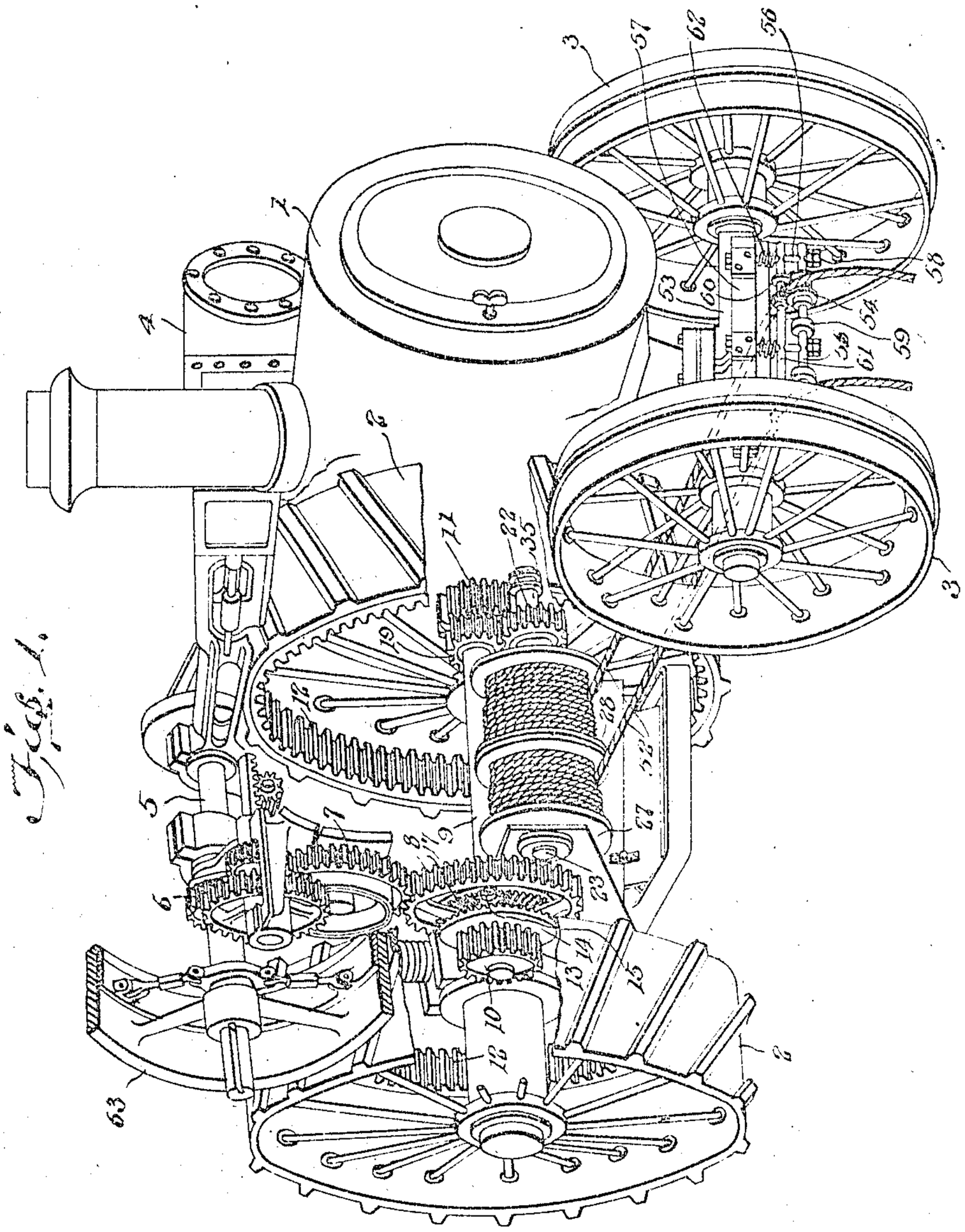
No. 819,226. PATENTED MAY 1, 1906.

C. O. HEGGEM.

TRACTION ENGINE.

APPLICATION FILED JULY 1, 1905.

