A. T. BROWN.

TRACTION MACHINE.

APPLICATION FILED JAN. 11, 1913.

1,247,073.

Patented Nov. 20, 1917.

5 SHEETS-SHEET 1.

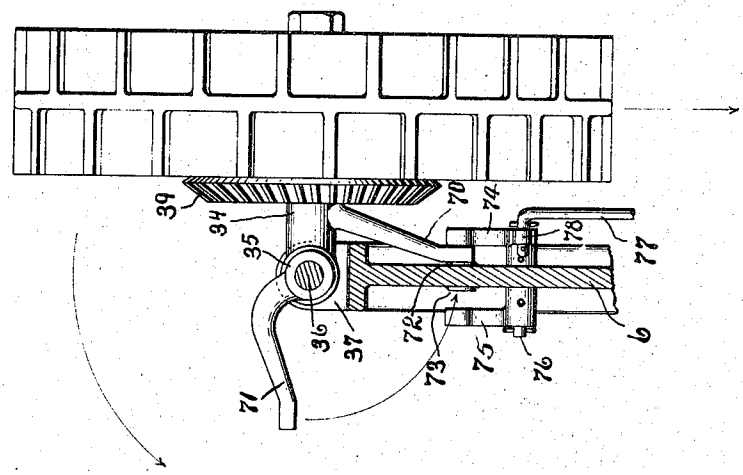


Fig. 8.

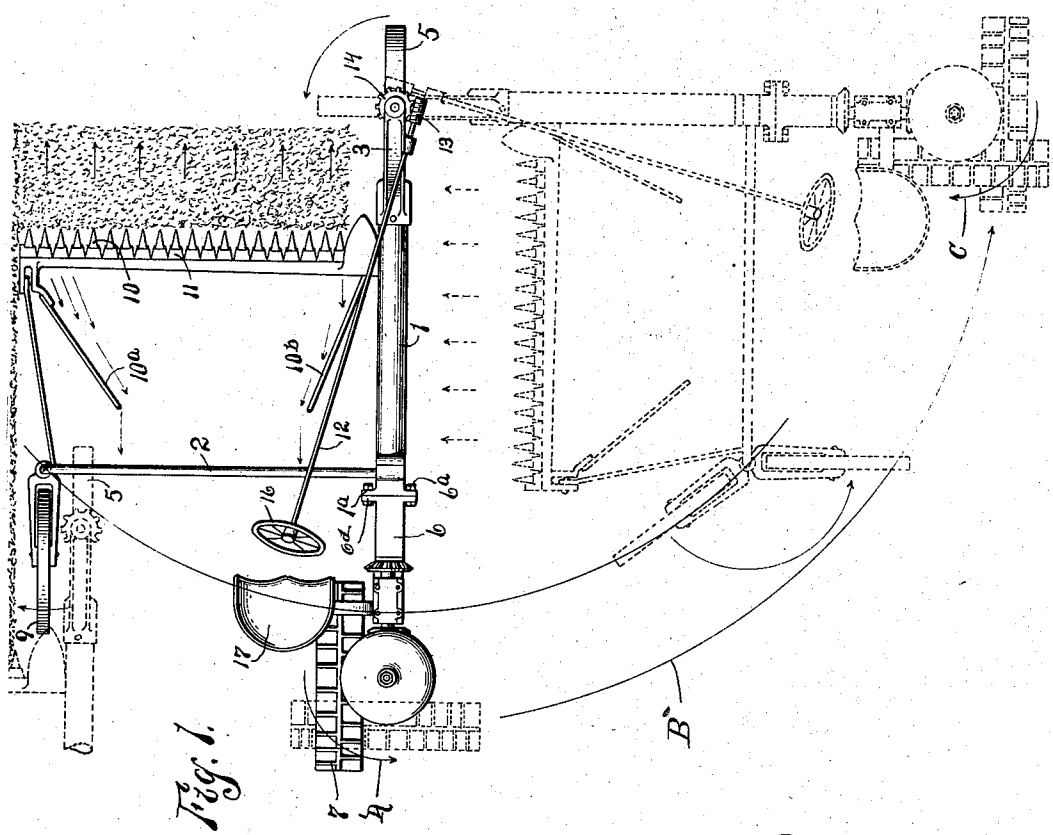


Fig. 1.

