow, and a shoe

member pivotally connected to the rear end portion of the tiltable arm for controlling the depth of the furrow cut by the tilling machine and for breaking up a portion of the soil unworked by the tilling member.

7. A tilling machine, comprising a motor driven vehicle, a transmission mechanism forming part thereof, means for driving the transmission mechanism, axles connected to the vehicle and upon which the traction and supporting wheels are mounted, a driving connection between the transmission mechanism and the traction wheels, a tiltable arm pivotally connected to the vehicle and extending medially rearwardly therefrom, means for yieldingly holding the tiltable arm in a predetermined position, a transversely extending rotary tilling member journaled in the rear end portion of the tiltable arm, a driving connection between the transmission mechanism of the motor of the vehicle and the tilling member, a transversely extending tiltable member mounted on the tiltable arm and having wheels on its outer ends for guiding the tilling member, and a shoe member pivoted to and depending from the tiltable arm for breaking up a portion of the soil unworked by the tilling member.

8. A tilling machine, comprising a motor driven vehicle, an arm having a universal joint connection with the rear portion of the vehicle, a transversely extending rotary tilling member medially journaled in the rear end portion of the arm, a driving connection between the transmission mechanism of the motor of the vehicle and the tilling member, and means for regulating the depth of the cut of the tilling member.

9. A tilling machine, comprising a motor driven vehicle, a tubular arm extending rearwardly from the vehicle and having a universal joint and revoluble connection with the frame, a transversely extending rotary tilling member journaled medially in the free end of the tubular arm, a driving shaft positioned within the tubular arm and having a universal joint connection with the transmission mechanism of the motor of the vehicle and concentric with the universal joint of the tubular arm, the outer end of said driving shaft having a driving connection with the tilling member, and means for regulating the depth of cut of the tilling member.

10. A tilling machine, comprising a motor driven vehicle on which is contained the transmission mechanism and to which the supporting and traction wheels are connected, a shaft having a universal joint connection with the transmission mechanism and depending rearwardly therefrom, a transversely extending rotary tilling member having a medial driving connection with the free end of said shaft, and an arm flexibly connected to the vehicle structure and connected to the tilling member and inclosing the shaft and the driving connection thereof.

In testimony whereof, I affix my signature, in presence of two witnesses.

KONRAD VICTOR VON MEYENBURG.

Witnesses:
C. H. KEENEY,
EMILY SCHOWALTER.