4 SHEETS—SHEET 1.



Witnesses

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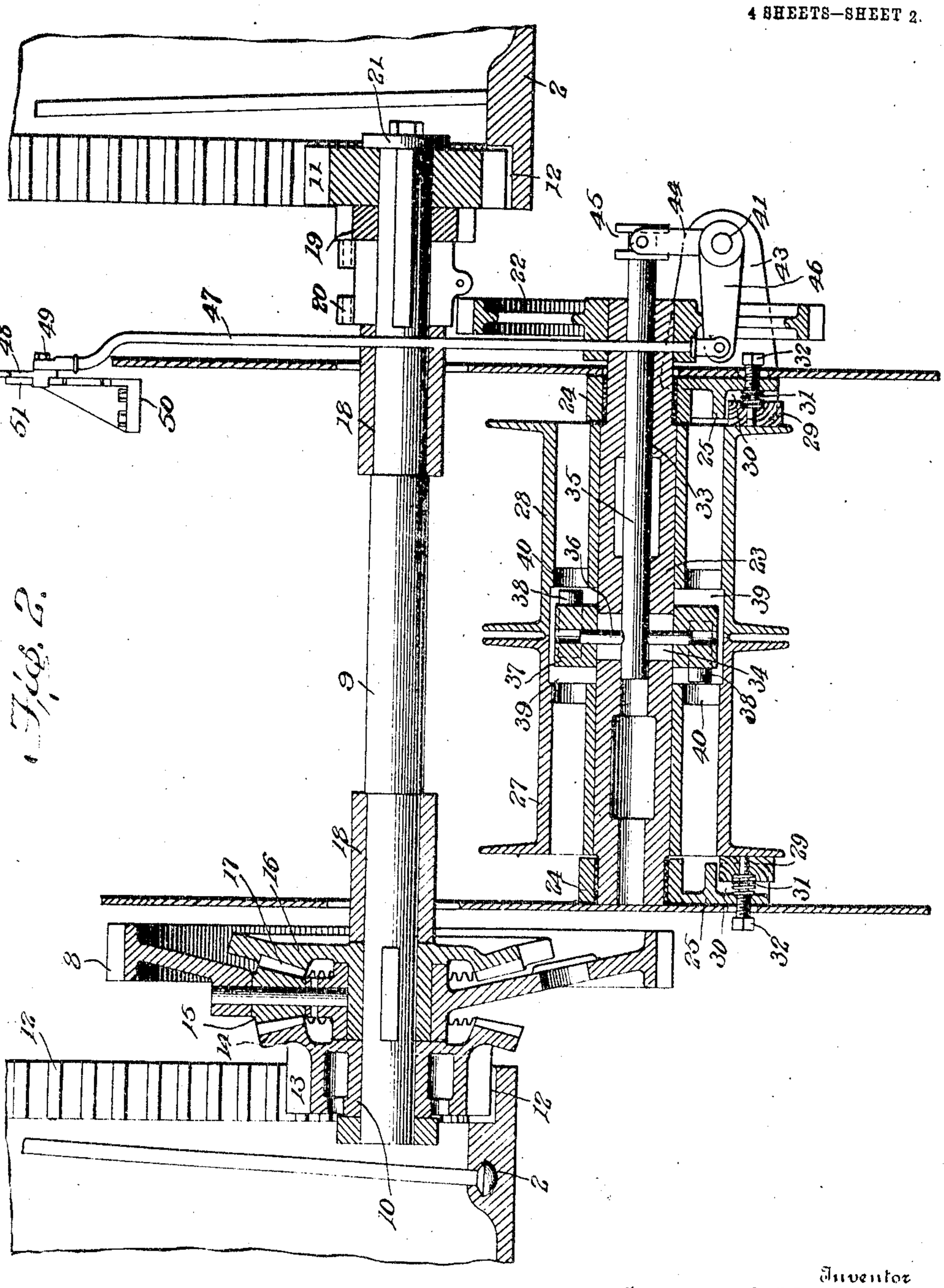

Fig. 2.

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4 SHEETS—SHEET 3.