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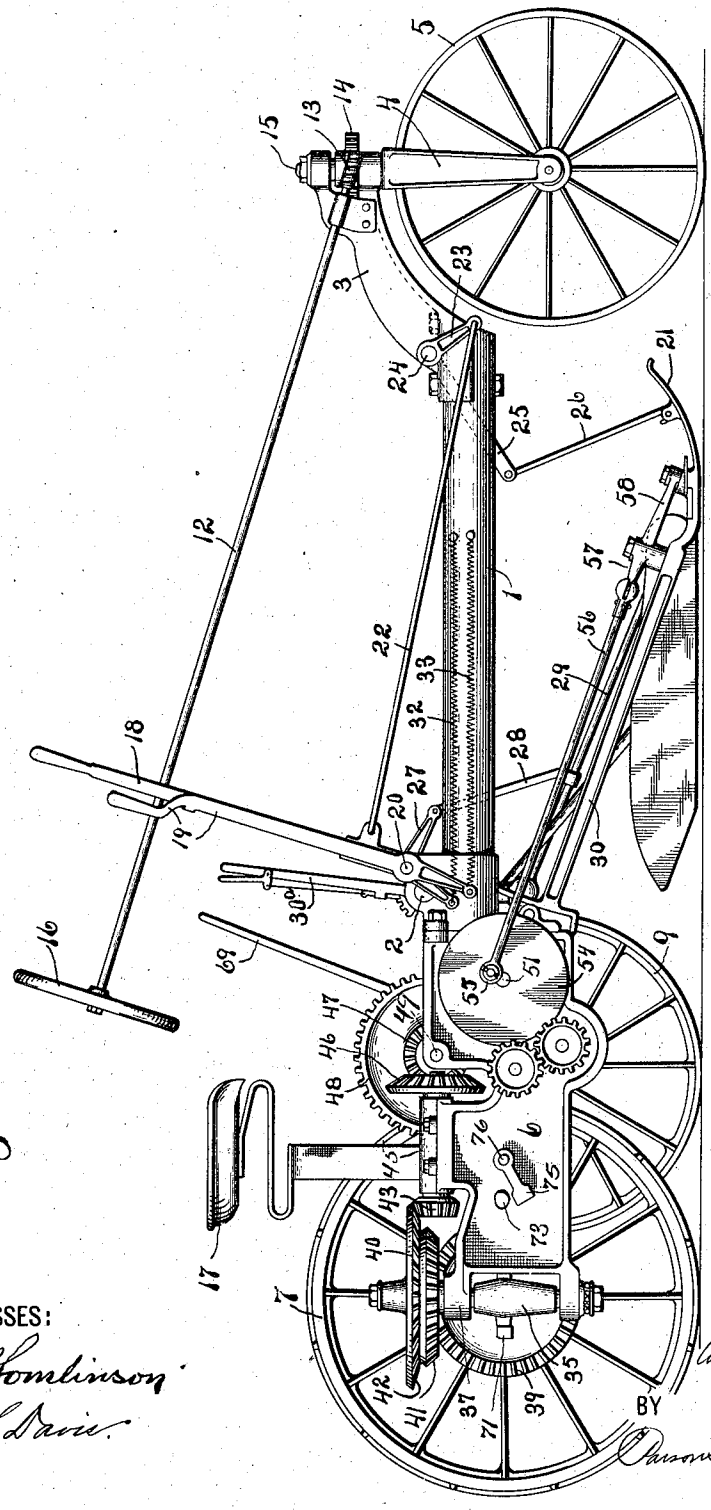


Fig. 2.

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5 SHEETS—SHEET 3.

Fig. 4.

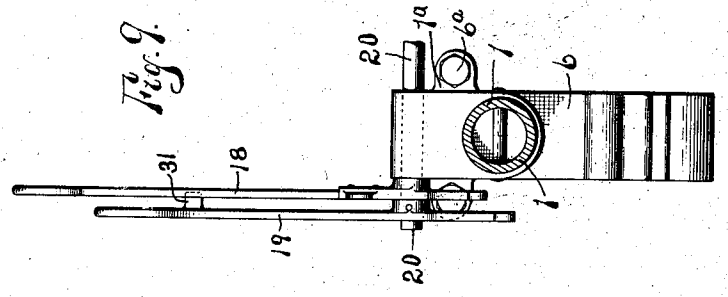


Fig. 3.

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5 SHEETS—SHEET 4.

