No. 832,028. PATENTED OCT. 2, 1906.

D. B. ARNOLD.

TRACTION ENGINE.

APPLICATION FILED AUG. 17, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

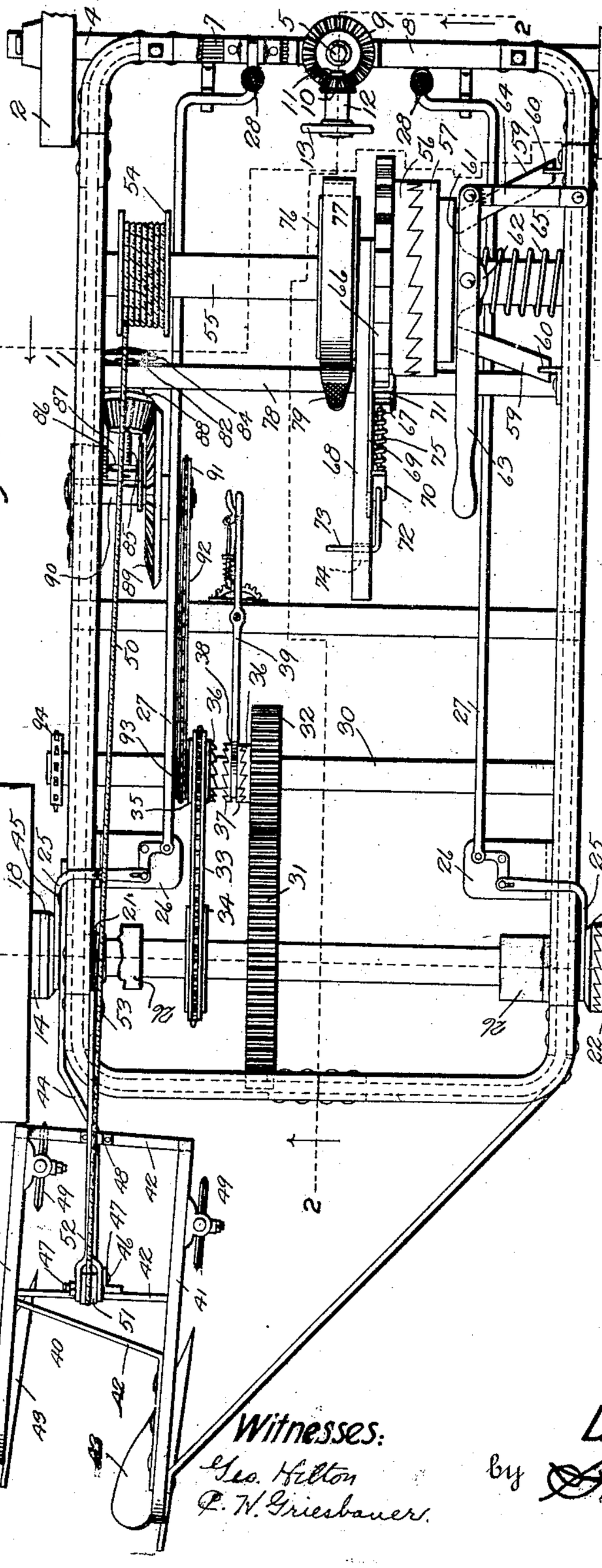
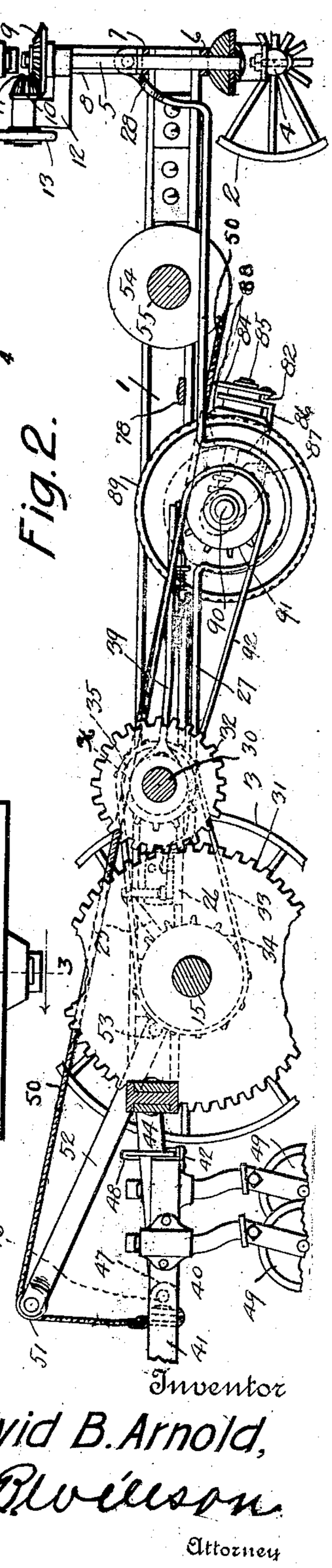