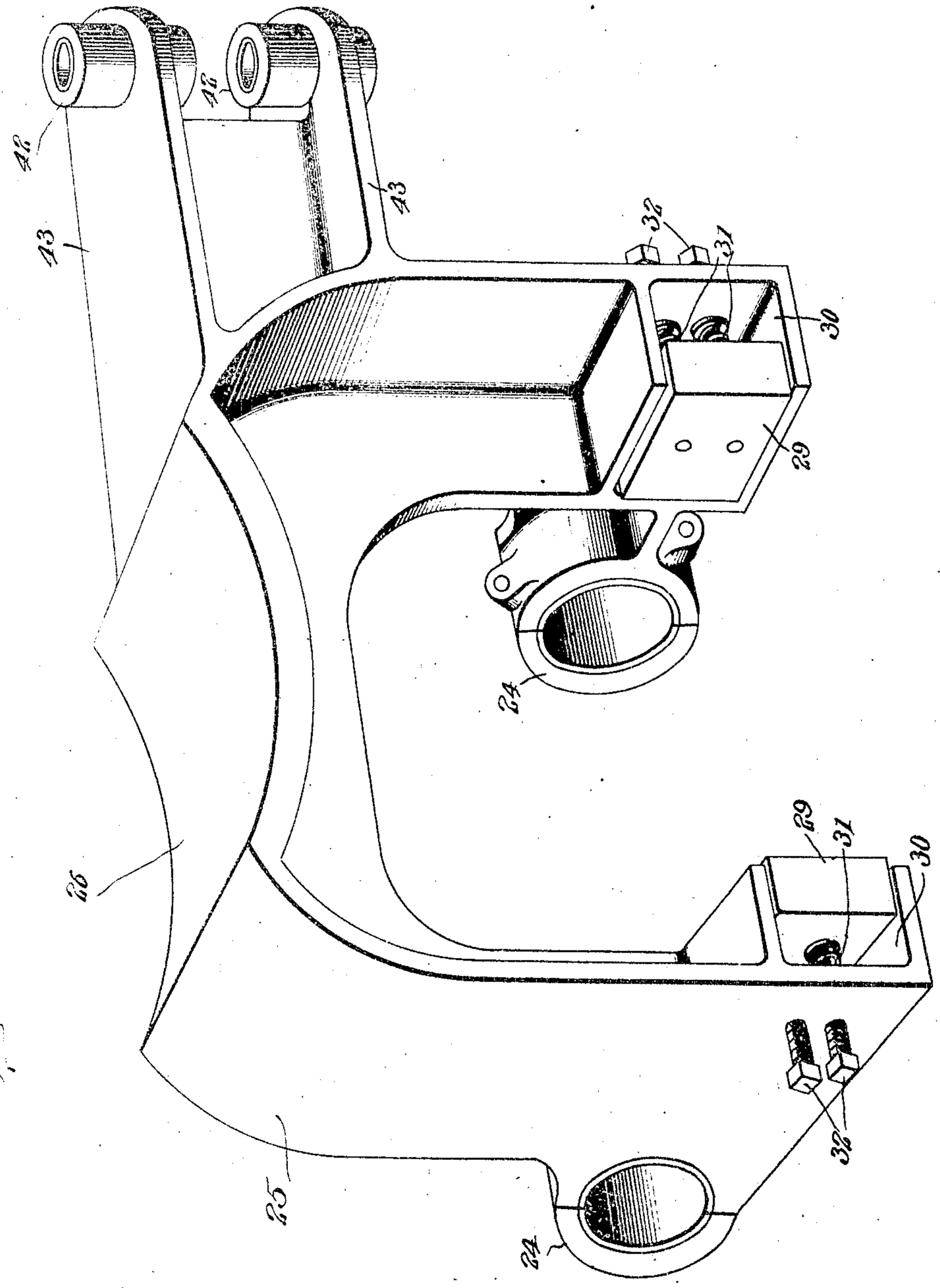

Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 4.