Fig. 4

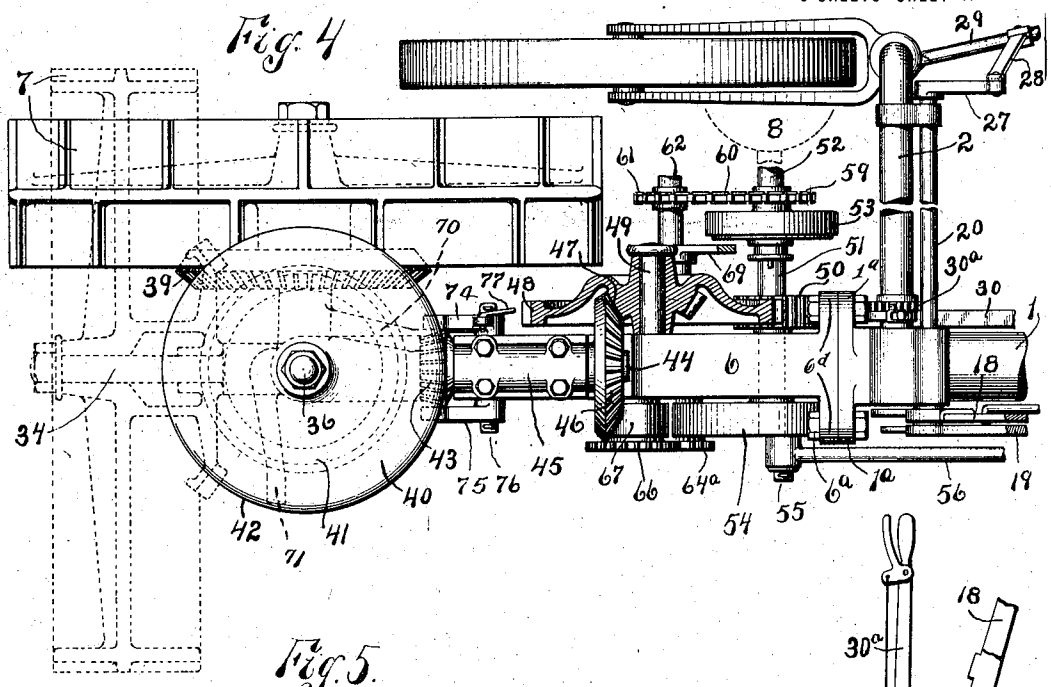
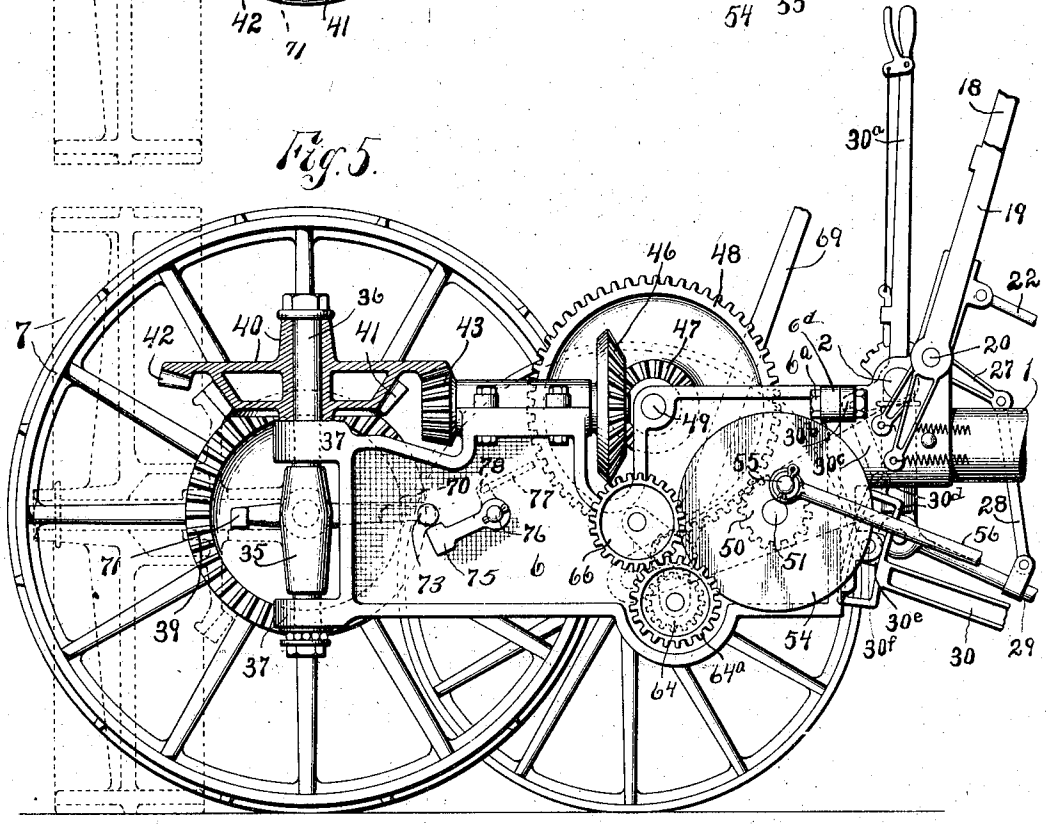


Fig. 5.