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

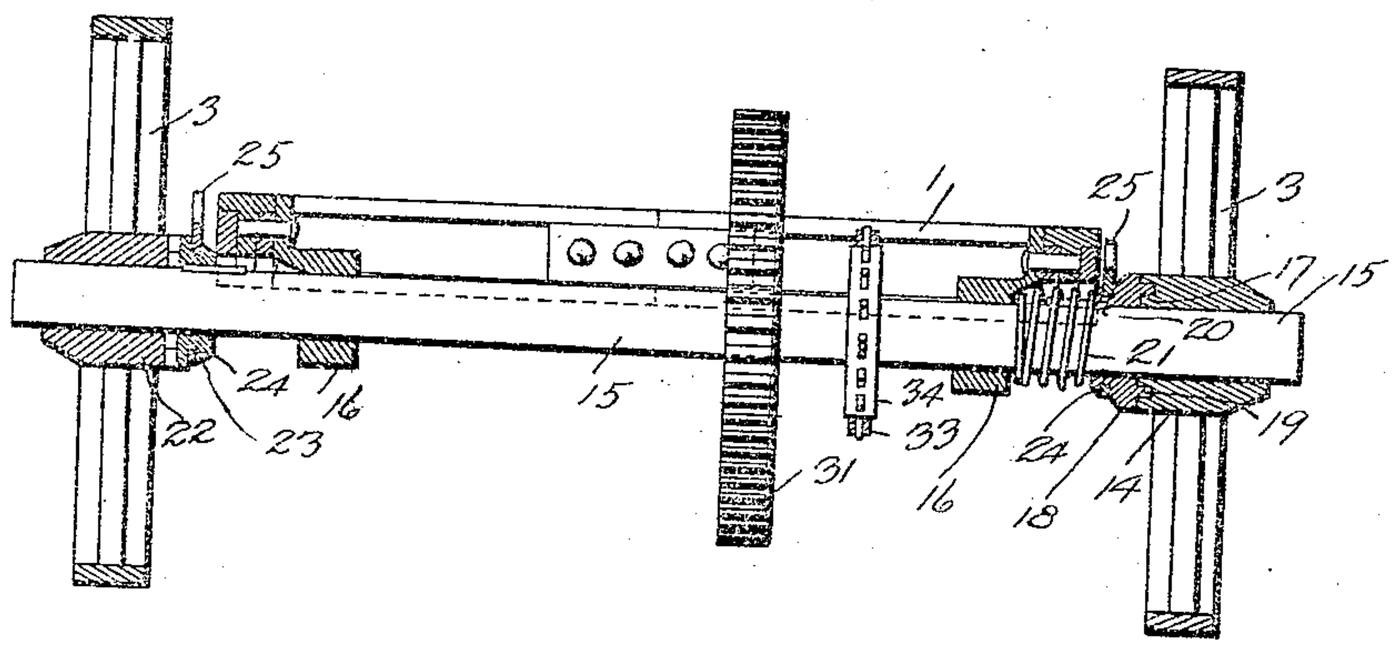
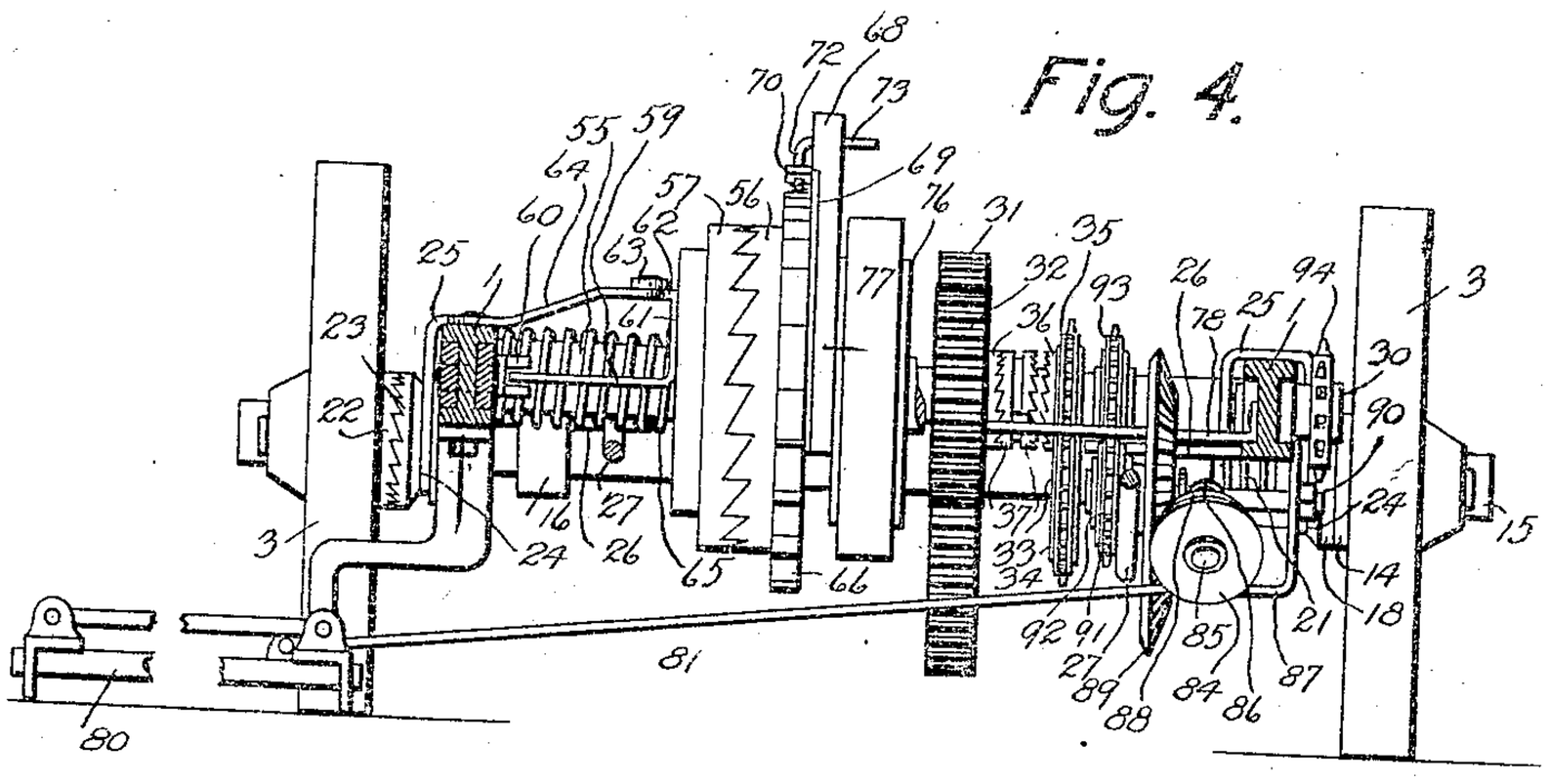



Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 5.

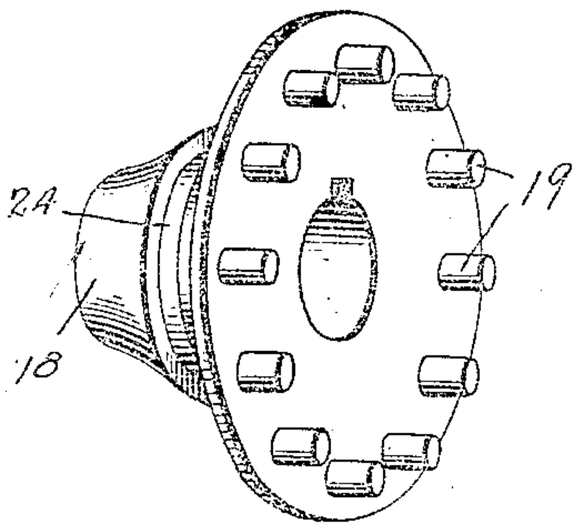



Fig. 6.

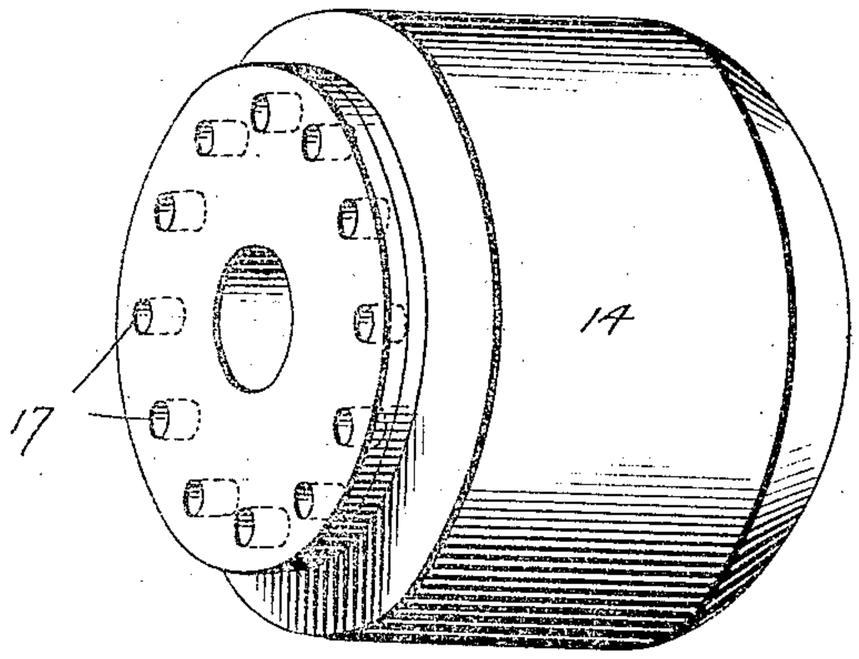



Fig. 7.

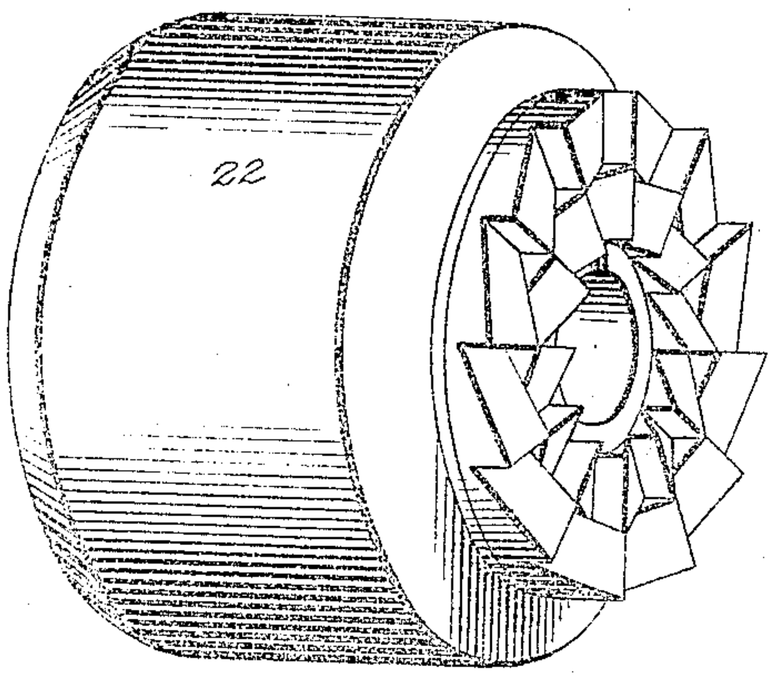
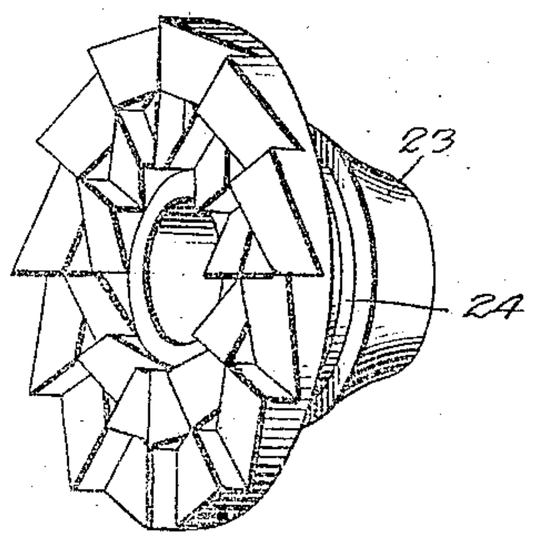



Fig. 8.