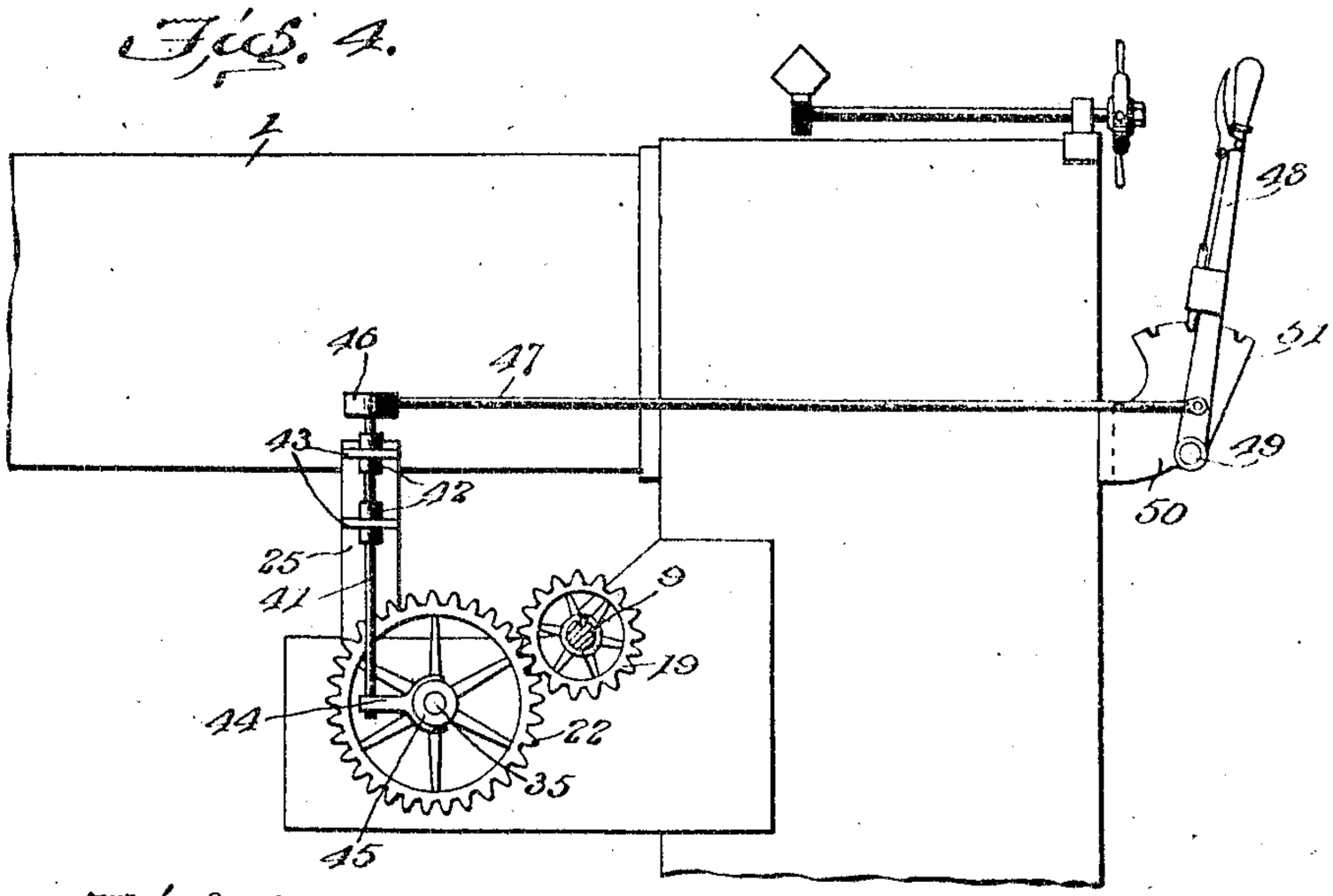


Fig. 7.

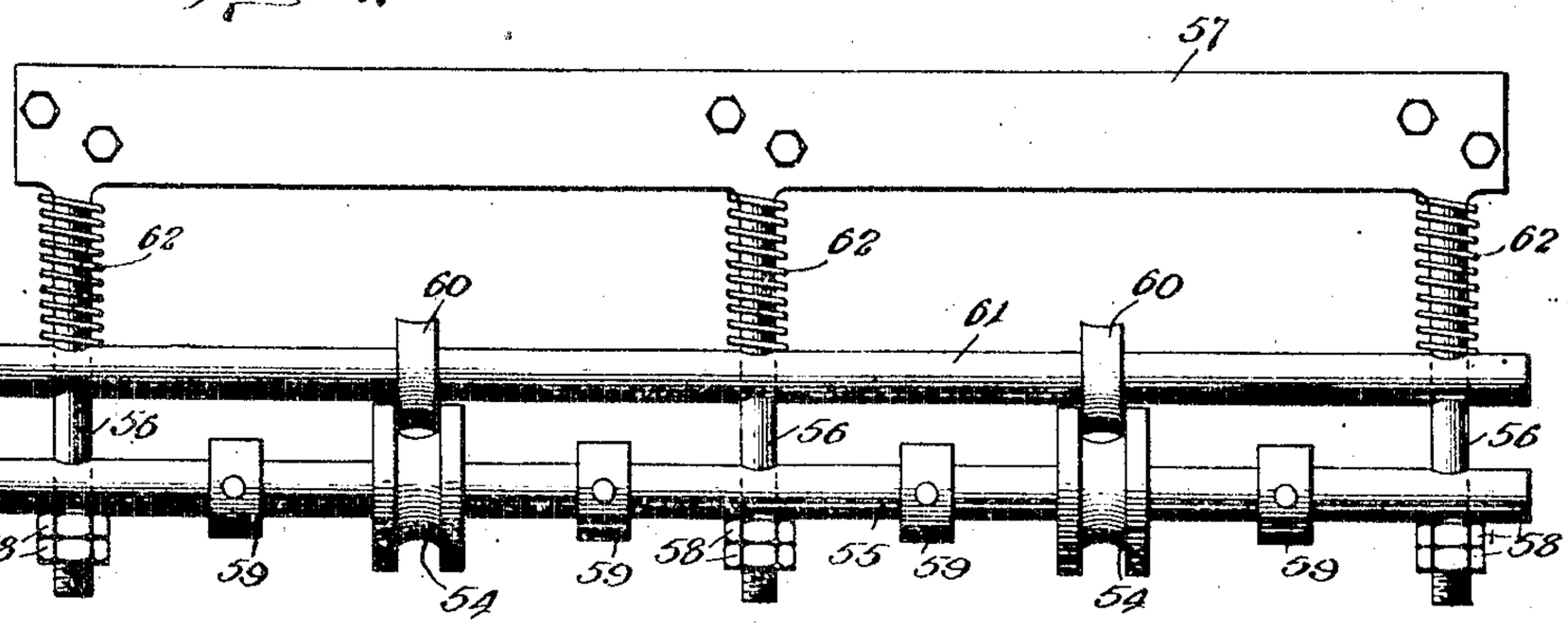


Fig. 6.

