O. P. CONGER & W. H. CORBETT.

TRACTION ENGINE.

APPLICATION FILED FEB. 23, 1910.

985,566.

Patented Feb. 28, 1911.

4 SHEETS—SHEET 1.

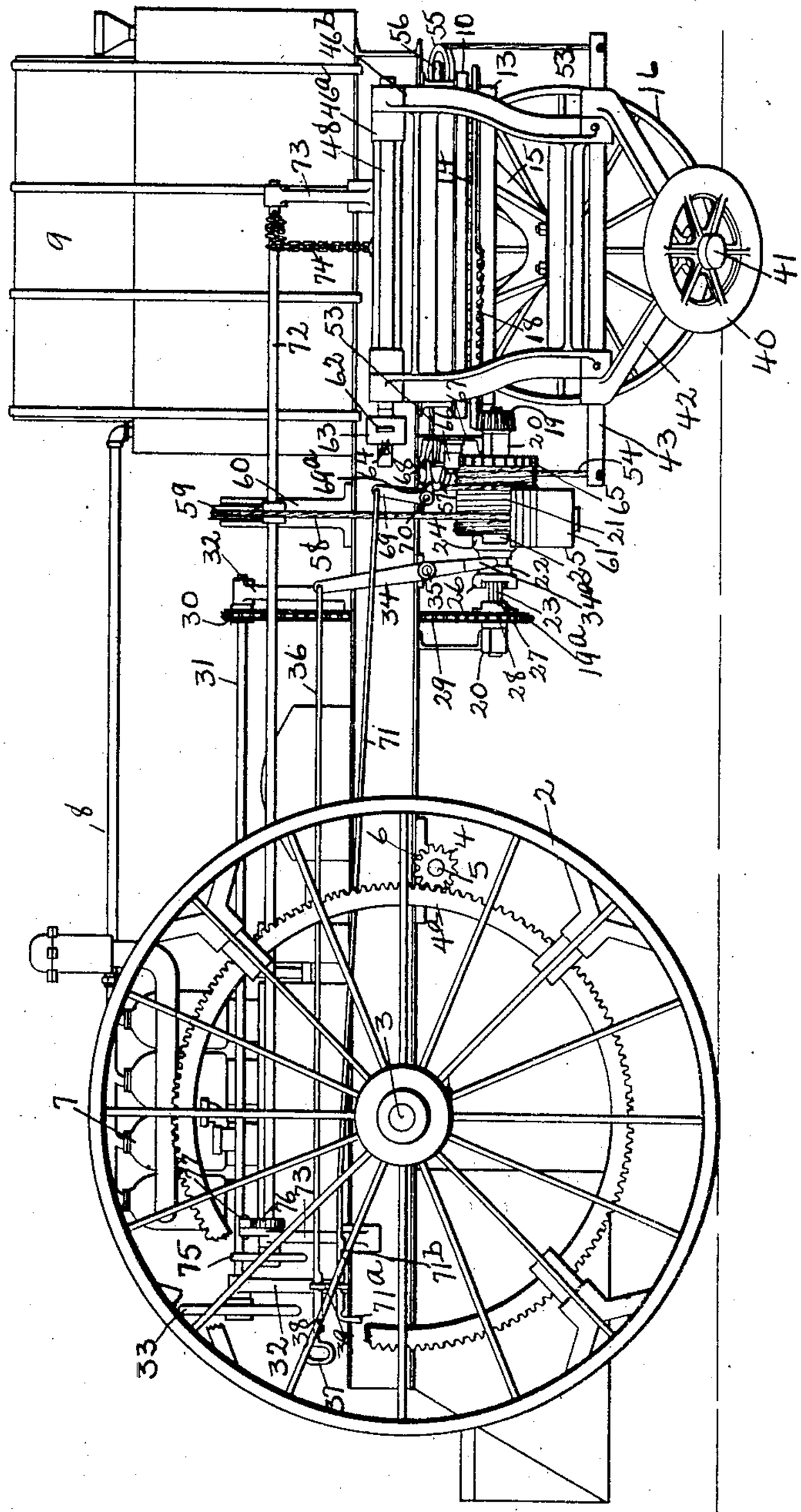

Fig. 1.

Witnesses

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4 SHEETS—SHEET 2.

Fig. 2.