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# UNITED STATES PATENT OFFICE.

DAVID B. ARNOLD, OF TERRE HAUTE, INDIANA.

## TRACTION-ENGINE.

No. 832,028. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed August 17, 1905. Serial No. 274,593.

*To all whom it may concern:*

Be it known that I, DAVID B. ARNOLD, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Traction-Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in traction-engines; and it consists in the novel construction, combination, and arrangement of devices hereinafter described and claimed.

One object of the invention is to provide a simple, durable, and efficient machine of this character to which different agricultural implements may be applied, so that it may be adapted for various uses.

Another object of the invention is to provide a simple and efficient means for raising and lowering a plow or similar implement attached to the engine.

Another object of the invention is to provide means upon a traction-engine whereby a mowing-machine may be driven and also means whereby an elevator or other parts of a reaping-machine may be driven.

A further object of the invention is to improve and simplify the construction and operation of machines of this character, and thereby render the same more efficient and durable in use and less expensive to manufacture.

The above and other objects of the invention are attained by means of the construction illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of my improved traction-engine, showing a plow mounted thereon. Fig. 2 is a vertical longitudinal sectional view through the same, taken on the plane indicated by the line 2 2 in Fig. 1. Fig. 3 is a vertical transverse sectional view taken on the plane indicated by the line 3 3 in Fig. 1. Fig. 4 is a similar sectional view taken on the plane indicated by the line 4 4 in Fig. 1 and showing the gearing for operating the cutter-bar of a mowing-machine. Figs. 5 and 6 are perspective views of the coacting members of the clutch device upon one of the drive-wheels, and Figs. 7 and 8 are similar views of the coacting members of the clutch device upon the other drive-wheel.

Referring to the drawings by numeral, 1 denotes the body or main frame of the traction-engine, which may be of any form or construction, but, as shown, is of substantially rectangular form and composed of channel metal beams. Said frame is supported at its front upon steering-wheels 2 and at its rear upon drive-wheels 3. The steering-wheels 2 are suitably journaled upon spindles provided at the ends of a front axle 4, which is pivotally mounted at its center beneath the front end of the frame 1, as clearly shown in Fig. 2 of the drawings. The king-bolt or pivot-shaft 5 of the axle 4 extends vertically through suitable bearings 6 7, provided upon the frame 1, and in an angular brace 8, as seen in Fig. 3 of the drawings. Upon the upper end of the shaft 5 is secured a bevel-gear 9, which meshes with a pinion 10, secured upon a rearwardly-extending shaft 11, which is mounted in bearings 12, provided upon the brace 8. A hand-wheel 13 is secured upon the end of the last-mentioned shaft for the purpose of steering the machine. It will be seen that when this wheel is rotated the axles 4 may be swung in either direction, as desired.

The drive-wheels 3 have their hubs loosely mounted upon the ends of the rear axle 15, which is journaled in suitable bearings 16, secured adjacent to the rear of the frame 1. Each of the wheels 3 is adapted to be locked to the shaft 5, so as to rotate therewith, by a suitable clutch device. In Figs. 5 to 8, inclusive, of the drawings I have shown two different forms of such clutch devices, and in Fig. 3 of the drawings I have shown one of them applied to one of the drive-wheels and the other applied to the other of said wheels. The clutch devices shown in Figs. 5 and 6 and upon the left-hand drive-wheel in Figs. 1 and 3 consists in forming in the hub 14 of the wheel 3 an annular series of openings or sockets 17, so as to permit the said hub to serve as one member of the clutch. The other member 18 is slidably mounted upon the rear axle and has an annular enlargement or flange at one end, from which projects an annular series of studs 19, which are adapted to enter the sockets or recesses 17, formed in the hub 14, so as to lock said members together. The member 18, while free to slide longitudinally upon the shaft, so as to permit the studs 19 to be moved into and out of the sockets 17, is keyed to rotate with the shaft 15, as shown at 20, and the member 18 is forced toward the other member of the clutch, and thereby held normally in its

locked position by means of a coiled spring 21, which surrounds the axles and is confined between said members 18 and an annular collar formed or secured upon the axle.