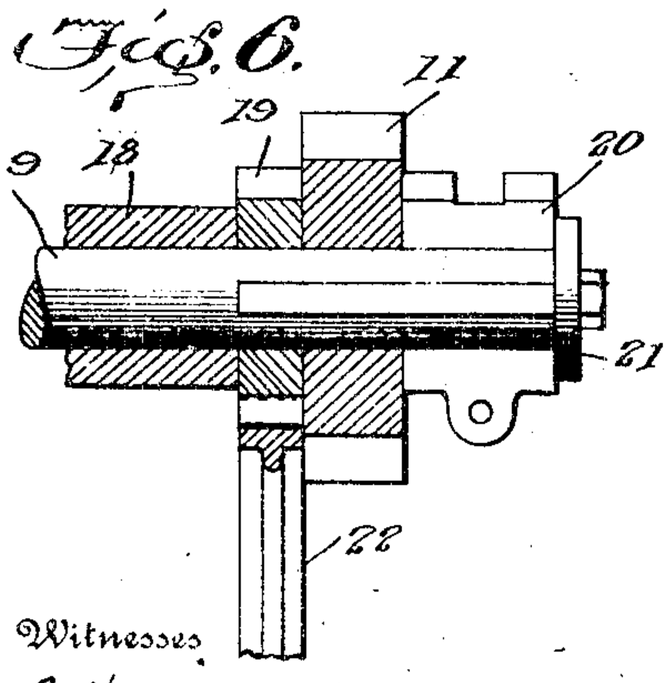
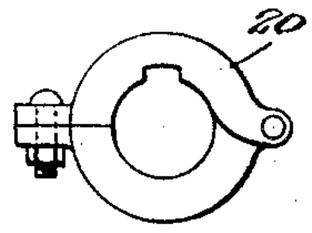


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

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TRACTION-ENGINE.

No. 819,226. Specification of Letters Patent. Patented May 1, 1906.

Application filed July 1, 1905. Serial No. 267,910.

To all whom it may concern:

Be it known that I, CHARLES O. HEGGEM, a citizen of the United States, residing at Massillon, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Traction-Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to traction-engines, and has for its object to provide a self-propelling engine of the type usually used for the purpose of hauling and actuating farm machinery—such, for instance, as threshing-machines—which engine shall, in addition to its usual propelling and power-furnishing or machinery-driving mechanism, be provided with means whereby when the machine as a whole remains stationary in one location it may be used to haul—as, for instance, in drawing plows through the ground, to hoist or drag various articles along the ground, or to do other work which may be accomplished by means of a winding-drum and rope or cable—and whereby when the engine becomes stalled by reason of bad roads or high grades it will be enabled to pull itself along under conditions where the ordinary propelling mechanism would be inefficient. To these ends my invention consists in certain novel features, which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a perspective view, partly broken away, of a traction-engine embodying my invention in one form. Fig. 2 is a horizontal sectional view taken in a plane passing through the counter-shaft and drum-shaft. Fig. 3 is a detail perspective view showing the bracket-casting which supports the drum-shaft and its coöperating mechanism. Fig. 4 is a detail view illustrating the connections between the drum-controlling clutch-rod and the hand-lever whereby it is operated. Fig. 5 is a detail view of the spacing sleeve or collar detached. Fig. 6 is a view of a portion of Fig. 2, showing a different position of the shifting-pinions and their spacing-sleeve; and Fig. 7 is a front elevation of the rope guiding and tensioning devices detached.

In the said drawings I have illustrated my invention as applied to a well-known type of traction-engine, of which 1 indicates the boiler, mounted on driving-wheels 2 and steering-wheels 3 and having an engine 4, by means of which motion is imparted to an engine-shaft 5, which is connected by change-speed gearing 6 and an intermediate gear 7 to a compensating gear 8 on a counter-shaft 9, provided with pinions 10 and 11, which mesh with the internal gears 12 of the driving-wheels 2. These parts may be of any approved construction. In the present instance the compensating gearing comprises the double pinion 10, which is mounted loosely on the counter-shaft 9 and has a spur portion 13 to mesh with the driving-wheel gear 12 and a bevel-gear portion 14, which meshes with the bevel-pinions 15, carried by the main compensating gear 8. This latter gear is mounted loosely on the sleeve-like hub of a sleeve-pinion 16, keyed or otherwise secured on the counter-shaft 9 and having a bevel-gear portion 17, which also meshes with the bevel-pinions 15. The double pinion 10 is always in mesh with its gear 12. The counter-shaft 9 is supported in suitable bearings 18 on the engine-frame, and the pinion 11 is splined upon that end of said shaft farthest from the end bearing the double pinion 10, so that the pinion 11 may be slid longitudinally on the said counter-shaft, so as to be either in mesh with the internal gear 12 of the corresponding driving wheel 2 or to be moved out of engagement with said internal gear. On this same end of the counter-shaft 9 there is mounted a pinion 19, also splined on said shaft so as to be movable longitudinally thereon. This pinion may be made in one piece with the pinion 11, if desired.