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5 SHEETS—SHEET 5.

Fig. 6.

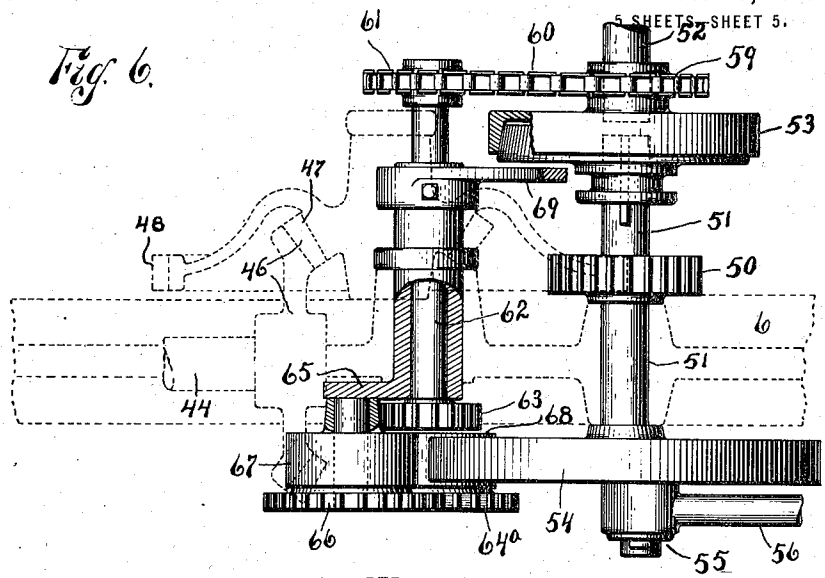
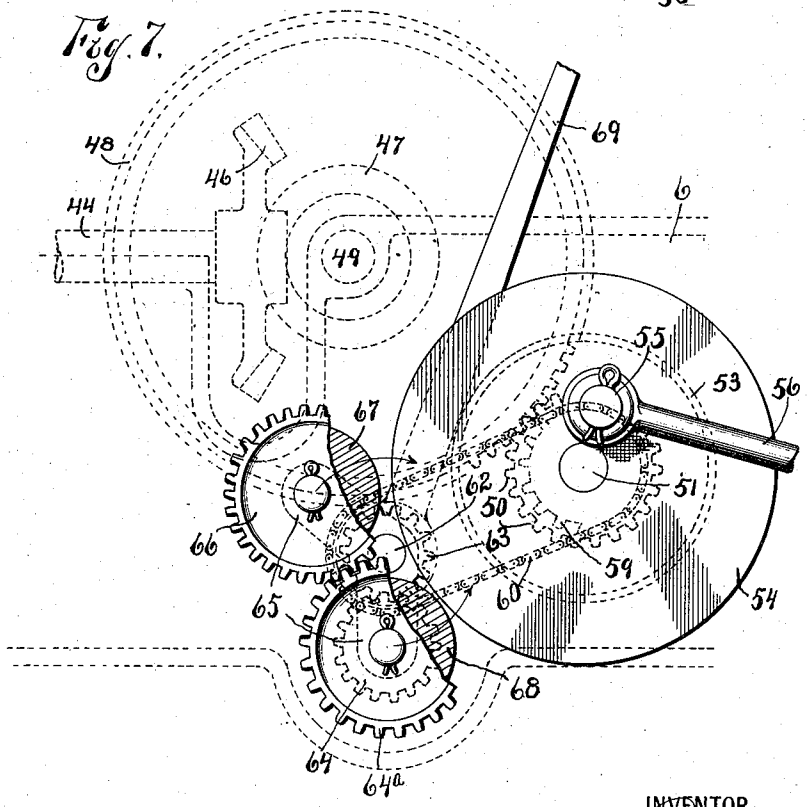


Fig. 7.



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ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TRACTION-MACHINE.

1,247,073. Specification of Letters Patent. Patented Nov. 20, 1917.