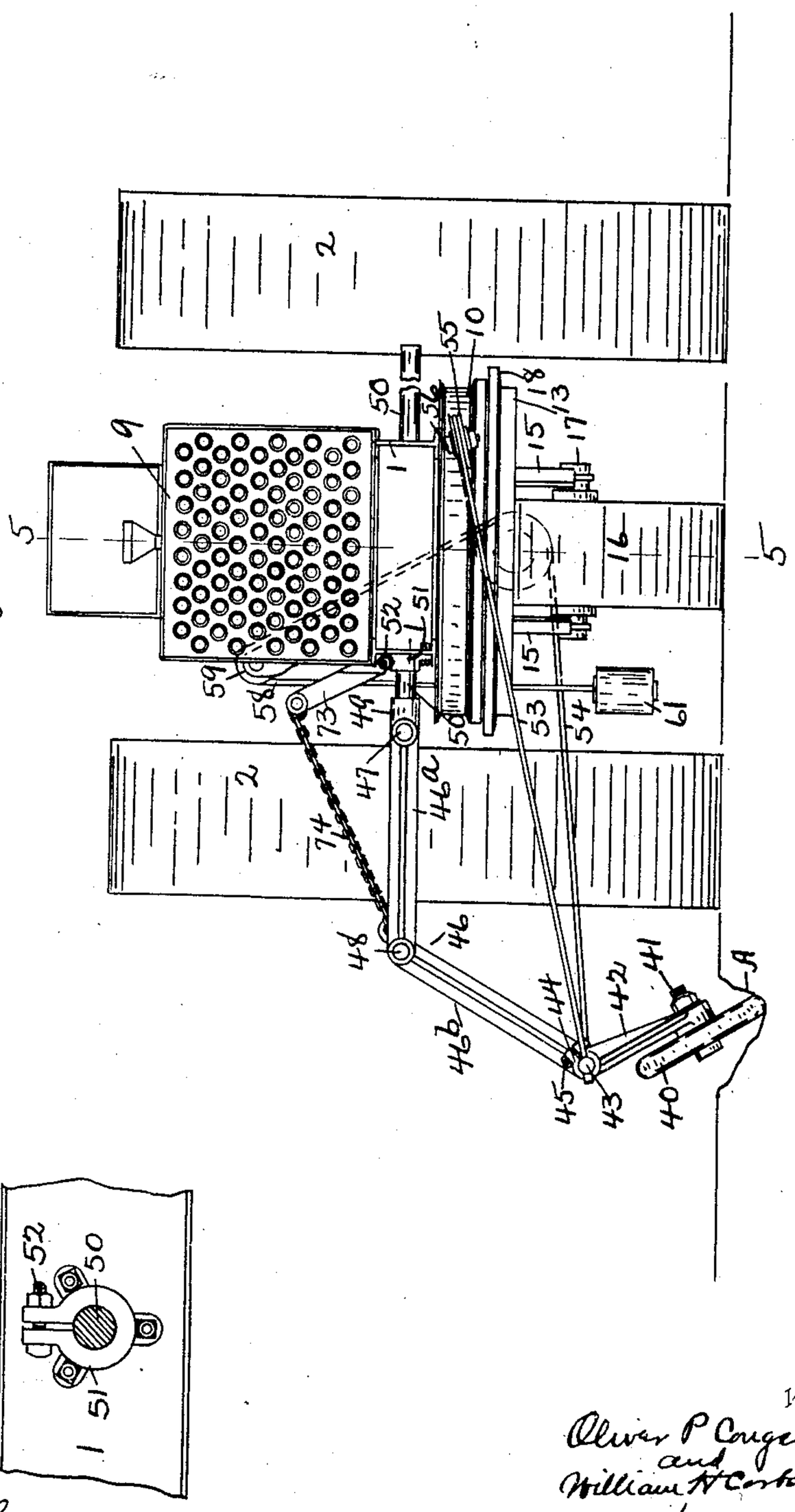

Fig. 3.