20 indicates a spacing sleeve or collar formed in two separable parts hinged together, as shown in Fig. 5, or otherwise made removable from the shaft. This sleeve may be placed between the bearing 18 and the pinion 19, as shown in Fig. 2, in which position of the parts the pinion 11 is in mesh with the internal gear of its driving-wheel 2, while the pinion 19 is out of mesh with its coöperating gear hereinafter referred to. The spacing sleeve or collar 20 may be removed from the counter-shaft, the pinions 19 and 11 being slid inwardly along the same until the pinion 19 is in contact with the bearing 18, and the sleeve or collar 20 may be then replaced upon the shaft between the pinion 11 and the cap 21 on the outer end of the counter-shaft, as shown in Fig. 6. In this posi-

tion of the parts the pinion 11 is out of mesh with its driving-wheel gear, while the pinion 19 is in mesh with its coöperating gear 22. Any suitable means for shifting these gears back and forward may be employed.

The gear 22, which coöperates with the pinion 19, is secured on a drum-shaft 23, which is mounted in bearings 24 in a bracket-casing 25 (shown in detail in Fig. 3) and secured to the under side of the boiler 1 in front of the fire-box, its upper surface being hollowed out or concaved, as indicated at 26, to fit the boiler. The drum-shaft 23 has loosely mounted thereon side by side two winding-drums 27 and 28, which are held against accidental rotation by means of a friction-brake, one for each drum. Each friction-brake comprises a friction-block 29, preferably of wood, mounted in a recess 30, provided for it in the lower end of the bracket-casting 25, said block being backed by springs 31, which force it out against the end face of the corresponding drum and being controlled by set-screws 32. The drum-shaft 23 is hollow, having an axial bore or aperture 33, and its central part is transversely slotted, as indicated at 34.

35 indicates a clutch-rod sliding longitudinally in the bore 33 and provided at its inner end with a transverse pin 36, which extends out through the slot 34 and engages a clutch-sleeve 37, adapted to slide longitudinally on and rotate in unison with the drum-shaft. This clutch-sleeve is provided on its opposite faces with pins 38, which when the clutch-sleeve is central, as shown in Fig. 2, do not engage with either of the drums. The inner end of each drum is recessed to accommodate the clutch-sleeve, as indicated at 39, and each drum is provided at the inner end of said recess with apertures 40, adapted to receive the clutch-pins 38. Thus by shifting the clutch-sleeve 37 in one direction or the other from its central position through the medium of the rod 35 said clutch-sleeve may be caused to engage with either one of the drums 27 or 28, so as to impart movement to the same, while both drums will remain stationary when the clutch-sleeve is in its central position.

The clutch-rod 35 is controlled from a vertical shaft 41, mounted in bearings 42, supported by arms 43, extending laterally outward from the bracket-casting 25. The shaft 41 is provided at its lower end with an arm 44, terminating in a yoke which engages a grooved collar 45 on the projecting end of the rod 35, so that said rod may rotate in unison along with the drum-shaft, while maintaining its engagement with the arm 44. The shaft 41 is provided at its upper end with an arm 46, which is connected by a link or connecting-rod 47 with a hand-lever 48, pivoted at 49 to a bracket 50, supported on the boiler or fire-box. This bracket has the usual locking-quadrant 51, and the lever 48 will be provided with the usual locking mechanism to engage therewith.