Application filed January 11, 1913. Serial No. 741,475.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, of Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Traction-Machine, of which the following is a specification.

This invention has for its object the production of a tractor particularly applicable for carrying agricultural implements, which tractor is particularly simple in construction and highly efficient and durable in use, and it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a diagrammatic plan view of this machine, the operation of the machine when turning a corner being indicated in dotted lines.

Fig. 2 is a side elevation of my machine.

Fig. 3 is a plan view thereof.

Fig. 4 is an enlarged plan view, partly broken away and partly in section, illustrating particularly the connections between the motor and the driving and turning wheel.

Fig. 5 is an elevation, partly in section, of parts seen in Fig. 4.

Fig. 6 is a detail view of the connections between the motor, the driving and turning wheel and the movable member of the implement, parts being indicated in dotted lines.

Fig. 7 is an elevation of parts seen in Fig. 6.

Fig. 8 is a view looking downwardly on the driving and turning wheel and the contiguous part of the frame which is shown in section.

Fig. 9 is a detail view of the levers for raising and lowering the finger bar, contiguous parts being also shown.

This machine comprises, generally, a frame, a steering wheel, a driving and corner-turning wheel connected to the frame by an upright pivotal connection, an implement supported by the frame, a motor supported by the frame, and manually controlled connections between the motor and the driving and turning wheel.

In the illustrated embodiment of my invention, the steering wheel is arranged at the front end of the frame, the driving and turning wheel at the rear end of the frame, the wheels being arranged to travel in substantially the same path; the connections between the motor and the driving or turning wheel are constructed so that the driving and turning wheel turns about the axis of its axle in a forward direction when in its normal position and drives the machine in a straight line or in a line determined by the operation of the front steering wheel, and turns about its upright axis or pivotal connection to the frame when driven in the reverse direction and hence assumes an angular position relatively to the frame until limited in its pivotal movement, so that further driving power causes the rear end of the frame to swing about the axis of the fork of the steering wheel; and the means for operating the steering wheel is constructed to hold the steering wheel rigid during the turning of the machine by the driving and turning wheel so that the steering wheel maintains its normal position relatively to the machine during the turning of the machine.

After the machine has been turned at a corner, driving force, applied to the driving or turning wheel in a forward direction, first turns the wheel about its pivotal axis until it reaches its normal position whereupon the machine will be driven forwardly under the guidance of the steering wheel.

The frame includes, generally, sections detachably secured together, the implement and steering wheel being supported by one section, the driving and turning wheel being connected to the other section; and the motor, power-transmitting connections between the motor and the driving and turning wheel, and means for controlling the operation of said connections being carried by the last-mentioned frame section.

In the illustrated embodiment of my invention, the frame comprises a lengthwise section or beam 1 having a laterally extending element 2, and means 3 at its front end for supporting the forks 4 of the steering wheel 5, and a section 6 to which is connected the driving and corner-turning wheel 7, the section 6 supporting the motor 8 and the power-transmitting means operated by the motor. The beam 1 and frame

section 6 are detachably secured together by bolts 6ª passing through opposing flanges 1ª, 6ª provided on the beam 1 and frame section 6 at the abutting ends thereof.

By the construction of the frame, the section 6 containing the motor, driving and turning wheel, and connections can be attached to frame sections 1 carrying different implements.

The frame element 2 is provided with a wheel as a caster wheel 9 at its outer end.

The implement supported by the frame includes a movable member which is actuated by the motor, and the implement here shown is a mower including a finger bar 10 and a reciprocating knife 11, the mower being arranged in front of the frame element 2 and caster wheel and at one side of the beam 1 and the path of the wheels 5 and 7.

The mower is provided with inner and outer swath boards 10ª and 10ᵇ which deflect the grass or grain inwardly so that it will not be run over by the caster wheel 9 or the driving and turning wheel 7.

The steering wheel 5 is arranged to travel in advance of the finger bar and entirely at one side of the standing grass or grain, and in the path cleared by the outer swath board 10ᵇ during the previous trip of the machine across the field as illustrated in dotted lines, Fig. 1, and the driving and turning wheel 7 is also arranged to travel in said path cleared by the outer swath board during the previous trip of the machine. Hence the steering wheel and the driving and turning wheel travel in the same path.

The steering wheel 5 is operated by a rotatable shaft 12 suitably supported by the frame 1 and having a worm 13 at one end meshing with a worm gear 14 on the upright spindle 15 of the forks 4, the shaft 12 having a hand wheel 16 at its other end located within reach of the seat 17 which is supported on the frame section 6.