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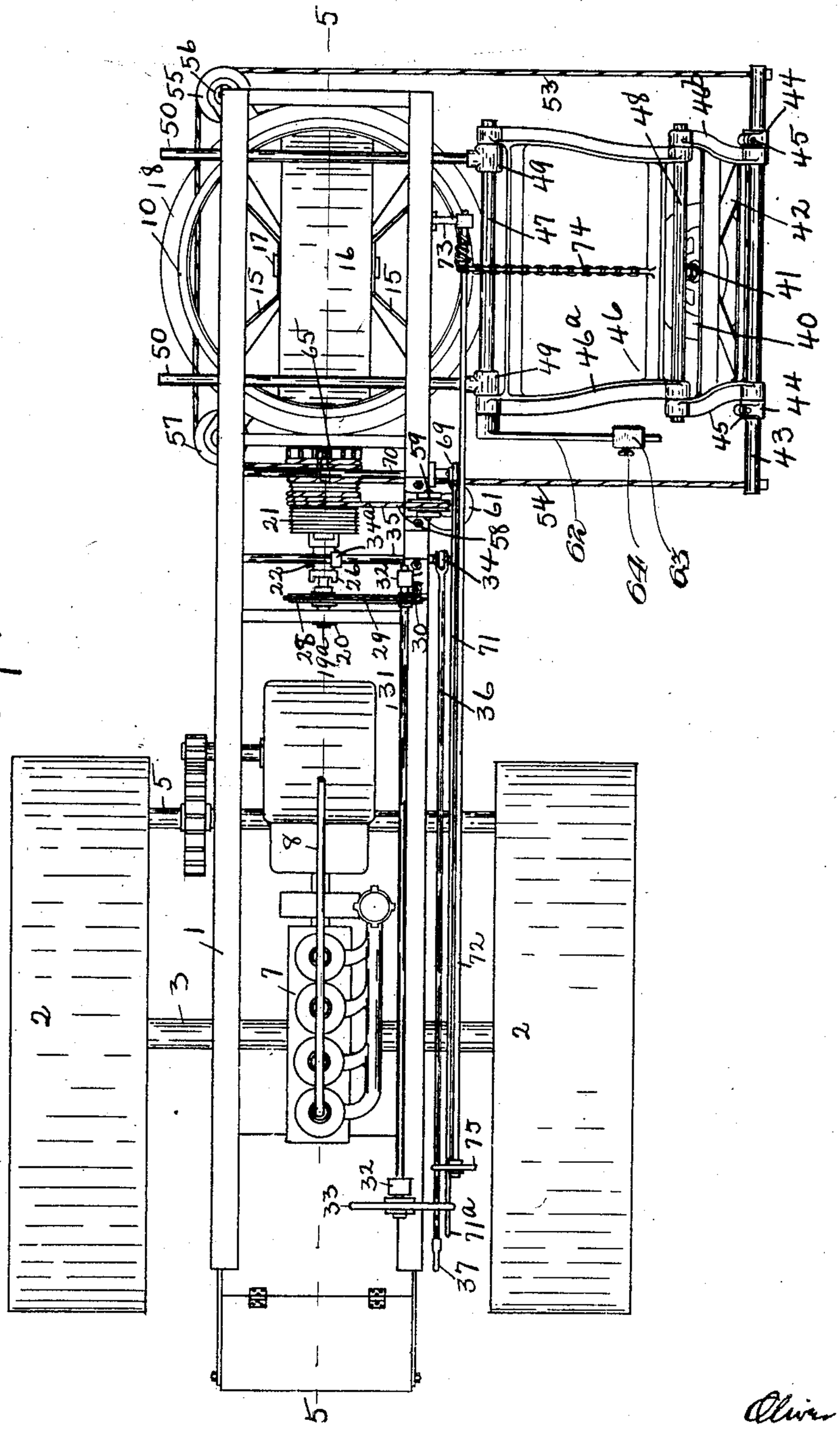
4 SHEETS—SHEET 3.