Each of the drums 27 and 28 has wound thereon a rope or cable 52, and these ropes or cables are carried forward from said drums under the boiler and under the front axle 53. Here each rope passes over a grooved guiding-pulley 54, mounted loosely on a non-rotating shaft 55, supported on rods 56, extending downward from a plate 57, secured to the front axle-yoke. The shaft 55 is apertured for the passage of the rods 56, which latter are provided with retaining-nuts 58 on their lower ends below the shaft 55, which is free to slide on said rods. Each grooved pulley 54 is not only free to rotate on the shaft 55, but is also free to slide longitudinally thereon to adjust itself to the various positions which the rope 52 may assume, the movement of each guide-pulley 54 lengthwise of the shaft 53 being limited by collars 59, adjustably secured on the shaft 55 by set-screws. In order to hold each rope 52 in position in its grooved pulley 54, I employ guard-rollers 60, one for each pulley and adapted to fit between the guide-flanges thereof. The guard-rollers 60 are loosely mounted on a non-rotating shaft 61, which is mounted to slide on the rods 56 and is normally forced toward the shaft 55 by springs 62, mounted on said rods between the shaft 61 and plate 57. By reason of this construction the guard-rollers 60 are always held in engagement with the guide-pulleys 54, with which they coöperate, while yielding to permit the passage of the rope, and are free to move longitudinally on their supporting-shaft 61 as the guide-pulleys move similarly on their supporting-shaft 55. These pulleys and rollers thus serve to guide the ropes and direct them properly to the corresponding drums, preventing their entanglement with any portions of the mechanism of the traction-engine. They also serve as tensioning devices to insure a proper tension upon the ropes when they are being wound upon the drums, and they may be employed to distribute the coils of rope evenly upon the drums.

From the foregoing description it will be seen that when the parts are in the position shown in Fig. 2 the engine may be used as an ordinary traction-engine, the power being applied to cause rotation of the driving-wheels 2 to move the engine over the ground in the usual way. Of course it will be understood that the engine-shaft may be disconnected entirely from the gearing by means of which it drives the counter-shaft 9 by means of the friction-clutch-driving pulley 63, from which any farm or other machinery may be driven by a belt in the usual manner. When, however, it is desired to use the engine as a hauling-engine, the pinions are shifted in the manner described, so that pinion 19 meshes

with gear 22 and pinion 11 is out of mesh with gear 12. Thereupon the drum-shaft 23 will be rotated from the counter-shaft 9, which in turn will be driven from the sleeve-pinion 16 through the compensating gear 8 and pinions 15, the double pinion 10 remaining stationary from its engagement with its driving-wheel and the counter-shaft 9 rotating in said pinion 10 as a bearing. The drum-shaft 23 being thus driven, either of its drums may be driven from it by shifting the clutch-sleeve 37 by means of the hand-lever 48 and intervening connecting mechanism, so as to engage either of said drums. It will be understood, of course, that the engine proper, 4, is, as usual, a reversible engine, so that the drums may be driven in either direction. When used as a hauling-engine for plowing purposes, both of the ropes or cables will be used simultaneously, passing around a suitably-anchored guiding-pulley at the farther end of the furrow, one rope unwinding freely while the other is being wound upon its drum by the engines and the direction of travel of the ropes and drums being reversed upon the return of the plows in the opposite direction. It will be seen that the drums may be utilized for dragging or hauling any object to which their ropes may be attached, either drum being used at will or both drums being disconnected when necessary. By means of suitable adjunctive devices the drums may be used for hoisting, raising, and lowering and any other work for which a winding-drum may be employed. In case the engine becomes stalled on the road by reason of the grade being too steep or the load too heavy or by the bad condition or inequalities of the road the drum-cables may be led forward and attached to a suitable anchorage and the winding-drums may be employed to haul the engine and its load along in an obvious manner.

I do not wish to be understood as limiting myself to the precise details of construction hereinbefore described, and shown in the accompanying drawings, as it is obvious that these details may be modified without departing from the principle of my invention.

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

1. The combination, with a traction-engine comprising a boiler, an engine proper having an engine-shaft, driving-wheels, and a counter-shaft located below the boiler and driven from the engine-shaft, of a winding-drum also located below the boiler, and means whereby said counter-shaft may be caused at will to drive either the driving-wheels or the winding-drum, substantially as described.

2. The combination, with a traction-engine comprising a boiler, an engine proper having an engine-shaft, driving-wheels, and a counter-shaft located below the boiler and driven from the engine-shaft, of a drum-shaft arranged parallel with the counter-shaft below the boiler, a winding-drum mounted on said drum-shaft, and means whereby said counter-shaft may be caused at will to drive either the driving-wheels or the winding-drum, substantially as described.

3. The combination, with a traction-engine comprising a boiler, an engine proper having an engine-shaft, driving-wheels, and a counter-shaft driven from the engine-shaft, of a drum-shaft arranged parallel with the counter-shaft below the boiler, a winding-drum loosely mounted on said drum-shaft, means whereby said counter-shaft may be caused at will to drive either the driving-wheels or the winding-drum, and means for connecting said winding-drum and drum-shaft to cause the two to rotate in unison, substantially as described.

4. In a traction-engine, the combination, with an engine having an engine-shaft, driving-wheels provided with gears, and a counter-shaft operatively connected with the engine-shaft by a compensating gear and provided with fast and loose pinions respectively meshing with the driving-wheel gears, the fast pinion being movable into and out of mesh with its driving-wheel gear, of a winding-drum, a driving-gear for said winding-drum, and a pinion rotating with the counter-shaft and movable thereon into and out of mesh with said driving-gear, substantially as described.