The clutch device shown in Figs. 7 and 8 of the drawings is similar in construction to the one just described. Instead of providing a stud-and-socket locking connection between the two members of the clutch the members 22 23 in this form are similar and each consists of an inner and an outer annular row of ratchet-teeth, the teeth of each row being inclined in opposite directions and the teeth of the corresponding rows in the two members being also inclined in opposite directions, as clearly shown in Figs. 7 and 8.

The members 18 and 23 of the two clutch devices are each formed with annular grooves 24 to receive the forked or bifurcated arms of the bell-crank levers 25, which are pivoted in brackets 26 provided upon the frame 1. The bell-crank levers 25 have their other arms connected by links or rods 27 to operating-levers 28, mounted at the front of the frame 1 within convenient reach of the operator.

The axle 15 is driven from the counter-shaft 30, which is mounted in suitable bearings upon the frame 1 and may be connected up in any desired manner with any suitable form of engine or motor mounted on the frame 1. In order to drive the axle in one direction, I secure upon it a gear 31, which meshes with a pinion 32, loosely mounted upon the counter-shaft 30, and in order to drive it in the reverse direction I provide a sprocket-chain 33, which is passed about a sprocket-wheel 34, secured upon the axle 15, and about a sprocket-pinion 35, loosely mounted upon the counter-shaft 30. The opposing faces of the pinion 32 and sprocket 35 are provided with clutch members 36, either of which is adapted to be engaged by coacting clutch members 37, provided upon a sliding hub 38, which is mounted upon the counter-shaft 30. This clutch-hub 38 is formed with an angular groove to receive the bifurcated end of an operating-lever 39, by means of which the clutch-hub 38 may be shifted to connect or disconnect either the direct or the reverse driving-gear just described.

In Figs. 1 and 2 of the drawings I have shown a plow 40 mounted upon the rear of the frame 1. As shown, this plow consists of two parallel beams 41, which are connected together and spaced apart by cross-bars 42, upon the lower end of each of which is a plowshare 43. This plow is adjustably mounted by pivoting it upon the rear end of a swinging beam 44, which has its opposite end pivotally mounted upon one side of the frame 1, as shown at 45. The pivotal connection of the plow to the beam is preferably effected by passing a pivot-bolt 46 through alining openings formed in the said beam and in brackets 47, provided upon one of the cross-bars 42. The swinging movement of the plow upon the beam 44 is limited by a substantially U-shaped guide 48, secured upon the front cross-bar 42 and surrounding the beam 44. Upon the beams 41 are adjustably mounted rotary disk colters 49, which are disposed in front of the plowshares and are preferably of the usual form and construction.

In order to raise and lower the plow and hold it in an adjusted position, I provide a flexible cable 50 and connect one of its ends to the rear cross-bar 42 of the plow and its other end to a winding device mounted in the frame 1 at its front end. The cable or similar flexible connection 50 passes over a guide-pulley 51 in the forked end of a brace 52, which is pivotally mounted, as shown at 53, upon the frame 1, so that it may be swung inwardly and out of the way when the plow is disconnected from the machine. The forward end of the cable 50 is secured to and wound upon a drum 54, which is secured upon the shaft 55 of said winding device. This shaft 55 is journaled in suitable bearings provided upon the frame 1 and has fixed thereto one member 56 of a clutch device, the other member 57 of which is adapted to slide longitudinally upon said shaft 55, but is prevented from rotating therewith by the engagement of longitudinally-extending arms 59 with slotted guide-brackets 60. As shown, these arms 59 are formed integral with a plate 61, which is secured upon the outer face of the clutch member 57 and has at its top a projecting lug or arm 62, to which is pivoted an operating-lever 63. The latter has one of its ends formed with a handle and its other end pivoted upon a bracket 64, which is secured to the frame 1. This lever 63 is provided for the purpose of shifting the clutch member 57 longitudinally upon the shaft 55 to disengage it from the other member 56, with which it is held normally engaged by means of a coil-spring 65. Said spring surrounds the shaft 55 and is confined between the member 57 and one of the bearings of said shaft. Upon the member 56 of the clutch device is formed or secured a ratchet-wheel 66, which coacts with a pawl 67, provided upon a hand-lever 68. The lever 68 is loosely mounted upon the shaft 55, and the pawl 67 is slidably mounted in a suitable plate 69, which is secured upon said lever. This plate has guide-lugs 70 bent upwardly from its central portion, said lower lug 71 being apertured to receive the pawl 67 and having a portion bent inwardly to engage the outer face of the ratchet 66, and thereby hold the lever 68 adjacent to said ratchet, and said lug 70 being apertured to receive an operating stem or rod 72, which is attached to the pawl 67 and has its upper end 73 bent at right angles and projecting through a slot 74,