Fig 4



Witnesses

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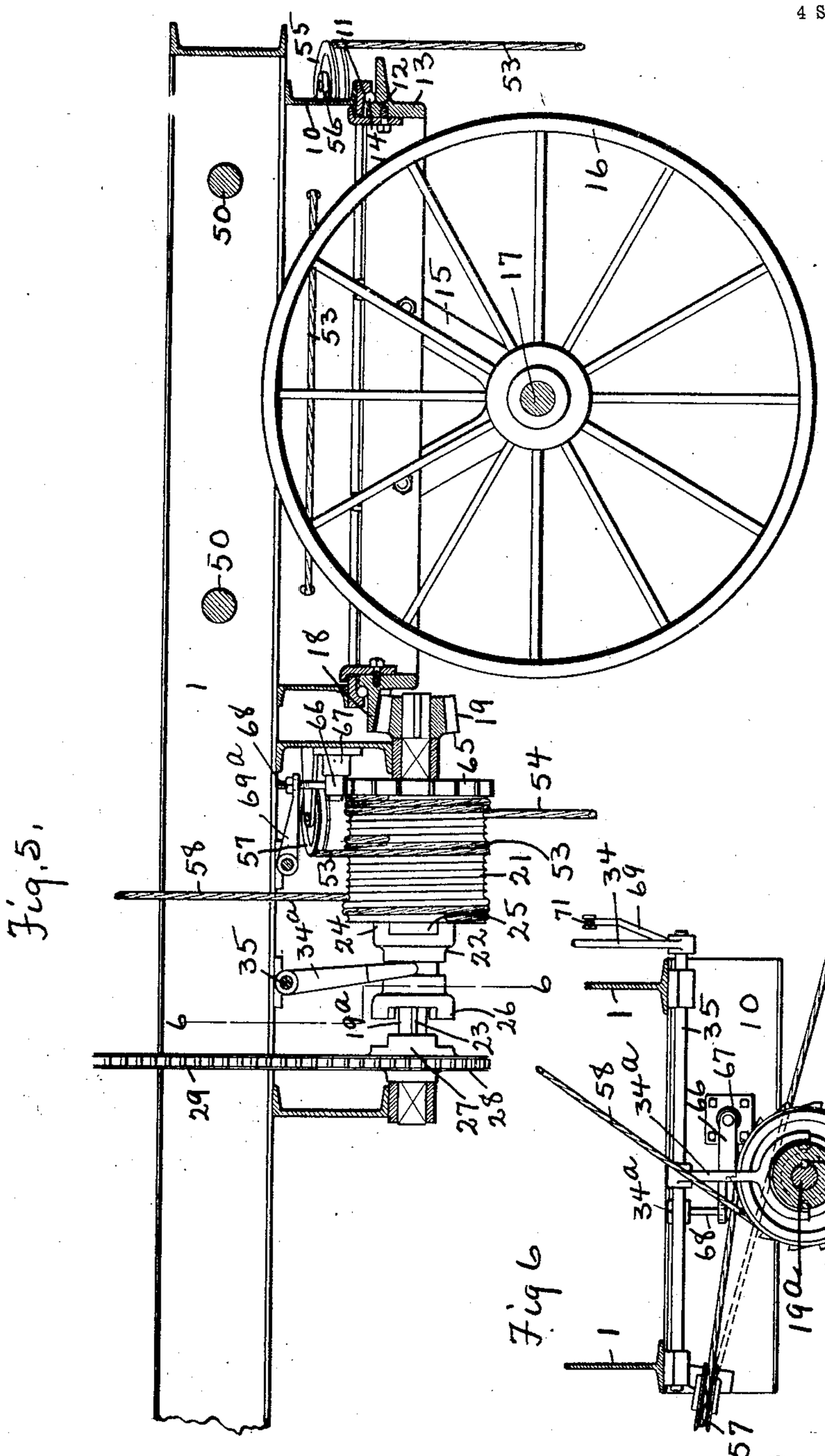
4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

OLIVER P. CONGER AND WILLIAM H. CORBETT, OF PORTLAND, OREGON.

TRACTION-ENGINE.

985,566. Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed February 23, 1910. Serial No. 545,334.

To all whom it may concern:

Be it known that we, OLIVER P. CONGER and WILLIAM H. CORBETT, citizens of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented new and useful Improvements in Traction-Engines, of which the following is a specification.

This invention relates to traction engines, and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

While some of the features are applicable to traction engines generally, one of the leading features of the invention relates to a mechanism for guiding engines of this type with relation to the walls of a preceding furrow or other guiding means, whereby the engine can be made to follow, automatically, a line of travel parallel to a guiding means ordinarily a furrow.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows a side elevation of the engine; Fig. 2 a front view of the engine; Fig. 3, an end view of the clamping ring for the pilot supporting rods; Fig. 4 a plan view of the engine; Fig. 5 a section of the steering mechanism of the engine on the line 5—5 in Figs. 2 and 4. Fig. 6 a section on the line 6—6 in Fig. 5.

1 marks the frame of the machine. This can be made in any desired manner, but preferably with the sides formed of I beams as shown. The driving wheels 2 are carried by the axle 3. They are driven by the gears 4 mounted on the shaft 5, the shaft being journaled in the bearing 6, on the frame 1. The shaft 5 is driven from the engine 7 which is preferably mounted between the driving or traction wheels. The cooling system is connected by the pipe 8 to the radiator 9 at the front of the engine. These parts form no part of our present invention.

A frame ring 10 is secured to the sides of the frame 1, near the front of the frame. A ball guide 11 is arranged on the under face of the ring. A ball guide 12 is opposed to the ball guide 11 and is carried by the wheel ring 13. Balls 14 are arranged in the race way formed by the ways 11 and 12, thus forming a ball bearing for the steering mechanism. Brackets 15 extend from the ring 13. The steering wheel 13 is mounted on the axle 17, the axle being carried by the brackets 15. As is clearly shown in the drawings, the wheel 16 extends up into the rings 13 and 10, thus permitting of a large wheel and yet a low center of gravity.

A gear 18 is formed on the ring 13. A gear 19 meshes the gear 18. The gear 19 is fixed on the shaft 19ª carried in the bearings 20—20 extending from the frame. A drum 21 is journaled on the shaft 19ª. A clutch member 22 is slidingly mounted on the shaft 19ª, but locked against rotating thereon by the spline 23. The clutch member and drum may be locked together by detents 24 and 25 on these members respectively. The clutch member also has the detents 26 for locking with the detents 27 on the sprocket wheel 28, the sprocket wheel being journaled on the shaft 19ª. The sprocket chain 29 conveys movement to the sprocket wheel 28 from the sprocket wheel 30. The sprocket wheel 30 is fixed on the shaft 31. The shaft 31 is carried by the post 32 extending upwardly from the frame; and is provided at its rear end with the operating wheel 33. When the engine is being manually steered, the clutch member 22 is thrown into engagement with the sprocket wheel 28, the drum 21 is then loose on the shaft, and the shaft 19ª can then be rotated by the operation of the hand wheel 33. The movement of the shaft 19ª is communicated through the gears 19 and 18 to the ring 13 on which the steering wheel 16 is mounted.