5. The combination, with a traction-engine comprising an engine proper and driving-wheels, of a drum-shaft, two winding-drums loosely mounted on said drum-shaft and provided with friction-brakes, a clutch member rotating with said drum-shaft and normally out of engagement with both drums, means for moving said clutch member into engagement with either drum exclusively, and means whereby the engine may be caused to drive either the driving-wheels or said drum-shaft, substantially as described.

6. The combination, with a traction-engine comprising a boiler, an engine proper mounted thereon and having an engine-shaft, driving-wheels, and a counter-shaft located below the boiler and having a driving connection with the driving-wheels which may be rendered inoperative at will, of a drum-shaft located below the boiler and having two winding-drums loosely mounted thereon, means for effecting at will a driving connection between said counter-shaft and drum-shaft, and means for connecting either winding-drum with the drum-shaft to impart rotary motion to said drum, substantially as described.

7. The combination, with a traction-engine comprising a boiler, an engine proper

having an engine-shaft, driving-wheels, and a counter-shaft driven from the engine-shaft, located below the boiler transversely thereof and having a driving connection with the driving-wheels which may be interrupted at will, of a drum-shaft located below the boiler parallel with said counter-shaft, means for effecting at will a driving connection between said counter-shaft and drum-shaft, two winding-drums loosely mounted on said drum-shaft, and means for connecting either of said drums with said drum-shaft to impart rotary motion to the drum thus connected, substantially as described.

8. In a traction-engine, the combination, with a counter-shaft from which the driving-wheels are driven, of a hollow drum-shaft mounted parallel with said counter-shaft below the boiler, means for effecting a driving connection between said counter-shaft and drum-shaft, winding-drums loosely mounted on said drum-shaft and having clutch members on their adjacent faces, a clutch member slidably mounted on said drum-shaft between said drums and rotating in unison with said shaft, an operating-rod mounted in the hollow drum-shaft, connected to the central clutch member at one end and extending beyond the drum-shaft at the other end, and operating means connected to said other end whereby the operator can move said central clutch member into engagement with either drum, substantially as described.

9. In a traction-engine, the combination, with a counter-shaft from which the driving-wheels are driven, of a hollow drum-shaft mounted parallel with said counter-shaft below the boiler, means for effecting a driving connection between said counter-shaft and drum-shaft, winding-drums loosely mounted on said drum-shaft and having clutch members on their adjacent faces, a clutch member slidably mounted on said drum-shaft between said drums and rotating in unison with said shaft, an operating-rod mounted in the hollow drum-shaft, connected to the central clutch member at one end and extending beyond the drum-shaft at the other end, and operating means connected to said other end whereby the operator can move said central clutch member into engagement with either drum, said operating means comprising a hand-lever provided with locking devices, a connecting-rod, and an upright rock-shaft having one arm connected with the clutch-operating rod and the other arm connected with said connecting-rod, substantially as described.

10. The combination, with a traction-engine having a winding-drum located below its boiler with its axis transverse thereto, of guiding devices for the rope or cable supported by the front axle of said traction-engine, substantially as described.

11. The combination, with a traction-engine having a winding-drum located transversely below its boiler, of a rope-guiding device supported by the front axle of the traction-engine and comprising a grooved guide-roller free to move in the direction of its axis of rotation transversely to the engine, and a spring-actuated guard-roller engaging the groove of said guide-roller and free to move transversely in unison therewith, substantially as described.

12. A guiding device for use in connection with a traction-engine winding-drum, comprising a support having parallel rods, a non-rotating shaft mounted on said rods, grooved guide-rollers loosely mounted on said shaft and free to rotate and slide longitudinally thereon, a second non-rotating shaft mounted to slide on said rods toward and from the guide-roller shaft, and having loosely mounted thereon guard-rollers adapted to fit within the grooves of the guide-rollers, and springs for moving said guard-roller shaft toward said guide-roller shaft, substantially as described.

13. A guiding device for use in connection with a traction-engine winding-drum, comprising a support having parallel rods, a non-rotating shaft mounted on said rods, grooved guide-rollers loosely mounted on said shaft and free to rotate and slide longitudinally thereon, a second non-rotating shaft mounted to slide on said rods toward and from the guide-roller shaft, and having loosely mounted thereon guard-rollers adapted to fit within the grooves of the guide-rollers, and springs for moving said guard-roller shaft toward said guide-roller shaft, said guide-roller shaft being provided with stops to limit the lateral movement of the guide-rollers, substantially as described.

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

CHARLES O. HEGGEM.

Witnesses:
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FRANK GUDEKOONTZ.