formed in the lever 68. The pawl 67 is forced into engagement with the ratchet 66 by a spring 75, which surrounds the lower portion of the rod 72 between said pawl and the lug 70. It will be seen that by pulling or pressing upwardly upon the end 73 of said rod the pawl may be disengaged from the ratchet 66 to permit the lever to be rotated without actuating the clutch member 56, and hence the shaft 55. In order to control the rotation of the shaft 55, particularly when the cable 50 is unwound from the drum 54 to lower the plow, I provide upon the shaft 55 a brake wheel or hub 76, which is surrounded and engaged by a friction brake-band 77. This band is preferably formed of resilient metal and has one of its ends secured upon the cross-bar 78 upon the frame 1 and its opposite end bent to form a foot-piece 79, by means of which it may be readily tightened upon the periphery of the friction-wheel 76, as clearly shown in Fig. 2 of the drawings. In elevating the plow it will be seen that the ratchet-lever 68 is oscillated. When moved forwardly, its pawl 67 slips over the teeth of the ratchet 66, and when moved rearwardly it rotates the clutch member 56, and hence the shaft 55 and drum 54, to wind the cable 50 upon the latter, the teeth of the clutch member 56 slipping over the teeth of the member 57, as will be readily understood by reference to Fig. 1 of the drawings. When it is desired to lower the plow, the clutch-lever 63 is shifted to disengage the member 57 from the member 56, and the pawl 67 is disengaged from the ratchet 66, so that the weight of the plow will rotate the drum 54 and its shaft 55, the movement of the latter-mentioned elements being readily controlled by means of the engagement of the friction brake-band 77 with the wheel 76, as explained.

When it is desired to use the machine for operating a mowing-machine instead of a plow, as previously described, the plow is removed and the necessary parts of a mowing-machine are connected to the frame 1, as shown in Fig. 4 of the drawings. The sickle-bar 80 of the mowing-machine has its pitman 81 connected to a wrist-pin 82, provided upon a crank-disk 84, which is secured upon the forward end of a shaft 85. The latter is mounted in a downwardly and forwardly inclined position in bearings 86, provided upon a bracket 87, which depends from one side of the frame 1. Upon the shaft 85 is secured a bevel-pinion 88, which meshes with the bevel-gear 89, which is mounted to rotate upon a stub-shaft 90, provided in the bracket 87. Secured upon the gear 89 is a sprocket-wheel 91, which is connected by a sprocket-chain 92 to a sprocket-wheel 93, which is secured upon the counter-shaft 30. It will be seen that when the shaft 30 is rotated its movement will be imparted through the gearing just described to the crank-disk 84, so that the cutter or sickle bar of the mower will be reciprocated.

When the mechanism for reaping grain is mounted upon or connected to the frame 1, the elevators and binders thereof may be driven by a sprocket-chain, (not shown,) which may be passed about a sprocket-wheel 94, secured upon the outer ends of the counter-shaft 30, as willl be readily understood.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. A traction-engine having a frame, a driving counter-shaft mounted thereon, a driving axle-shaft, connecting-gears between the counter-shaft and the axle-shaft to drive the latter in either direction without reversing the counter-shaft, each of said connecting-gears including an element loose on the counter-shaft, a clutch member on the counter-shaft to lock either of said loose elements thereto at will, a stub-shaft, a bevel-gear rotatable thereon, driving connections between said stub-shaft and said counter-shaft, a second shaft, a bevel-pinion on the latter engaged with said bevel-gear, and a crank-disk on the second shaft, to operate the pitman of a mowing-machine, substantially as described.

2. The combination of a frame, wheels for supporting the same, means for driving said wheels, a counter-shaft, a bracket upon said frame, a stub-shaft in said bracket, a bevel-gear rotatably mounted upon said stub-shaft, sprocket-chain gearing between said bevel-gear and said counter-shaft, a second shaft, a bevel-pinion upon the latter in mesh with said bevel-gear, a crank-disk upon said second shaft, a wrist-pin upon said crank-disk, a tooth-bar of a mowing-machine, a cutter-bar mounted in said tooth-bar, and a pitman connecting said cutter-bar and said wrist-pin, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DAVID B. ARNOLD.

Witnesses:
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