A shift lever 34 is mounted on the pin 35 extending from the frame. This lever actuates the clutch member 22. A rod 36 extends from the shift lever 34 and terminates with a handle 37, at the rear of the machine. It is provided with the notches 38 which can be dropped over the plate 39 to lock the rod 36, and consequently the shift lever and clutch lever in either position desired.

A pilot 40 which is shown as in the form of a wheel, is journaled on the stud 41. The stud 41 is carried by the bracket 42. The bracket 42 is adjustably mounted on the shaft 43, the bracket 42 terminating in the split rings 44 with clamping bolts 45 for this purpose. We prefer to tilt the pilot wheel as shown, so that it will engage the bottom of the wall of the furrow, and still clear the wall except at the periphery of the

wheel. In Fig. 2 we represent the wall of the furrow as "*a*."

The shaft 43 is mounted on the swinging support 46. This swinging support is carried by a shaft 47. It has an intermediate joint 48, thus forming an upper or approximately horizontal arm 46^a, and a lower or approximately vertical arm 46^b. The lower arm 46^b swinging on the shaft 48 permits of the lateral movement of the pilot, while the swinging of the upper arm 46^a on the shaft 47 permits of its vertical movement. The shaft 47 is mounted in the bracket 49 and the bracket 49 is mounted on the rods 50. The rods 50 extend through the frame of the machine, and may be adjusted and locked laterally by the ring 51 which is provided with the clamping bolts 52. In this way the pilot may be offset with relation to the engine in any distance desired.

A cable 53 extends from the front end of the shaft 43 and the cable 54 from the rear end. The cable 53 is led over an idler 55 journaled on the bearing 56 on the frame, and an idler 57 also journaled on the frame to the drum 21. The cable 54 extends directly from the shaft to the drum. Both of these cables lead onto the drum so that both tend to turn the drum in the same direction with the same movement of the pilot. A cable 58 is also secured to the drum. It is led over a wheel 59 journaled on the post 60 extending upwardly from the frame and is supplied with a weight 61. The cable 58 through the influence of the weight, operates upon the drum to wind up the cables 53 and 54. In this way the weight exerts pressure on the pilot so as to maintain it in contact with the wall of the furrow.

When the machine is set for automatic operation, the clutch member 22 is thrown into engagement with the drum. When there is any deflection in the line of the furrow, or when there is a tendency for the machine to depart from a position in the line of the furrow which would increase the distance between the furrow and the line of the machine, the pilot following the furrow, swings the pilot support outwardly, carrying with it the cables 53 and 54, and thus rotating the drum so as to swing the steering wheel toward the furrow. The steering wheel will then be held in such relation to the frame as to maintain the engine in a position parallel or at the desired distance or offset from the furrow. On the other hand, should the furrow deflect toward the engine, or the engine, for any cause, be deflected toward the furrow, the weight operating upon the cable and the drum, being relieved by the decrease in distance between the engine and the pilot, immediately rotates the drum in the opposite direction so as to swing the steering wheel away from the furrow, and thus maintains it in a position to keep the engine in parallel or at a predetermined distance from the furrow, the deflection or swing of the steering wheel being proportioned to the deflection in the furrow or the distance the engine is over the neutral or predetermined line of travel.

It will be observed that with this construction, the traction of the pilot in no way influences the steering mechanism. In devices heretofore made, of this type, this has been a serious drawback in the use of pilot wheels inasmuch as this traction becomes more effective as the offset increases. With the present invention, the pilot wheel may be offset indefinitely without in any way effecting its efficiency in actuating the steering mechanism. It will also be noted that by mounting the pilot wheel with the swinging support it can be readily made to follow any unevenness in the furrow relatively to the plane of the ground occupied by the engine. In other words, there is a free vertical movement of the pilot, and also a free lateral movement, and the axes of the joints being lengthwise of the frame, there is no tendency for the traction to influence the action of the pilot. It will also be noted that with this construction where the pilot is mounted on the frame as distinguished from the steering member, the pilot may be placed anywhere with relation to the length of the frame without in any way effecting its efficiency. We prefer to place the pilot wheel abreast of the frame, and opposite the steering member. In this way the position of the steering member may be maintained, at a predetermined distance from the guiding means or furrow, whereas in devices in which considerable distance intervenes between the pilot and the engine, there is, of course, more or less deviation between the line of travel of the engine and the guiding means. Furthermore, the coupling up of the guiding means abreast of the engine permits of the engine being carried up closer to the ends of fields or in relation to obstructions and in this way, adds very materially to its efficiency. By varying the relative proportions of the drum and actuating gears, any leverage or any turning movement can be given to the steering member relative to a given movement of the pilot desired.