Either end of the finger bar or mower or both ends thereof may be raised in any suitable manner by any suitable means, to avoid obstructions in the field or to be carried when the machine is being driven to and from the field.

As here shown, the inner and outer ends of the finger bar may be raised and lowered by levers 18 and 19 connected to opposite ends of the finger bar and being connectible together whereby the operation of one lever also operates the other to raise both ends of the finger bar.

As here shown the lever 18 is loosely mounted on a rock shaft 20 extending laterally of the frame and journaled in suitable bearings supported by the frame element 2, and is connected to a shoe 21 at the inner end of the finger bar, by means of a link 22 connecting said lever and a rock arm 23 mounted on a rock shaft 24 at the front end of the beam 1, just in the rear of the steering wheel 5, a rock arm 25 mounted on said shaft 24 and a link 26 connecting the rock arm 25 and the shoe 21.

The lever 19 is fixedly mounted on the rock shaft 20 and has a rock arm 27 at its outer end which is connected by means of a link 28 to a vertically swinging rod 29 supporting the outer end of the finger bar. The shoe 21 is supported by a suitable swinging frame 30 and the parts 29 and 30 swing during the raising of the finger bar about an axis located near the axis of the shaft 2.

The rear end of the swinging frame 30 is adjustable vertically to tilt or direct the edge of the finger bar and knife upwardly or downwardly more or less into different angular relations relatively to the ground, and this adjustment is effected by a lever 30ª mounted on the frame 1 within reach of the seat and having an arm 30ᵇ, Fig. 5, which is connected by a link 30ᶜ to the slotted bearing 30ᵈ at the rear end of the swinging frame 30. The slotted bearing 30ᵈ receives a box 30ᵉ mounted on the pivot 30ᶠ on which the frame 30 swings. The lever 30ª is held in its adjusted position by a pawl operated by a grip lever on the lever 30ª and coöperating with a rack on the beam 1.

The levers 18 and 19 may be connected together in any suitable manner, one way of effecting this result being shown in Fig. 9, in which the lever 19 is shown with a laterally extending lug 31 extending in the rear of the lever 18, the lever 19 being movable laterally against the influence of its own resiliency to disengage the lug 31 from the lever 18. Suitable lifting springs 32 and 33 are connected to the frame and, respectively, to the levers 18 and 19.

34 is an axle upon which the driving and corner-turning wheel 7 is mounted, this axle being connected to the frame by an upright pivotal connection as the upright bearing 35 at the inner end of the axle, and a spindle or shaft 36 extending through the bearings 37 on the portion 6 of the frame and through the bearing 35, see Figs. 4, 5 and 8.

The wheel 7 is movable about its upright axis from its normal position into and out of an angular position relatively to the normal line of travel of the machine, as indicated in dotted lines, Figs. 1, 4 and 5.

The power-transmitting connections between the motor 8 and the driving and turning wheel 7 comprises a gear 39 arranged concentric with the axis of the wheel 7 and fixed thereto, a gear 40 mounted on the spindle 36 and having a gear ring 41 meshing with the gear 39, and a gear ring 42 meshing with a gear 43 mounted on one end of a shaft 44 journaled in a bearing 45 in the frame section 6 and extending lengthwise of the frame, a gear 46 mounted on the front end of said shaft 44 and meshing with a

beveled gear 47 which is integral with a spur gear 48 mounted on a stub shaft 49 extending transversely of the axis of the shaft 44, the spur gear 48 meshing with a gear 50 mounted on a shaft 51 arranged in axial alinement with the motor shaft 52 and connected to the shaft 52 by a clutch 53.

In the normal operation of the machine, the motion is transmitted from the motor shaft 52 to the shaft 51, gear 50, gears 48, 47, beveled gear 46, shaft 44, gears 46, 43, 40 and 39.

A disk 54 is mounted on the shaft 51, Figs. 2, 6 and 7, and is provided with an eccentric 55 which is connected by means of a link 56 to an angular lever 57, one arm of which is connected to the link 56 and the other arm 58 of which is connected to the knife 11 to reciprocate the same.

The gearing above described is utilized when the machine is traveling in a straight line. When, however, it is desired to turn a corner or reverse, reduced speed is provided for, and this is effected preferably through friction means.