With certain kinds of ground it is desirable to vary the weight on the pilot. We accomplish this by providing an arm 62 on the shaft 47, the arm 46^a being fixed on this shaft. A weight 63 is adjustably secured on the arm 62 by set screws 64. In this way the weight on the pilot may be adjusted as desired.

Where it is not desired to use the automatic steering, it is desirable to lift the pilot, and when this is done, it is desirable

to lock the weight so that the pilot can be dropped into position without lifting the weight. The drum is provided with the notched end 65. A pawl 66 is carried by the bracket 67 on the frame, adapted to be moved into and out of engagement with the notched end of the drum to lock the drum against rotation, thus maintaining the weight. A bolt 68 extends from the pawl 66 to a bell crank lever 69. The bell crank lever is carried on the pin 70, extending from the frame. A rod 71 extends from the bell crank 69 to the rear of the machine, terminating in a handle 71ª by means of which the pawl 66 may be turned into or out of engagement. A shaft 72 is journaled in the post 73 extending upwardly from the frame. A chain 74 extends from the outer end of the arm 46ª to the shaft 72. A hand wheel 75 is also fixed to the shaft. A pawl 77 is pivoted on the post 73 to drop onto the ratchet wheel 76 so as to lock the shaft 72 and consequently the swinging support in its upper position.

By mounting the pilot on the frame a very sensitive control of the steering mechanism may be accomplished, and while we have shown one construction of accomplishing the movement of the steering mechanism with a movement of the pilot, we do not wish to be understood in the broader phases of our invention, to be limited to this particular construction or to one in which the energy for affecting the steering mechanism is dependent directly upon the pressure upon the pilot.

By interposing a pivoted oscillating member in the connection between the pilot and the steering member the movement of the steering member with a given movement of the pilot, may, in a small space, be made to suit any condition. For instance, if the engine be very heavy, and intended for use with comparatively straight furrows or guiding means, the interposed oscillating member may be proportioned to give but little movement to the steering member with a considerable movement of the pilot, thus increasing the power of the pilot at the expense of a rapid response in the steering mechanism. On the other hand, if the character of the soil will stand heavy pressure on the wall of the furrow, and the ground is such as to require rather sharp turns, the pivoted oscillating member or members can be so proportioned as to give considerable movement to the steering member with but little movement of the pilot.

What we claim as new is:

1. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; devices communicating a movement of the pilot to the steering member; and a mounting for the pilot movable laterally under the influence of lateral pressure on the pilot, said mounting sustaining the traction of the pilot by driving pressure on the pilot in a direction constant to a longitudinal line of the mounting and the engine.

2. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot mounted on the frame and offset from said member; devices communicating a movement of the pilot to the steering member; and a mounting for the pilot movable laterally under the influence of lateral pressure on the pilot, said mounting sustaining the traction of the pilot by driving pressure on the pilot in a direction constant to a longitudinal line of the mounting and the engine.

3. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support carried by the frame for the pilot having its axis lengthwise of the frame; and devices communicating a movement of the pilot to the steering member.

4. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support for said pilot, said support having an intermediate joint, the axes of the support and the intermediate joint being lengthwise of the frame whereby the pilot may move laterally relatively to the frame, and vertically; and devices communicating a movement of the pilot to the steering member.

5. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot wheel offset from said member; devices communicating a movement of the pilot wheel to the steering member; and a mounting for the pilot movable laterally under the influence of lateral pressure on the pilot, said mounting sustaining the traction of the pilot by driving pressure on the pilot in a direction constant to a longitudinal line of the mounting and the engine; and means adjusting the angle of the axis of the pilot wheel relatively to the frame.

6. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot wheel offset from said member; a swinging support for the pilot wheel having its axis lengthwise of the frame; and means for adjusting the angle of the axis of the pilot wheel relatively to the frame.

7. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable relatively thereto to steer the engine; a pilot; a swinging support for the pilot mounted on the frame, said support having an intermediate joint, the axes of said joint and support being lengthwise of the frame; and devices connecting the steering member with the support adjacent to the pilot for communicating a movement of the pilot to the steering member.

8. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable relatively thereto to steer the engine; a pilot; a swinging support for the pilot mounted on the frame, said support having an intermediate joint, the axes of said joint and support being lengthwise of the frame; and devices connecting the steering member with the support adjacent to the pilot for communicating a movement of the pilot to the steering member, said devices comprising a cable.

9. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support carried by the frame for the pilot having its axis lengthwise of the frame; devices communicating a movement of the pilot to the steering member; and means for lifting the swinging support to clear the pilot.

10. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support for said pilot, said support having an intermediate joint, the axes of the joint and the support being lengthwise of the frame whereby the pilot may move laterally relatively to the frame; and vertically; and devices communicating a movement of the pilot to the steering member; and means for lifting the swinging support to lift the pilot out of operative position.

11. In a traction engine the combination of a frame; a steering member pivotally mounted thereon; a gear on the steering member having the pivot of the steering member for its center; a pilot; and devices for communicating the movement and energy of the pilot to the gear for actuating the steering member whereby the steering member is directly operated by the movements of the pilot.

12. In a traction engine the combination of a frame; a steering member pivotally mounted thereon; a gear on the steering member having the pivot of the steering member for its center; a pilot; and devices for communicating the movement of the pilot to the gear, comprising a drum and a cable extending from the drum to the pilot whereby the steering member is directly operated by the movement of the pilot.

13. In a traction engine the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support carried by the frame for the pilot having its axis lengthwise of the frame; devices communicating movement of the pilot to the steering member; and means for adjusting the swinging support laterally to vary the offset of the pilot.

14. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support for said pilot, said support having an intermediate joint, the axes of the support and the intermediate joint being lengthwise of the frame whereby the pilot may move laterally relatively to the frame and vertically; devices communicating a movement of the pilot to the steering member; and means for adjusting said support to vary the offset of the pilot.

15. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support for said pilot, said support having an intermediate joint; the axes of the support and the intermediate joint being lengthwise of the frame whereby the pilot may move laterally relatively to the frame, and vertically; and devices communicating a movement of the pilot to the steering member; an auxiliary member for said support; and means for adjusting said auxiliary frame laterally to vary the offset of the pilot.

16. In a traction engine the combination of a frame; a steering member mounted thereon and movable relatively thereto to steer the engine; a pilot adapted to engage the wall of a furrow; devices communicating the movement of the pilot relatively to the engine to the steering mechanism; and means independent of the pilot for exerting a yielding and following continuous pressure on the pilot to maintain it in contact with the wall of the furrow.

17. In a traction engine the combination of a frame; a steering member mounted on the frame and movable relatively thereto to steer the engine; a pilot adapted to engage the wall of the furrow; devices communicating one deflection in the line of movement of the pilot relatively to the engine to the steering member; mechanism independent of the pilot for exerting a yielding and following continuous pressure on the pilot to maintain it in contact with the wall of the furrow and to actuate the steering

member with an opposite deflection in the line of movement of the furrow relatively to the engine.

18. In a traction engine the combination of a frame; a steering member mounted on the frame, and movable with relation to the frame to steer the engine; a pilot mounted on the frame and free to move vertically and laterally relatively to the frame and adapted to engage a wall of a furrow; devices communicating a deflection in the line of movement of the pilot relatively to the frame to the steering mechanism; a mounting for the pilot movable laterally under the influence of lateral pressure on the pilot, said mounting sustaining the traction of the pilot by driving pressure on the pilot in a direction constant to a longitudinal line of the mounting and the engine; and mechanism for exerting a yielding and following continuous pressure on the pilot to maintain it in contact with the wall of the furrow.

19. In a traction engine the combination of a frame; a steering member mounted on the frame, and movable with relation to the frame to steer the engine; a pilot mounted on the frame and free to move vertically and laterally relatively to the frame and adapted to engage a wall of a furrow; devices communicating one deflection in the line of movement of the pilot relatively to the frame to the steering mechanism; a mounting for the pilot movable laterally under the influence of lateral pressure on the pilot, said mounting sustaining the traction of the pilot by driving pressure on the pilot in a direction constant to a longitudinal line of the mounting and the engine; and mechanism for exerting a yielding and following continuous pressure on the pilot to maintain it in contact with the wall of the furrow, and to actuate the steering mechanism with an opposite deflection of the line of movement of the pilot relatively to the engine.

20. In a traction engine the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member and adapted to engage the wall of a furrow; a swinging support carried by the frame for the pilot and having its axis lengthwise of the frame; devices communicating a deflection in the line of movement of the pilot relatively to the frame to the steering mechanism; and mechanism for exerting pressure on the pilot to maintain it in contact with the wall of the furrow.

21. In a traction engine the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member and adapted to engage the wall of a furrow; a swinging support carried by the frame for the pilot having its axis lengthwise of the frame; devices communicating a deflection in the line of movement of the pilot relatively to the frame to the steering mechanism; and mechanism independent of the pilot for exerting pressure on the pilot to maintain it in contact with the wall of the furrow.

22. In a traction engine the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member and adapted to engage the wall of a furrow; a swinging support carried by the frame for the pilot having its axis lengthwise of the frame; devices communicating one deflection in the line of movement of the pilot relatively to the frame to the steering mechanism; and mechanism independent of the pilot for exerting a yielding and following pressure on the pilot to maintain it in contact with the wall of the furrow, and to actuate the steering member with an opposite deflection in the line of movement of the pilot relatively to the engine.

23. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member and adapted to engage a wall of a furrow; a swinging support for said pilot, said support having an intermediate joint, the axes of the support and the intermediate joint being lengthwise of the frame whereby the pilot may move laterally relatively to the frame and vertically; devices communicating a deflection in the line of movement of the pilot relatively to the frame to the steering member; and mechanism exerting pressure on the pilot to maintain it in contact with the wall of the furrow.

24. In a traction engine the combination of a frame; a steering member mounted on the frame and movable relatively thereto for steering the engine; a pilot adapted to engage the wall of the furrow; a swinging support for the pilot; a means for lifting the swinging support; devices communicating one deflection in the line of movement of the pilot relatively to the engine to the steering member; and a mechanism carried by the engine for exerting pressure on the pilot to maintain it in contact with the wall of the furrow, and to actuate the steering member with an opposite deflection in the line of movement of the pilot relatively to the engine; and means for locking out the mechanism.

25. In a traction engine, the combination of a frame; a steering member mounted on the frame, and movable relatively thereto for steering the engine; a pilot adapted to engage the wall of the furrow; devices com-

munication a deflection in the line of movement of the pilot relatively to the engine to the steering member; and a mechanism carried by the engine for exerting pressure on the pilot to maintain it in contact with the wall of the furrow; and to actuate the steering member with an opposite deflection in the line of movement of the pilot relatively to the engine; and means for locking out the mechanism and for lifting the pilot.

26. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member and adapted to engage the wall of a furrow; a swinging support for said pilot, said support having an intermediate joint, the axes of the support and the intermediate joint being lengthwise of the frame whereby the pilot may move laterally relatively to the frame and vertically; devices communicating a deflection in the line of movement of the pilot relatively to the frame to the steering member; and mechanism exerting pressure on the pilot to maintain it in contact with the wall of the furrow, and to actuate the steering member with an opposite deflection in the line of movement of the pilot relatively to the engine; and means for locking out said mechanism and for lifting the swinging support.

27. In a traction engine the combination of a frame; a steering member mounted thereon and movable with relation to the frame to steer the engine; a drum for actuating the steering member; a pilot adapted to engage the wall of the furrow; devices leading from the pilot to the drum; and a pressure device operating upon the drum to exert pressure on the pilot and to actuate the steering mechanism in one direction.

28. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot abreast of the steering member; and a connection between the pilot and the steering member for communicating a movement and energy of the pilot wheel to the steering member comprising an intermediate rotative member.

29. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot abreast of the steering member; and a connection between the pilot and the steering member for communicating a movement and energy of the pilot wheel to the steering member comprising an intermediate rotative member controlling the proportion of movement of the steering member relatively to a given movement of the pilot.

30. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the engine to steer the engine; a pilot offset from said member; devices controlled by the pilot for actuating the steering member; and a mounting for the pilot movable laterally under the influence of lateral pressure on the pilot, said mounting sustaining the traction of the pilot by driving pressure on the pilot in a direction constant to a longitudinal line of the mounting and the engine.

31. In a traction engine, the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support for the pilot having its axis lengthwise of the frame; and devices controlled by the pilot for actuating the steering member.

32. In a traction engine the combination of a frame; a steering member mounted on the frame and movable with relation to the frame to steer the engine; a pilot offset from said member; a swinging support for said pilot, said support having an intermediate joint, the axes of the support and the intermediate joint being lengthwise of the frame whereby the pilot may move laterally relatively to the frame and vertically; and devices controlled by the pilot for actuating the steering member.

33. In a traction engine, the combination of a frame; a steering member mounted thereon and movable relatively thereto to steer the engine; a pilot adapted to engage the wall of the furrow; devices controlled by the pilot for actuating the steering member and means acting independently of the pilot in all lateral adjustments of the pilot for exerting continuous pressure upon the pilot to maintain it in contact with the wall of the furrow.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

OLIVER P. CONGER.
WILLIAM H. CORBETT.

Witnesses as to the signature of Oliver P. Conger:

CHARLES G. BREVILLIER,
H. C. LORD.

Witnesses as to the signature of William H. Corbett:

M. H. INSLEY,
ELIJAH CORBETT.