As here shown the reduced speed is effected by a sprocket wheel 59 mounted on the motor shaft 52, a chain 60 connecting the sprocket wheel 59 with a sprocket wheel 61 mounted on a shaft 62 and extending parallel to the shaft 52 and the shaft 51, and carrying a spur gear 63 thereon arranged to mesh with a spur gear 64 carried by a pivoted swinging frame 65, the gear 64 being mounted to rotate with a gear 64^a meshing with a similar gear 66, and the gears 64^a and 66 being fixed to friction drums 67 and 68 respectively, which are arranged to be moved into and out of engagement with the periphery of the disk 54, and hence drive the shaft 51 and parts receiving power therefrom.

The frame 65 is mounted to swing on the shaft 62 in order to swing one or the other friction drums 67 and 68 into engagement with the disk 54, the frame being operated by a lever 69 and the friction drums being normally out of engagement with the disk 54.

In the operation of the reduced and reverse speed gearing, the clutch 53 is operated to disconnect the shafts 51 and 52 and the lever 69 operated by swinging one of the drums 67 or 68 into engagement with the disk 54. Assuming that the upper disk 67 is swung into engagement with the disk 54, the motion is transmitted through the chain 60, sprocket wheel 61, shaft 62, gears 63, 64, 64^a and 66, drum 67, disk 54, shaft 51, gear 50, gears 48, 47, beveled gear 46, shaft 44, gears 43, 40, and 39.

The drums 67 and 68 obviously rotate in opposite directions and the direction of rotation of the disk is controlled by shifting one or the other of the disks 67, 68 into engagement therewith. When the upper disk 67 is engaged therewith, the motion is carried to the disk 54 through the gear 66 and reverse direction of rotation of the driving wheel 7 is obtained causing the wheel 7 to also turn about its upright pivotal axis unless restrained from such turning movement.

In operation, when it is desired to turn a corner, the clutch 53 is operated to disconnect the engine shaft 52 from the shaft 51 and the disk 67 shifted into engagement with the disk 54 whereupon the driving and turning wheel will be driven as indicated by the arrow —A— from its normal position shown in Fig. 1 to its position occupied in dotted lines, Fig. 1, in which position, it is limited as will be presently described so that continued movement of the driving wheel 7 through the reduced speed gearing just described will shift the rear end of the implement in the direction of the arrow —B—, Fig. 1, into the position occupied by the machine as indicated in dotted lines, Fig. 1, the frame 1 swinging about the axis of the fork 3 of the steering wheel 5 and the steering wheel 5 remaining rigid with the frame so as to be set in a straight line with the frame after the machine has turned a corner.

When the frame of the implement occupies the desired position to operate on another side of the field, the lever 69 is operated to disconnect the disk 67 and the engine clutch 53 again thrown into operative position actuating the driving and turning wheel in the direction of the arrow —C—, Fig. 1, until it reaches its normal position whereupon the machine progresses in a straight line.

If in turning a corner, the machine is swung too far in the direction indicated by the arrow —B—, Fig. 1, the driving wheel 7 is connected to the disk 54 through the disk 68 and said wheel 7 is held from turning out of its angular position as will be presently described.

As best seen in Fig. 8, the means for limiting the turning movement of the driving and turning wheel 7 in its normal position and in its angular position comprises a pair of arms 70 and 71 arranged at a right angle to each other and projecting forwardly and laterally respectively from the axle 34 and the bearing 35, the arm 70 being arranged to engage a stop surface 72 on the side face of the frame or section 6 thereof, when the wheel is in a straight line as indicated in Fig. 8, and the arm 71 being movable into engagement with a similar surface 73 on the opposite side of the frame section 6 when the wheel 7 reaches its angular position indicated in dotted lines, Fig. 1. Suitable latches 74 and 75 which are located on a common rock shaft 76, are provided, the latch 74 holding the arm 70 in its normal position in order to hold the driving wheel

7 from turning about its upright axis when it is desired to back up the machine in a straight line or under the guidance of the steering wheel 5; and the latch 75 holding the arm 71 from movement when the wheel 7 is in its angular position and it is desired to turn the wheel in a forward direction but keep the same in its angular position as before referred to.

These latches are normally out of operative position and are brought into operative position only when needed and are operated by means of a link 77 connected to a rock arm 78, Fig. 8, on the shaft 76, the link 77 being connected to a suitable lever.

What I claim is:

1. In a traction machine, a frame, a manually controlled steering wheel at one end of the frame, a driving and corner-turning wheel at the other end of the frame and connected to the frame by an upright pivot connection, a motor supported by the frame, power-transmitting connections between the motor and the driving and turning wheel to rotate and turn the same about its upright axis, and means for controlling the operation of said connections, substantially as and for the purpose described.

2. In a traction machine, a frame, a manually controlled steering wheel, a driving and corner-turning wheel in the rear of the steering wheel, the driving and turning wheel being connected to the frame by an upright pivotal connection whereby the driving and turning wheel will operate to turn the frame, a motor supported by the frame, and power-transmitting connections between the motor and the driving and turning wheel whereby rotation of the driving wheel in a forward direction rotates the wheel to drive the machine forward and rotation of the wheel in the opposite direction turns the wheel about its upright axis into an angular position relatively to the normal line of travel of the machine, means for preventing turning of the driving wheel forwardly about its upright axis, when in its normal position and when rotating in a forward direction, and means for limiting the turning movement of the wheel about its upright axis when said driving and turning wheel reaches a predetermined angular position, substantially as and for the purpose specified.

3. In a traction machine, a frame, a manually controlled steering wheel at one end of the frame, a driving and corner-turning wheel at the other end of the frame rotatable about the axis of its axle and being connected to the frame by an upright pivotal connection to turn about an upright axis, a motor supported by the frame and connected to the driving wheel, means for controlling the operation of the driving wheel, and means for operating the steering wheel, the latter means being constructed to hold the steering wheel rigid relatively to the frame during the turning of the frame by the driving and turning wheel, substantially as and for the purpose set forth.

4. In a traction machine, a frame, a manually controlled steering wheel at one end of the frame, a driving wheel at the other end of the frame and connected thereto by an upright pivotal connection and being movable to move from its normal driving position about its upright axis into an angular position relatively to the normal line of travel of the machine for turning the frame, a motor supported by the frame and connected to the driving and turning wheel to actuate the same, and means for controlling the movement of the driving and turning wheel by the motor, substantially as and for the purpose described.

5. In a traction machine, a frame, a steering wheel at one end of the frame, a driving and corner-turning wheel in the rear of the steering wheel, the driving and turning wheel being connected to the frame by an upright pivotal connection whereby the driving and turning wheel will operate to turn the frame, a motor supported by the frame, and power-transmitting connections between the motor and the driving and turning wheel whereby rotation of the driving and turning wheel in one direction rotates the wheel to drive the machine, and whereby rotation of the wheel in the opposite direction turns the wheel about its upright axis into an angular position relatively to the normal line of travel of the machine, means for preventing turning of the driving and turning wheel forwardly about its upright axis, when in its normal position and when rotating in a forward direction, means for limiting the turning movement of the wheel about its upright axis when said driving wheel reaches a predetermined angular position, and means for operating the steering wheel, the last-mentioned means being constructed to hold the steering wheel rigid during the turning of the frame by the driving and turning wheel, substantially as and for the purpose described.

6. In a traction machine, a frame, a manually controlled steering wheel at one end of the frame, a driving and turning wheel at the other end of the frame and connected thereto by an upright pivotal connection to effect the turning of the frame, a motor supported by the frame and connected to the driving wheel to rotate and to turn the same about its upright axis, said connections comprising a train of gears for effecting the driving of the wheel in a forward direction and friction means for effecting the driving of said wheel in the reverse direction and about its upright axis, and means for controlling the operation of said connections,

substantially as and for the purpose described.

7. In a traction machine, an implement carrying frame section, a driving wheel, a motor, power transmitting means between the motor and the driving wheel, means for controlling the operation of said power transmitting means, a frame section supporting the motor and the power transmitting means, the driving wheel being connected to the latter frame section, and the tool carrying section being interchangeably mounted on the latter section, substantially as and for the purpose set forth.

8. In a traction machine, an implement carrying frame section, a driving wheel, a motor, power transmitting means between the motor and the driving wheel, means for controlling the operation of said power transmitting means, a second frame section supporting the motor and power transmitting means, the driving wheel being connected to the latter section, and the implement carrying sections being interchangeably mounted on the latter section and including a hand steering wheel, substantially as and for the purpose described.

9. In a traction machine, an implement carrying front frame section, a rear frame section, a driving wheel connected to the rear section, and a motor, power transmitting means between the motor and the driving wheel, and means for controlling the operation of the former means, supported by the rear section, the implement carrying front section having means by which it is interchangeably mounted on the rear section and having a hand steering wheel associated therewith, substantially as and for the purpose specified.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, and State of New York, this 23rd day of December, 1912.

ALEXANDER T. BROWN.

Witnesses:
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C. E. TOMLINSON.